"NAture Insurance value: Assessment and Demonstration"

NAIAD

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Glinščica demo

2nd STAKEHOLDER WORKSHOP REPORT

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1 Edition information

Tableau 1: Versions

VERSION	EDITION DATE	MODIFICATION	WRITTEN BY	CONTROLLED BY
1	11-OCT-18	FIRST EDITION	P.PENGAL	R. GIORDANO
2	03-DEC-18	SECOND EDITION	Z.ŠINKOVEC	Z. KOZINC
3	05-DEC-18	THIRD EDITION	B. COKAN	P. PENGAL

2 Summary

The second stakeholder workshop in the Glinščica demo was held at the City Hall of the Municipality of Ljubljana on 10th November 2018. In a series of presentations and interactive sessions, representatives of national institutions and local communities developed different risk management scenarios including NBS measures for the Glinščica catchment and selected the relevant indicators for measuring the scenario effectiveness according to their opinion. Specific barriers to implementation of measures and scenarios as a whole were also identified during the discussion which will be taken into account during valuation and financing steps of the NAIAD project.

3 Table of contents

1 Edition information 3

2 Summary 3

3 Table of contents 4

4 Introduction 5

4.1 Workshop structure 6

4.2 STAKEHOLDER RESPONSE RATE 6

5 Workshop results 8

5.1 Session 1: selection of indicators 8

5.2 Session 2: scenario development 9

5.2.1 Scenario 1 : Renaturation alias Glinščica for all 10

5.2.2 Scenario 2: Bureaucratic 11

5.2.3 Scenario 3: Bottom up 13

5.2.4 Scenario 4: Restoration scenario extended 14

5.2.5 Conclusions of scenario building exercise 15

5.3 Session 3: locating NBS measures 16

6 Conclusions and next steps 18

4 Introduction

The stakeholder workshop in Slovenia was organized on 10TH October 2018 as part of (I) participatory modelling exercise and evaluation methods in WP3 (Task 3.3), led by IRSA (R. Giordano) and (II) valuation of NBS measures and indicators selection in WP4, supported by Zdravko Kozinc (Iskriva). It was organized in close cooperation with associated strategic partner, Municipality of Ljubljana, who cordially agreed to send the invitations to the stakeholders as co-organizers of the event. In addition, the workshop was held at their premises and the co-mayor for urban planning, prof. Janez Koželj, agreed to give a welcome speech. We believe these efforts and support from the municipality's staff contributed to unexpectedly high attendance of stakeholders to the second workshop in the Glinščica catchment.

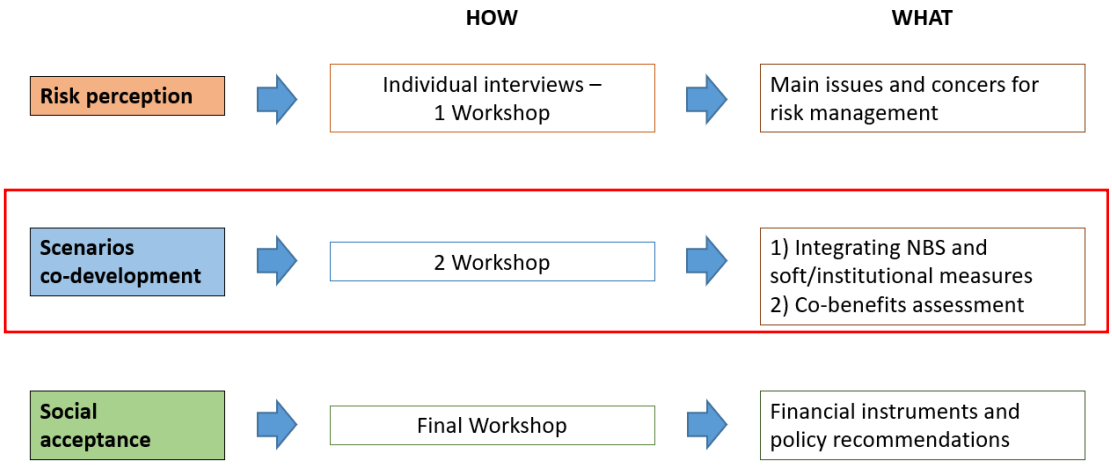

Figure 1: The current stage in the WP3 activities in the Glinščica demo.

The workshop was organized in cooperation among 4 NAIAD partners with differing roles:

- **ISKRIVA** was responsible for the introduction, overall process and the interactive session on valuation and indicators selection,
- **Municipality of Ljubljana** (associated strategic partner) sent the official invitations, made their meeting room available and prepared the opening speech,
- **IRSA** supported the workshop development, provided a presentation on SDM, instructions, materials and expert support and
- **REVIVO** coordinated and led the development of the workshop, arranged the materials, and led the interactive sessions on scenario building and NBS localization.

The preparations started about 5 months prior to the workshop. The first outline of the workshop was discussed during the DEMO meeting in Montpellier in July 2018. It was decided that the workshop should be organized in early autumn and that its main goals will be to define risk management scenarios, based on the integration between NBS and soft/institutional measures, to assess the NBS effectiveness in producing the expected benefits and co-benefits,

and to determine locations for NBS implementation in the Glinščica catchment. In the following months a number of skype meetings were organized between WP3, WP4, WP5 and Glinščica demo team to detail the contents and structure of the WS.

4.1 Workshop structure

A first structure of the workshop developed in a joint skype meeting was further adapted by ISKRIVA, IRSA and REVIVO to include all required topics (Agenda in attachment) through a series of skype meetings.

The interviews, performed prior to the workshop, revealed a knowledge gap in regard to NBS and ecosystem services concepts, so the two initial presentations on this topic were deemed essential for successful implementation of the workshop. The following interactive session aimed at determining the best set of indicators for evaluating NBS effectiveness according to stakeholders' view. The second interactive session was preceded by a short introduction to system dynamic modelling, the steps taken until now and the model developed specifically for the Glinščica catchment. The session itself enabled stakeholders to jointly develop 3 risk management scenarios which were then simulated and their results discussed. To this aim, participants were required to define three potentially suitable risk management strategies, by integrating NBS (I) and soft/institutional (II) measures. These two sets of measures were defined prior the workshop referring to the results of the previously implemented stakeholders' activities.

Finally, the goal of the last interactive session was to determine the best locations of the selected NBS measures in the Glinščica catchment according to stakeholder perceptions. In addition, barriers to implementation linked to these specific locations were noted.

The workshop was held in Slovenian language, except the presentation of system dynamic modelling in the introduction to the second session on scenario development. This presentation gave a short overview of the concept of SDM and the steps of the participative process taken until the workshop. The session was announced in Slovenian language and an inquiry was made among the participants to ensure they all understand English language. Moreover, stakeholders were encouraged to interrupt the presentation and request translation and/or elaboration of any part of the presentation that might not be clear.

4.2 STAKEHOLDER RESPONSE RATE

In total, 33 invitations have been sent out by the municipality and 22 were forwarded to other contacts (55 altogether; Table 1).

Table 1 : Overview of invited stakeholders.

Institution type	Department	Number of contacts
	Sector for nature preservation	2
	Sector for civil protection	1

Municipality of Ljubljana	Sector for spatial planning	1
	Vice Mayor of the Municipality of Ljubljana	1
Governmental institutions	Ministry for agriculture, forestry and food	1
	Ministry for environment and spatial planning, Water and investment directorate, Sector for water protection and use	1
	Ministry for environment and spatial planning, Water and investment directorate, Sector for natural disaster rehabilitation	1
	Ministry for agriculture, forestry and food, Sector for climate change, NGOs, education and accounting	1
	Ministry of defence, Department of protection and rescue	1
	Civil protection administration of the Republic of Slovenia, Department of operations	1
	Directorate of the Republic of Slovenia for Water (Slovenian Water Agency), Sector for development and planning	1
	Institute for Nature Protection of the Republic of Slovenia	1
	Kmetijsko gozdarska zbornica Slovenije - Enota Ljubljana	1
	Zavod za gozdove (Slovenia Forest Service)	1
	Direkcija Republike Slovenije za vode (Directorate for water of the Republic of Slovenia)	2
	Fisheries Research Institute of Slovenia	1
Local communities	Dravlje city district local community	1
	Rožnik city district local community	1
	Vič city district local community	1
	Šiška city district local community	1
Private institutions	Hidrotehnik (Water regulation company)	1
NGOs	Inštitut za politiko prostora (Institute for spatial policy)	2
	Plan B za Slovenijo (Plan B for Slovenia)	1
	Skupnost občin Slovenije (Slovenian Association of Municipalities)	1
	Fishing club Dolomiti	1
	Civil initiative for flood security of SE Ljubljana	1
	Slovenian Association for water protection	1
	Slovenian Association of Insurance companies (forwarded the invitation to their 22 members)	2
University of Ljubljana	Biotechnical Faculty, Department of spatial architecture	1
Total		33 + 22 = **55**

Of the 13 stakeholders participating to the workshop, 8 were representatives of national institutions. Of these, 4 were from the City Municipality of Ljubljana - 1 from Emergency management department and 3 from Department for Environmental Protection and one from each, the National Institute for Nature Conservation, the Slovenian Water Agency, Administration of the RS for civil protection and disaster relief and Fisheries Research Institute of Slovenia.

In addition to national institutions, one representative from each of the following stakeholders was present: a private water management company, the Slovenian Insurance Association, the

Biotechnical Faculty of University of Ljubljana and a local resident. Therefore, all relevant stakeholders were present at the workshop and contributed with their knowledge and expertise.

5 Workshop results

The second workshop in the Glinščica catchment was an important milestone for our demo in which we collected the essential views of the stakeholders to a number of topics that will enable us to continue the NAIAD process in our demo. The workshop was highly successful; all of the most important stakeholders attended the workshop and actively participated in the discussions; and all the required information was collected.

The opening speech was given by the co-mayor of the Municipality of Ljubljana responsible for spatial planning prof. Janez Koželj. He expressed strong support to the NAIAD project, emphasized the challenges the city of Ljubljana has been facing and the barriers he has been experiencing through the years in his position. He found the nature-based solutions a great opportunity for future development, indicated several green infrastructure measures already implemented in the city and indicated national institutional knowledge gap as the main reason for reluctant implementation of NBS in Slovenia in general. Unfortunately, due to this barrier, a number of projects such as NAIAD is currently being implemented only on theoretical level, but he acknowledges that they are essential for bridging the gap and building capacity of the national institutions and hopes they will lay the foundations for future implementations.

5.1 Session 1: selection of indicators

This session was introduced by presentations on successful implementation of NBS measures from around Europe; and the concept of ecosystem services with the role of indicators and how they are generated. The presentations were followed by the first interactive session, the goal of which was to involve stakeholders in co-development of indicators for NBSs evaluation in the Glinščica catchment referring to their own understanding.

After the overview and structure of the session was explained to the stakeholders, **a template** was distributed to all participants and they were asked to fill it in independently. The results were transferred directly into a pre-prepared excel sheet to enable quick overview and aggregation which formed the basis of the following discussion. The discussion was led towards a consensus over the set of indicators for evaluating NBS effectiveness.
In addition to the 13 examples of indicators, that were defined according to scientific literature (EKLIPSE project) and previous interviews, stakeholders suggested a number of innovative indicators to be included in the monitoring:

- Extent of flooded areas
- Retention of driftwood in the headwaters
- Value of damages on public infrastructure
- Value of damage to agricultural areas

- Volume of meteor water discharge
- Water flow speed (in relation to natural)
- Extent of bank vegetation cover
- Extent of urbanized flood plain areas
- Number and extent (number of people affected) of intervention events
- Value of damages to buildings
- Number of visitors to the area
- Extent of recreational areas

For the main and each of the four most important co-benefits, the following three most important indicators according to the stakeholders' opinion were determined:

- Reduction of flood extent:
  - Runoff coefficient in relation to precipitation quantities (mm/%)
  - Flood peak reduction (e.g. Qmax,0/Qmax,1) and increase in time to peak
  - Increased storm water retention (volume)
- Built environment damages reduction:
  - Reduction in human casualties n° or ratio
  - Value of damages on public infrastructure
  - Value of damages to buildings
- Biodiversity and ecosystems state enhancement:
  - Species richness and composition
  - Increased biodiversity
  - Water flow speed (in relation to natural)
- Community safety improvement:
  - Flood peak reduction (e.g. Qmax,0/Qmax,1) and increase in time to peak
  - Extent of urbanized floodplain areas
  - Number and extent (number of people affected) of intervention events
- Social value of ecosystems enhancement:
  - Distribution of public green space – total surface or per capita
  - Improved human health and wellbeing
  - Urban green: index of biodiversity, provision and demand of ecosystem services

These indicators will be used for developing the community-based monitoring system (WP3, WP2), for monitoring and evaluating the NBS effectiveness accounting for the stakeholders' risk perception.

5.2 Session 2: scenario development

This session was started with a presentation on SDM, followed by the description of the exercise and invitation to the stakeholders **to gather around the designated table with scenario boxes**. The aim of this session was to jointly develop 3 scenarios for improved risk management in the Glinščica catchment.

Tables were arranged in an island form so that participants were able to gather around them and three sets of cards with the selection of NBS and soft measures were arranged on the table so that all stakeholders had access to them. Simultaneously, **forms** were distributed with the list of these same measures to ensure all participants had a reference. A basket was put in the

middle of the table to represent the scenario and stakeholders were asked to select the actions from the list of green and soft solutions (list 3 and 4 in the appendix) derived from the previous activities. Participants were required to agree on the combination of green and soft actions for each scenario with at least 1 NBS measure and at most 5 measures altogether. Facilitator supported the discussion and selection of measures and ensured that participants named each scenario once the measures had been selected.

5.2.1 Scenario 1: Renaturation alias Glinščica for all

The first scenario, named **Renaturation** alias **Glinščica for all** included 3 NBS and 2 soft measures:

- ✓ Retention areas effectiveness
- ✓ River renaturation with re-meandering
- ✓ Wetlands restoration
- ✓ Physical risk assessment infrastructure maintenance
- ✓ Funding opportunities for infrastructure

This scenario was later also selected as the most efficient and preferred. Participants felt that the NBS measures are the concrete physical measures that would restore the currently, due to technical measures, degraded stream and that these measures and this scenario is the only one that would raise flood safety as well as recreational value of the area. In addition, the NBS measures are easier to maintain and bring more natural ecosystems to the area, ensuring higher biodiversity and more green areas for the city of Ljubljana in its urban environment. The stakeholders also noticed that the simulation results (Figure 2) for this scenario do not include enhanced flood protection and believe the model is wrong in this respect.

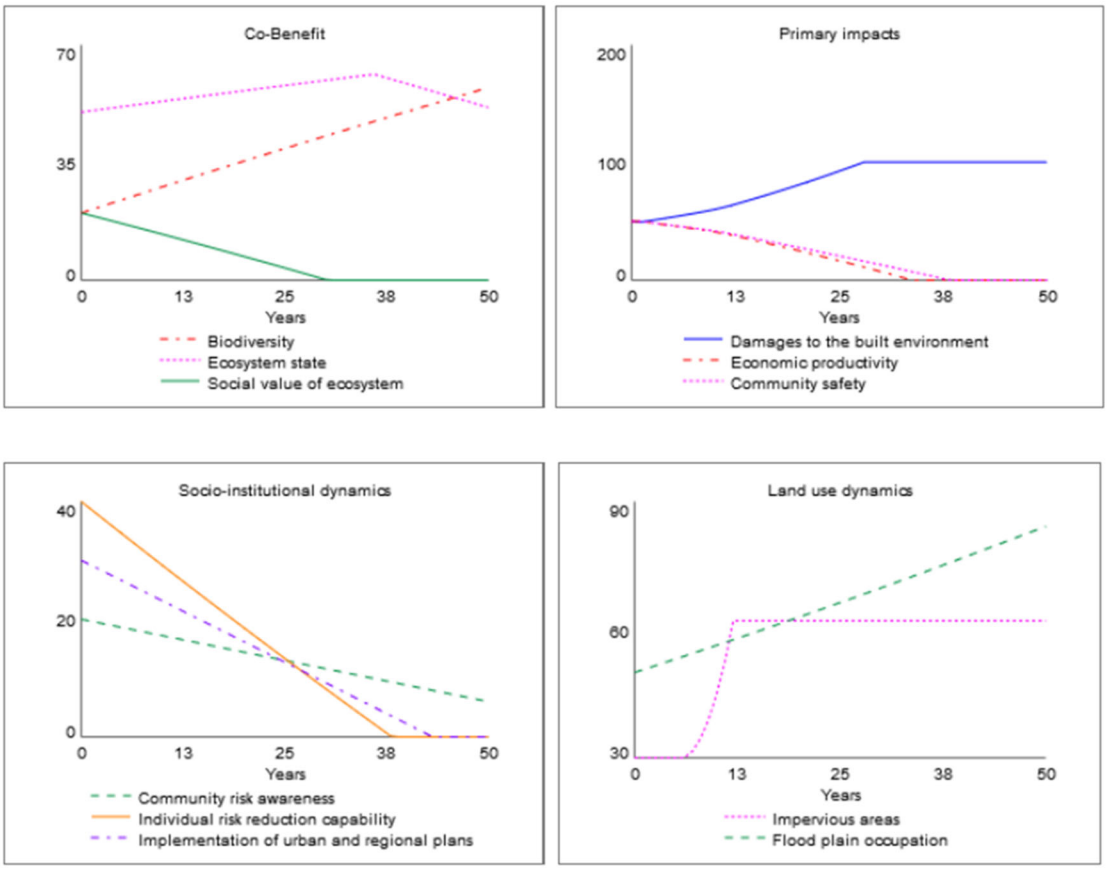

Figure 2: Renaturation (Glinščica for all) scenario simulation results.

The comparison between the Business-as-usual (BAU) scenario and the graph in figure 2 allows us to assess the effectiveness of the selected strategy in producing the benefits and co-benefits. Concerning the reduction of the primary impacts (benefits), the combination of NBS and soft solutions will produce a limited reduction of the effects on the community safety and building damages. The most positive impact regards the state of the ecosystems and the level of biodiversity. In addition, the individual risk management capability will increase.

5.2.2 Scenario 2: Bureaucratic

The second scenario, named **Bureaucratic** included only 1 NBS and 4 soft measures:

- ✓ Opening floodplains
- ✓ Territory control
- ✓ Community involvement
- ✓ Monitoring and warning system effectiveness
- ✓ Insurance policy effectiveness

Scenarios 2 and 3 ranked the same according to stakeholder opinion, both cumulatively, as well as individually, since most of the stakeholders had difficulty deciding which of these two scenarios to rank higher. The most important benefits of the second scenario according to

stakeholders were its long-term effectiveness and enabling effect for implementation of physical restoration measures. On the other hand, stakeholders commented that it is not clear or believable that soft measures without concrete physical changes in the catchment could actually have an effect on flooding damages. It is believed that the suggested measures are solving future challenges, without important impact on current situation. In addition, some stakeholders found it interesting that damage reduction benefits the most from this scenario, since people forget about flood events very fast and so the measures could be effective only on a short time scale, while others thought these measures would be efficient in achieving the paradigm shift in the local population. There was one stakeholder that found this scenario the most important due to its effects on people's perceptions, which are believed to be the most important factor of ecosystem/water management.

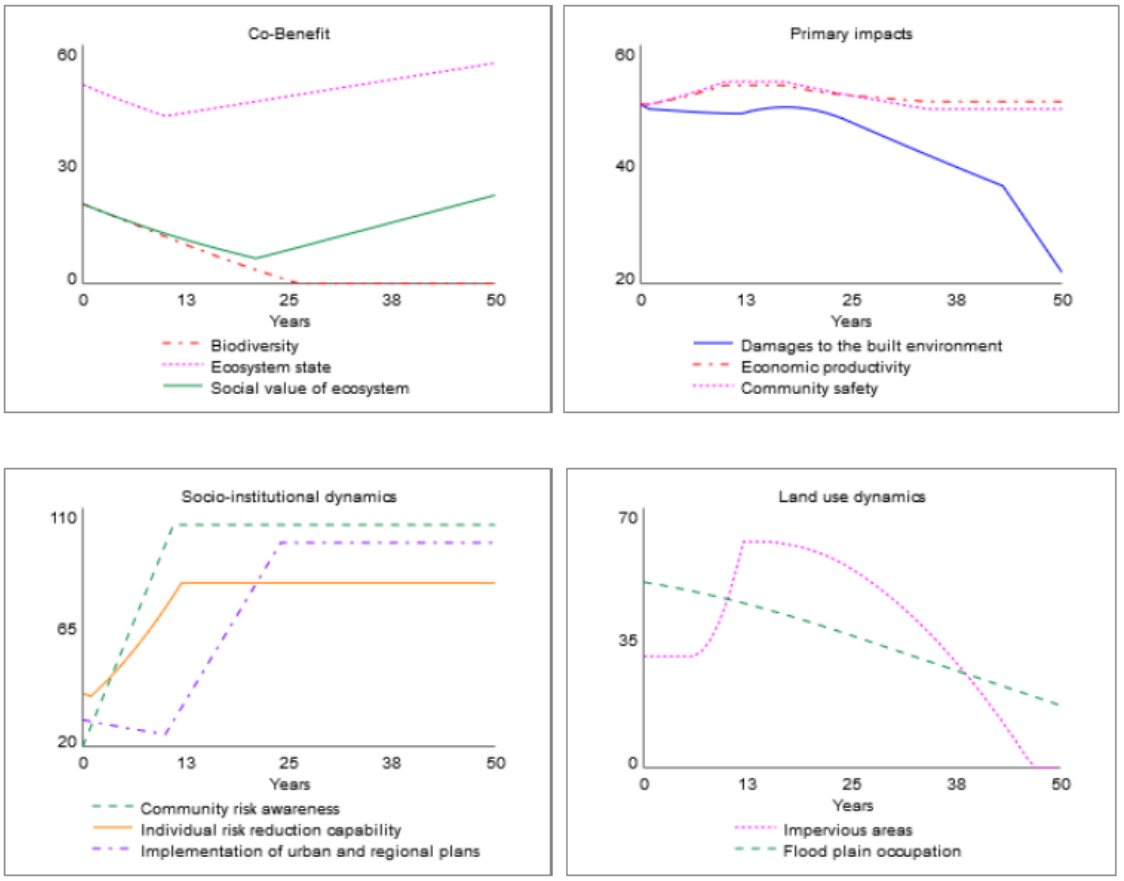

Figure 3 : Bureaucratic scenario simulation results.

This scenario is characterized by an increase of the socio-institutional benefits due to the implementation of the selected strategy. Specifically, the increase of the community risk awareness, due to the increased community involvement, has a positive impact on the implementation of the urban and regional plan as well. Moreover, the positive impacts in the land use dynamics – i.e. flood plain occupation and impervious areas – will lead to a decrease of the building damages. Finally, the social value of ecosystem and the biodiversity will be positively affected.

5.2.3 Scenario 3: Bottom up

The third scenario, named **Bottom up** again included only 1 NBS and 4 soft measures:

- ✓ Retention areas effectiveness
- ✓ Community involvement
- ✓ Institutional cooperation
- ✓ Training
- ✓ Funding opportunities for IRR

The least amount of comments was available for this scenario from the stakeholders, but it was recognized as very similar to the bureaucratic one. While it was recognized as effective on the long run due to its enabling effect on implementation of other measures, it was also suggested by the stakeholders that it might be less effective as the other two scenarios, since it only has indirect impacts on flood safety. The most important measures recognized in this scenario according to stakeholder opinion were financing and awareness raising, which would lower the pressures/unregulated exploitation of the catchment and thus benefit the environmental and social values both among the general population as well as planners and decision makers.

The most important challenge of this scenario was expressed as inefficiency of the national institutions to implement coherent, integrated and wholistic processes of spatial planning, which is required for successful environmentally friendly, sustainable spatial management.

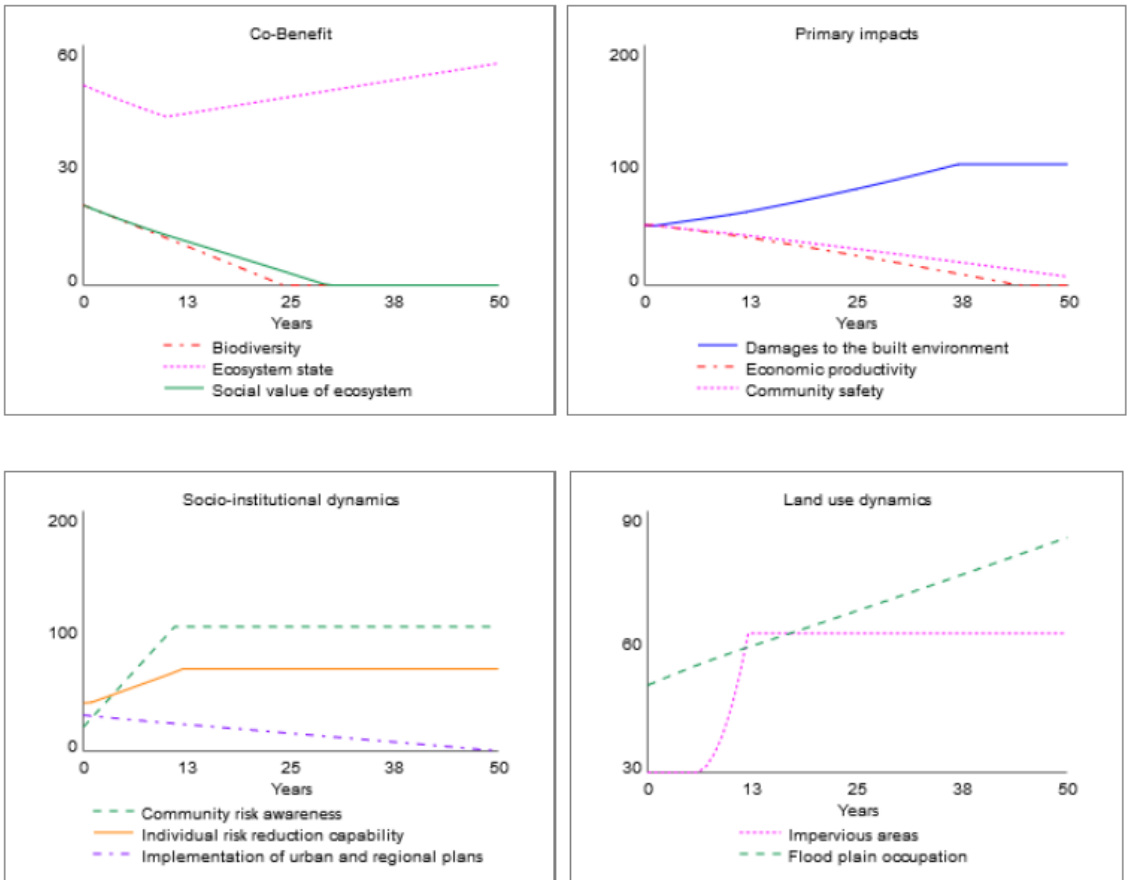

Figure 4 : Bottom up scenario simulation results.

This scenario is characterized by very few NBS, therefore the most important impacts are those related to the socio-institutional dynamics. Nevertheless, those measures have a limited impact on the primary impacts, provoking a reduction of the speed of the damage process, but not on actual reduction.

5.2.4 Scenario 4: Restoration scenario extended

Finally, the workshop participants expressed their disagreement with having a restraint of 5 measures per scenario and requested to further develop the highest-ranking scenario by including additional soft measures that they believe should be implemented simultaneously with the proposed NBS measures to achieve the target benefits and co-benefits in the long term.

Therefore, development of an additional scenario was allowed by the facilitator without constraints to give participants more freedom in selection of measures. As a consequence, this Renaturation scenario was expanded with 7 additional soft measures and was according to stakeholder opinion the scenario that would achieve the set goals for the Glinščica catchment. It is clear from the list below that all soft measures were included in this "best" scenario:

- ✓ Territory control
- ✓ Community involvement

- ✓ Institutional cooperation
- ✓ Training
- ✓ Funding opportunities for IRR
- ✓ Insurance policy effectiveness
- ✓ Physical risk assessment infrastructure maintenance
- ✓ Monitoring and warning system effectiveness

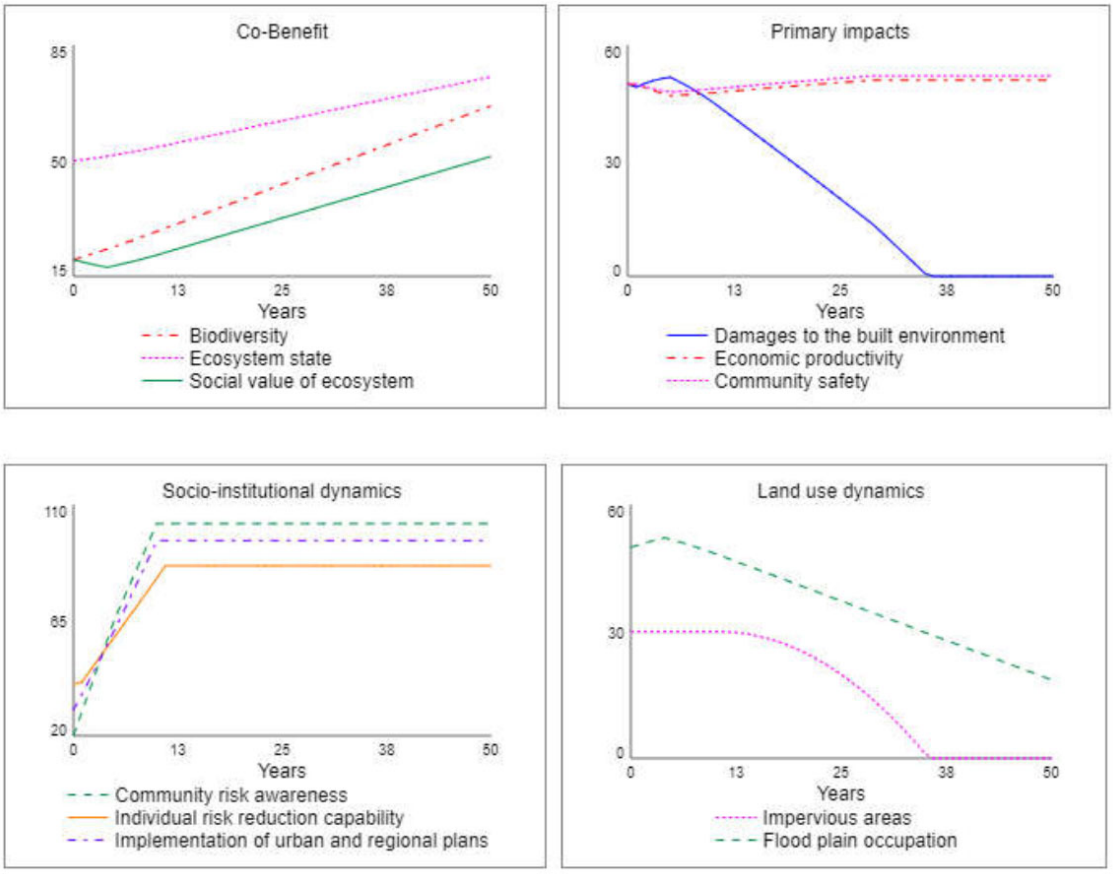

Figure 5: Restoration scenario extended simulation results.

As expected, this is the scenario with the most effective impacts on both benefits and co-benefits. Nevertheless, as already stated by the stakeholders at the end of the WS, a detailed analysis of the costs due to the implementation of these measures is required.

5.2.5 Conclusions of scenario building exercise

The main result of this phase of the WS was to make the participants aware of the need to integrate different kinds of measures in order to enhance the effectiveness of NBS in producing benefits and co-benefits. Specifically, stakeholders became aware of the role played by the soft/institutional measures capable to enhance the effectiveness of the urban and regional plan for implementation. The next phase of the stakeholders' activities in the demo will concern the definition of the costs for the implementation of the selected NBS and soft/institutional measures.

5.3 Session 3: locating NBS measures

The aim of this session was to collect stakeholders' opinions on the best potential locations for implementing selected NBS and the barriers to their implementation through **a group discussion** facilitated by an expert from REVIVO. Therefore, considering the first 3 NBS selected during the scenario development session and given a map of the Glinščica catchment, participants as a group were requested to specify 1) possible locations of each NBS in the catchment and 2) barriers and possible issues that need to be addressed in order to enable successful implementation of measures at each location.

During the first part of this session, stakeholders were asked to indicate the most suitable locations for the three NBS measures that had been selected during the scenario development session:

- opening of the floodplains/creation of wetlands,
- river renaturation with re-meandering,
- creation/increase efficiency of retention areas

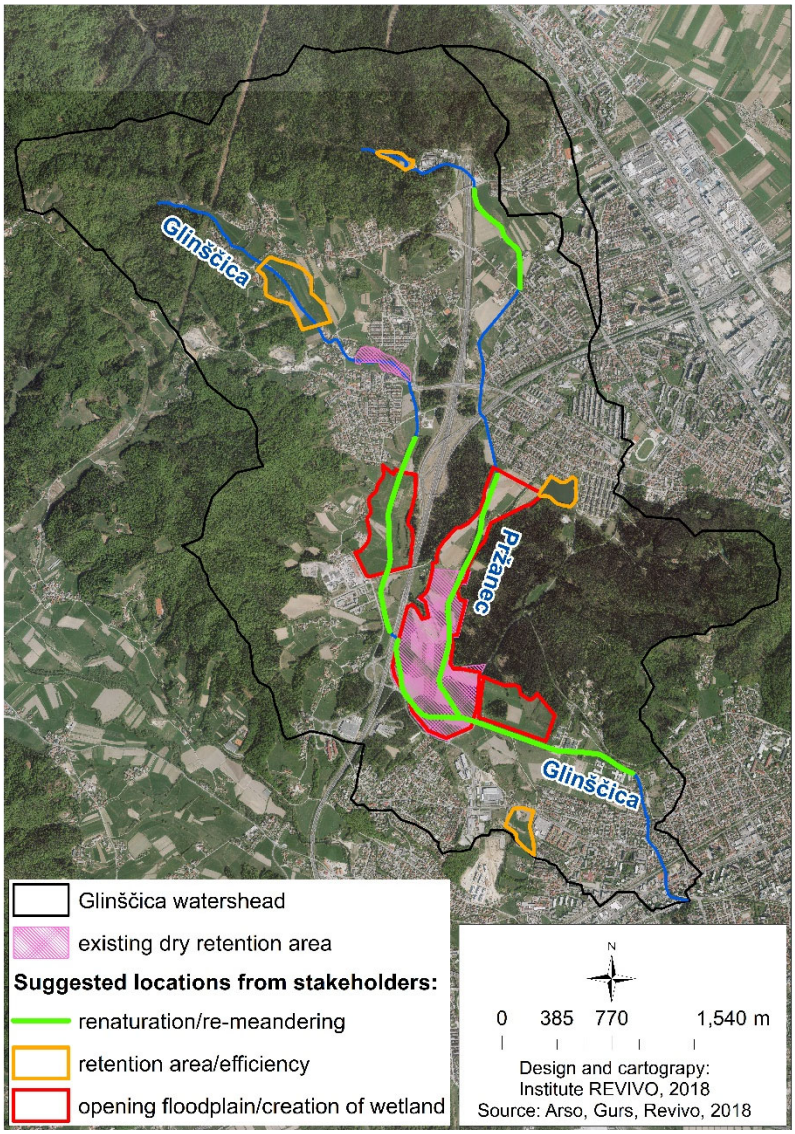

Figure 6: Locations of selected NBS measures in Glinščica catchment according to stakeholders' opinion.

As seen from Figure 6, stakeholders chose the locations of NBS measures mainly outside and upstream of the main settlement areas. Since all selected NBS measures require a lot of space, stakeholders chose the flat and wide areas where such measures could be implemented. Consequently, all locations coincided with the agricultural areas used as fields, intensive meadows or pastures, where the NBS measures can most easily be implemented in their opinion. In general, all stakeholders agreed with the locations and no major disagreements appeared during the session.

According to stakeholders' opinion, the most significant barrier to implementation for all the three NBS measures was finding agreement with the land owners, cultivating the agricultural land. In addition, for the river renaturation/re-meandering measure they also expressed the fear

of potential groundwater level decline in the area and formation of new flood areas upstream of the restored area.

6 Conclusions and next steps

A short summary of the WS activities and results was presented in the conclusion of the WS and stakeholders were asked to express their individual satisfaction with the workshop – on one post-it they had to write one thing they learnt in the WS and 2) one thing they would like to do before/at the next workshop. With this task the WS was closed.

Most of the stakeholders found the workshop interesting and informative and indicated both, their wish for more opportunities for institutional cooperation such as this workshop, and the satisfaction with the process and results of the workshop.

Due to the high diversity of the stakeholders' professional backgrounds, the list of new knowledge gain is also diverse, ranging from cooperation and interdisciplinarity, through modelling and the modelling results with prediction of impacts and importance of soft measures, to new information about the Glinščica catchment.

In accordance with the introductory part of the WS and the future steps of the NAIAD project presented at the WS, the stakeholders expressed the most interest in performing the economic valuation of individual measure and seeing the results – economic effects of the measures, investment costs and financial efficiency of measures. The second important topic suggested for our future work was to develop a proposal for optimal Glinščica catchment restoration and management plan using NBS, with concrete and complex measures for individual parts of the stream presented (implementation plan). One stakeholder also requested to see the grey solutions for the selected NBS measures at the next workshop.

Finally, most of the stakeholders inquired about the future steps of the NAIAD project in the demo and expressed their willingness to participate in the final workshop.