

River development and risk management concept – a tool to enhance coordination on catchment scale in Austria

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ABSTRACT

The objective of the river development and risk management concept (RD-RM/GE-RM) is to enhance the coordination of measures within a river basin. To ensure efficient implementation a strategic EU project (LIFE IP IRIS) was set up to review and revise existing guidelines. Within the project, eight relevant case studies considering different river types were identified. In these regions, the RD-RM concept was applied. The planning process is based on the goals, priorities, and measures of the Flood Risk Management Plan according to the EU Floods Directive and the River Basin Management Plan according to the EU Water Framework Directive. Spatial planning, building regulations, emergency management, nature conservation, and other relevant authorities, stakeholders and affected individuals are involved in the planning process. A RD-RM concept is primarily developed where there is a need for action regarding flood risk management and ecological improvements. In addition to the hazard situation, factors such as the ecological state of the water bodies and framework conditions like land use designations, water rights, etc., are also taken into account. Based on assessments and evaluations, interdisciplinary development goals and integrative measures are determined. These form the basis for subsequent general projects, detailed planning, and ultimately, the implementation of specific measures.

One case study covers the entire course of the Lafnitz river. A special characteristic of the Lafnitz is that it forms the border between two federal provinces in Austria along large parts of its course. Therefore, the close cooperation between the two federal provinces was particularly important in the preparation of the RD-RM concept. The respective results highlighted that local measures are not sufficiently enough to reduce existing deficits (especially in context of erosion and sediment input) and, therefore, a clear need for catchment-based measures and actions. These were tested in the frame of another project called Land4Climate focussing on a close cooperation of the administration with NGOs, the agricultural chamber and private landowners. To learn from other regions in Europe the project Land4Climate was set up under the EU HORIZON funding scheme and implemented in close cooperation with LIFE IRIS project. Focus is given on the fact that climate resilience needs land. Land4Climate, aims to deploy and demonstrate the practical application of nature based solutions (NBS) on privately owned land. By specifically focusing on implementing NBS on private land, the project supports transformative efforts to increase resilience against issues caused by climate change as well as implementing and scaling innovative land policy strategies. The main output of the collaboration of the two projects is to identify options to coordinate EU legislation at one hand and to foster implementation on local level by the service of advisers by NGOs and the agricultural chamber on the other hand. Both projects clearly highlight the effort needed to coordinate on administrative level but also the benefits gained out of that process. Further, results clearly demonstrate that the service by advisors on local level is crucial for implementing measures, especially, for extensive nature-based solutions.

KEYWORDS: EU Water Framework Directive, EU Floods Directive, River development and risk management concept (RD-RM), Nature Based Solutions (NbS), LIFE IP IRIS Project, HORIZON Land4Climate project, case study Austria

1 INTRODUCTION

Water management needs to take care of different or even contradicting interests in river basins. Local, regional, national or even international interests at stake combined with increasing land use pressure on rivers and associated flood plains clearly highlight the need for a catchment-based management approach of planning and implementing measures. These water management interests are on the one hand the establishment, restoration and maintenance of riparian vegetation, riparian buffer strips and connected terrestrial and aquatic habitats and on the other hand the reduction of flood risks through flood aware land use management. Especially settlements, industry and production, energy and agriculture including associated interventions in the surrounding area and the water bodies themselves put pressure on the limited resource of land.

Additionally, issues related to agricultural practices like soil erosion and nutrient pollution need to be tackled. Sound and comprehensive planning is, therefore, needed to achieve best possible solutions by avoiding conflicts in the frame of achieving the goals set by the water policy framework. Restoration to achieve at least a good ecological status of our river systems is key to ensure a broad variety of ecosystem services. They support achieving the goals prioritised in the frame of the EU Water Framework Directive (Web-1) and EU Floods Directive (Web-2). The key objectives of the WFD are set out in Article 4 of the Directive. It requires Member States to use their River Basin Management Plans (RBMPs) and Programmes of Measures (PoMs) to protect and, where necessary, restore water bodies in order to reach good status, and to prevent deterioration. Good status means both good chemical and good ecological status. The EU Floods Directive aims to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. Both directives are implemented in 6-years cycles including a process of reviewing and, if necessary, updating all relevant steps of implementation.

To ensure best possible coordination amongst the two policies catchment-based river development and risk management concepts (RD-RM; Web-3) are implemented in Austria.

2 THE RIVER DEVELOPMENT AND RISK MANAGEMENT CONCEPT

The river development and risk management concept (RD-RM) is an overarching, integrative and catchment-based planning instrument. The aim of this administrative tool is to ensure that planning, measures and activities in the river basin, in particular with respect to flood risk management and river basin management are coordinated for achieving both, the objectives of the Water Framework Directive and the Floods Directive. The RD-RM is generally based on a compilation of existing, standardised data complemented by catchment related surveys. These surveys may focus on different aspects of water management and are agreed within the project set up. Focus might be given on ecologic and environmental aspects, sediment transport or flood risk management aspects. Therefore, the planning instrument serves flood hazard and risk management, as well as river ecology requirements and needs to define coordinated concepts of medium to long-term development goals, key measures and options. The RD-RM planning tool is to be used in Austria also as a funding prerequisite to implement structural and non-structural flood protection measures.

Inherent to the planning process is the incorporation of sectors outside water management. Part of setting up a RD-RM is to coordinate with priorities and goals of spatial planning, building regulation, emergency management, nature conservation, infrastructure, agriculture, forestry, fishery, hydropower, and also local stakeholders with a broad variety. To produce comparable concepts based on standardised data sets for different catchments in Austria the planning process for a RD-RM is standardised. It is divided into three consecutive phases with overarching activities which are shown schematically in Figure1.

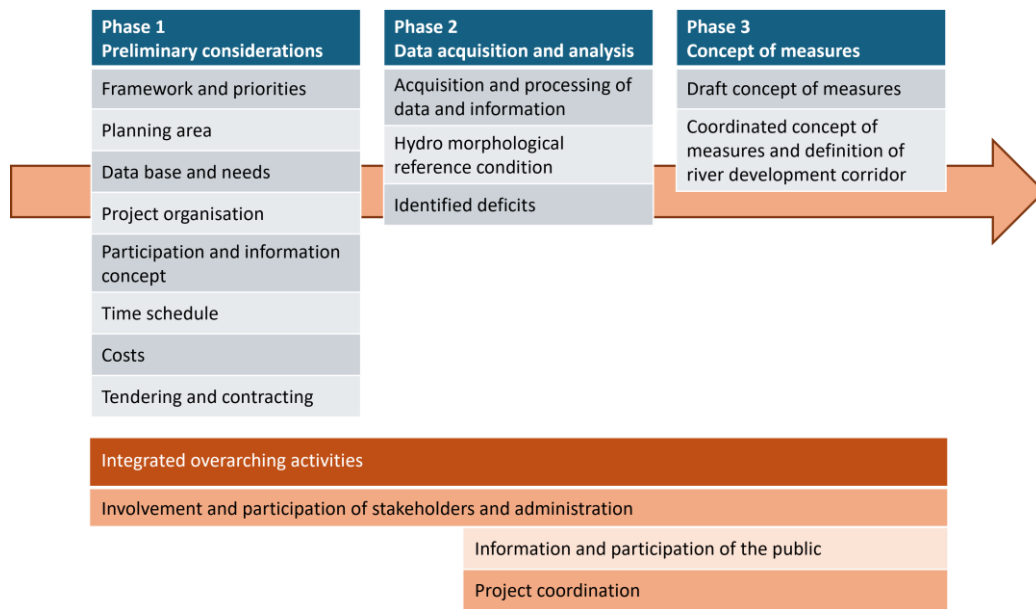


Figure 1: Processes to set up a river development and risk management concept

The three phases are structured in the (1) preliminary considerations, where – thematical – project priorities for the GE-RM are defined and a project structure is created. Missing data is collected in phase (2) data acquisition and analyses, where also the relevant deficits are identified. Finally, a (3) concept of measures is elaborated.

Project management is done by the water management administration on regional level, to ensure a transparent decision-making process in terms of both goal achievements referring to river development and flood risk management. This decision-making process is very much related to the options of measures that are agreed to be relevant, possible and feasible and the respective funding schemes that enable implementation. Thereby, the best possible results are measures serving multiple benefits such as flood retention, hydro-morphological improvement, ecological enhancement, recreation, habitat improvement, etc.

Phase 1 has substantial influence on how relevant stakeholders and affected parties are identified. Based on the thematical priorities a stakeholder analysis is done on regional level on all relevant institutions, stakeholders, NGOs and individuals are invited to participate in the planning process.

Based on preliminary considerations (phase 1) as well as the data acquisition and analysis (phase 2) the river development corridor is derived (Figure 2) as a spatial boundary for further planning. This corridor is based on recently experienced severe flood events as well as on historic data and ecological requirements combined with expert judgement for the final delineation. The corridor, further, serves as communication tool towards the public, land owners and sectors such as spatial planning and building regulation. The corridor is also applied for the delineation of areas for prioritised funding.

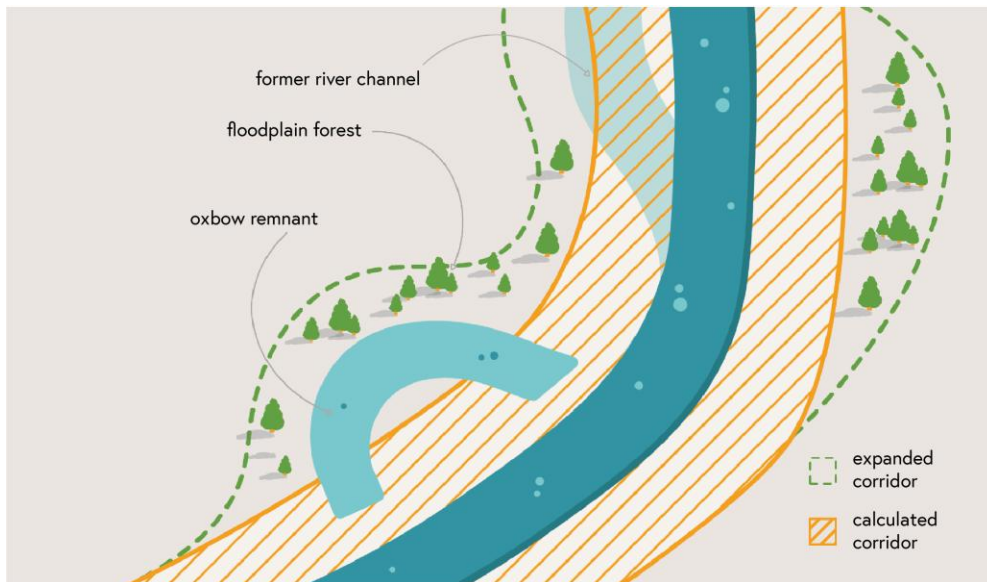


Figure 2: River development corridor as a spatial framework for planning and implementing measures

All planning phases are accompanied by integrated overarching activities to ensure involvement, information, participation and project coordination. Transparent information, communication and participation in decision-making are a central element of modern administrative understanding. For this reason, corresponding processes are also an integral obligation of the RD-RM. To ensure comparable and case-specific but comprehensive processes a guidance document (Figure 3) has been drafted and is applied in the RD-RM setup in Austria.

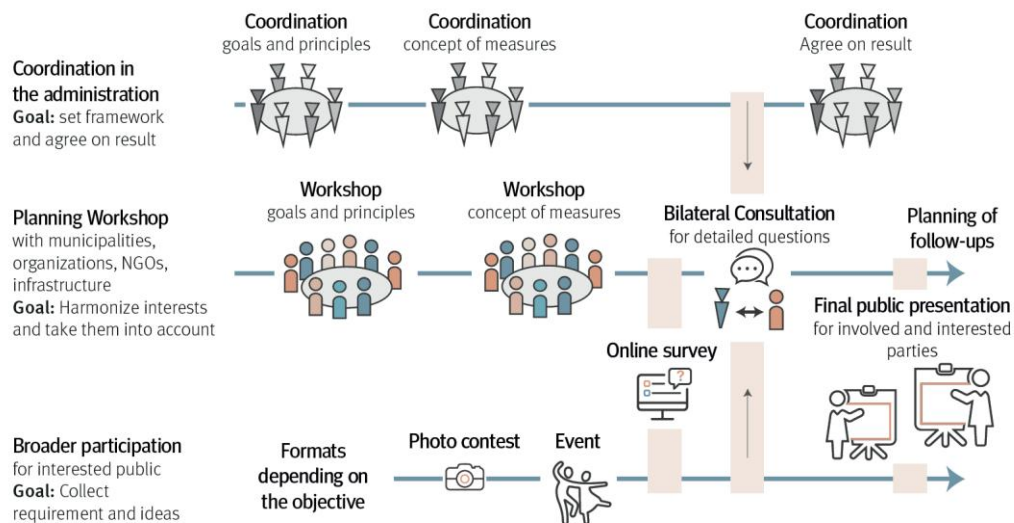


Figure 3: Roadmap for information, coordination and participation in the frame of RD-RM planning

The overall outcome of the planning procedure is a concept for measures providing an overview of measures or bundles of measures to be pursued in the future in order to best achieve the identified goals. In the process of defining relevant measures, a catalogue is used to ensure transparent and comparable planning results throughout Austria. The program of measures takes particular account of the use of synergies between measures for flood risk management and river basin management.

3 THE LIFE IP IRIS PROJECT – REVIEW AND REVISED IMPLEMENTATION OF RD-RM

LIFE IP IRIS – Integrated River Solutions in Austria project (Web-4) applied the RD-RM tool to seven pilot water bodies in Austria (Figure 3). After implementing RD-RM based on the first guidance document, a revision phase was set up to ensure efficient use of financial and human resources combined with an applicable planning tool that can be implemented in relevant catchments across Austria. Special focus was put on the share of administrative responsibilities, additional surveys and framework conditions. Additionally, the project was used to adopt governance practices in association with the RD-RM. For this review and revision phase of the first RD-RM guidance document the LIFE Integrated Project call of the European Commission proved to be the right funding schema.

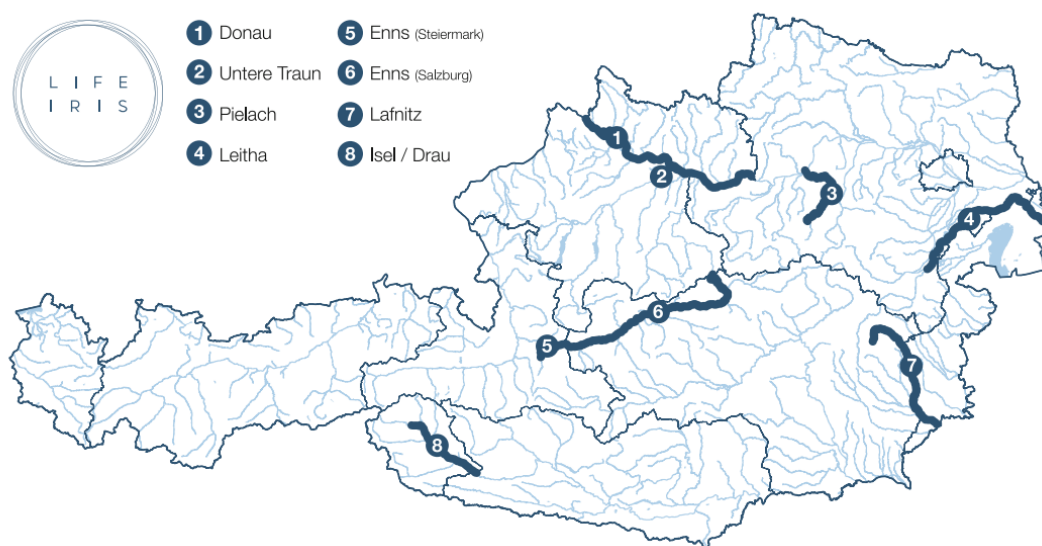


Figure 4: Case study rivers and location of measures of the LIFE IP IRIS project

The project has a total budget of 16.5 million € (EU, national and provincial funds), is being implemented by nine project partners and has a total duration of nine years (2019 to 2027). The first project phase dealt with the review and revision of the RD-RM guidance documents. In addition to strategic planning for the coordinated implementation of the National River Basin Management Plan and Flood Risk Management Plan, as well as the development of coordinated action plans for the IRIS pilot areas, the project also aims to plan and implement specific integrative river engineering projects and comprehensive monitoring of the effects of the measures.

Within the framework of the IRIS project, a monitoring concept was developed that, in addition to considering ecological and hydraulic improvements, also takes into account other effects of the measures, such as the impact on biodiversity and the water cycle and evaluates effects such as ecosystem services, impacts on terrestrial ecology, and the direct benefits that the population can derive from the implementation (sociocultural ecosystem services). Another focus of the IRIS project is capacity building. As part of the IRIS project, the necessary capacities are being developed at the federal and provincial levels. Regular networking meetings provide an opportunity to exchange information on various technical

and organizational aspects of RB-RM planning amongst the participating administrative organizations, sectors, and technical offices involved in the implementation of RB-RMs. This ongoing, open exchange of experiences enables the strengths and weaknesses of the planning instrument in its current form to be identified and solutions to be developed.

The IRIS project aims to raise public awareness that flood protection and river ecology do not have to be contradictory. The involvement of the population, stakeholders and NGOs in the planning process is intended to increase acceptance of the planning results and reduce potential conflicts in the frame of future measure implementation.

4 LAND4CLIMATE - APPLICATION OF CATCHMENT-BASED MEASURES AS A RESULT OF THE RD-RM

RD-RMs are intended to create forward-looking concepts that serve as a “roadmap” for a river basin to achieve the objectives of river basin management and flood risk management. From the perspective of flood risk management, especially under consideration of climate change impacts, the focus has to be on a broad bundle of risk management measures serving multiple benefits. The integration of the population, stakeholders and interested parties into the planning process is intended to increase acceptance for measures beyond flood protection, such as nature-based solutions (NbS, Web-5) and natural water retention measures (NWRM, Web-6), aiming at reducing flood risk and mitigate climate change at the same time. NbS and NWRM provide an important complement to technical solutions, have the potential to support other ecosystem services and promote biodiversity, therefore, having a synergistic effect on water ecology.

NbS and NWRM differ significantly from technical approaches. In many cases, the available instruments, land availability and the willingness of landowners for achieving these benefits are not yet fully developed. Further, there is still scepticism that NbS provide sufficient incentives for owners/users serving as a motivation to implement such measures. To overcome prejudice against NbS and NWRM a pilot project was implemented within the EU HORIZON program. In Austria, the LIFE IP IRIS test case of the Lafnitz river catchment (Figure 5) was chosen as implementation region for the Land4Climate project (Web-7).



Figure 5: Different sections along the River Lafnitz

In the Lafnitz river catchment, the major deficits identified by the RD-RM were related to too high sediment input from agricultural land and missing fish biomass. Thus, several stretches of the river Lafnitz fail the objective of good ecological status. While the RD-RM provides a profound planning basis for flood risk management measures within the river development corridor, the proposed measures within the catchment remain vague and require action from the local land managers. Therefore, the participation in the Land4Climate project is primarily intended to support the implementation of measures for sediment and water retention in agricultural areas outside of the river development corridor. Measures focus on reducing negative impacts of climate change. These measures are area-specific and must be aligned with

existing uses and compensated accordingly. The set of actions mainly includes adjustments in management practices and creation of landscape structural elements. Land4Climate aims to mitigate the adverse effects of flooding, drought, heat, and soil erosion while contributing to a healthy river ecosystem.

5 LESSONS LEARNT AND OUTLOOK

The river development and risk management concepts generate important stimuli for the synergistic implementation of measures in river ecology and flood risk management. The plans support the coordinated achievement of the objectives of the Water Framework Directive and the Floods Directive by tailor made measure implementation. However, after the elaboration of RD-RMs, incentives and framework conditions must be created in order to promote the implementation of the developed measurement concept in the best possible way. Lessons learnt and subjects to be tested and improved can be summarised as follows:

- The application of available legal instruments with focus on securing floodplains and floodplain areas by keeping them free from other land use needs to be strengthened and extended
- Land procurement along and near rivers needs to be done in an anticipatory way to also enable large scale Nature based Solution, Natural Water Retention Measures, restoration and renaturation measures
- Shared responsibilities amongst municipalities in the catchment area, cooperation and ownership need constant administrative support and institutionalisation by establishing water associations.
- Intersectoral coordination and implementation of measures supporting water retention as well as the reduction of sediment and contaminant input need permanent promotion and funding

Particularly with respect to climate induced changes options and measures have to be broadly discussed and evaluated together with all affected sectors and stakeholders that can contribute to achieving a broad variety of goals. Concluding, RD-RMs need to be implemented in a dynamic way to be able to react on all the external developments. Therefore, RD-RMs are set up as an forward looking planning instrument to be adapted, updated, and continued when needed, especially after the implementation of measures or a change in framework conditions.

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Web-7: <https://land4climate.eu/>