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Foreword

“SketchMatch – ‘SchetsSchuit’ in the Dutch language – is a new concept in Romania to work out solutions for spatial problems and organize public participation.

Romania’s first SketchMatch, held in June 2009 in the Cat’s Bend area, brought together all stakeholders involved in the field issues on the river Danube. They participated in a three-day design session, with the aim to work out solutions for water management problems in this area.

Public participation ensures the involvement of all interested parties within the river basin. In the Cat’s Bend case, this led to the identification of good and integrated measures, based on the so-called ‘Room for the River’ approach. Stakeholders’ involvement in decision-making processes is perceived differently by people and depends on the objectives of the process in this project. Because the stakeholders were identified correctly and only the relevant persons participated in this exercise, the Sketch Match for Cat’s Bend was a successful project.

Each stakeholder drew on the map the possible solutions for the Danube river, according to her/his views and interests. In this way, all participants contributed to the final hydrographical concept, in which different viewpoints were integrated. They enabled the project partners to develop the necessary measures for a better river management - technical, organizational, and/or financial – depending on the situation.

I believe that the Sketch Match process represents a good example of co-operation between the Romanian and Dutch teams, through experts’ involvement from both sides. This is the reason why I think that the project Room for the River Danube in Cat’ s Bend, Romania is a true success!”

Carmen Neagu

General Directorate for Water Management
Ministry of Environment
Romania



1 INTRODUCTION AND PURPOSE

From 22 till the 24th of June 2009, 45 participants gathered at the Internatul Liceului Teoretic Gheorghe Murgoci in Macin, for a three-day workshop focussed on water management issues in the Cat's Bend area along the Danube river (in Galati and Tulcea prefects, East-Romania). Participants were representatives of a wide range of Romanian stakeholders, varying from local farmers to representatives of the County Councils and the Romanian Ministry of Environment. The representatives had the assignment to work out possible solutions to water management problems in Cat's Bend area.

A Romanian - Dutch project team organised and facilitated the workshop, using a method called 'SketchMatch'. The SketchMatch is an interactive spatial planning method developed by the Dutch Government Service of Land and Water Management (DLG) (see textbox 'SketchMatch method' page 7). The objective of a SketchMatch is to work out solutions for spatial issues in a specific region.

During the Cat's Bend workshop, participants developed a range of potential solutions for the project area. Among these was the concept of 'Canulul Ciulinet'; a new watercourse to be developed in connection to the Danube River. This and other concepts are described in Chapter 4 of this booklet. To test these solution concepts, a hydraulic model was used to calculate their probable effects on the Danube water level.

Contrary to the scepticism and reserve that was met at the start, the SketchMatch workshop proved to be a successful and useful method. Participants were enthusiastic about its results. It opened up new directions for solutions to the area, which can be explored further in the future. One of the Romanian project-team members stated: "The SketchMatch has a very strong utility in the spatial planning domain. It helps in our field of work to find new relations between the components of the socio-economic and the ecological system."

Purpose

This booklet briefly describes the SketchMatch process and results. It also contains a short reflection upon the usefulness of the SketchMatch method for other projects in Romania and recommendations how to build further on the SketchMatch's results. For a more detailed description of results and materials used, we refer to the CD-ROM annex of this booklet. In case the CD-ROM is not included in this brochure, a copy can be ordered at Danube Delta National Institute: office@indd.tim.ro or at Government Service of Land and Water Management DLG the Netherlands: sketchmatch@minlnv.nl.

"The SketchMatch has a very strong utility in the spatial planning domain. It helps in our field of work to find new relations between the components of the socio-economic and the ecological system."



project area (map source: Google Earth)

2 PROJECT HISTORY AND CONTEXT

Project history

In 2006 and 2007 first contacts were established between DLG and the Romanian Ministry of Environment, Danube Delta National Institute (DDNI), World Wildlife Fund Romania and Eco-Counselling Galati. Out of these contacts grew the idea for a water project in the Cat's Bend area. At the same time, the Romanian Ministry of Environment commissioned Apele Romane (Romanian Directorate-General for Water Affairs) to carry out the so-called REELD study; a study aimed at determining which strategy is needed for flood protection in the Danube Delta region and to provide better insight into the Danube Delta region.

The Cat's Bend area was chosen as project area, in consultation with the Romanian Ministry of Environment. Cat's Bend repeatedly suffered large flooding and has to cope with severe water management problems, because the natural watersystem has been thoroughly altered in the recent past.

With the REELD study as a starting point, DLG drafted a first project proposal for the project 'Room for the River in Cat's Bend Romania' in December 2007. This proposal was submitted for funding to the Dutch 'Partners for Water' program (see text box Partners for Water program).

The project's original focus was on developing flood protection scenarios for the area, together with stakeholders, using the Dutch 'Room for the River' approach. The basic principle of this 'Room for the River' approach is that, instead of raising the level of dikes, flood protection can be realised more adequately by creating more room for the river. For example by moving dikes further inland or by restoring parts of the former river floodplain. Thus, capacity for water storage and drainage is increased and might be combined with other functions like irrigation, nature-development and restoration of fishing grounds. In the Room for the River toolbox, a short overview of applicable measures is presented (see CD-ROM annex).

Partners for Water program

Partners for Water is a government-funded program, which aims to strengthen the international position of the Dutch water sector, by uniting forces (private sector, public sector, non-profit sector and knowledge institutes). Public-private cooperation can give a powerful impulse to the water sector by developing innovative solutions for the world's water problems. The programme runs from 2005 to 2009 and consists of the following components:

- Policy alignment between departments of the Dutch government
- Cooperation between government, companies, knowledge institutes and NGOs through network meetings and information exchange
- Funding of international water cooperation projects

Focus shift

The original project goal was to develop flood protection scenarios for Cat's Bend. But during the project a shift was made towards a more multi-disciplinary approach including also aspects such as regional economic development and improvement of microclimate (coping with droughts and high temperatures).

It was an important result of this project that these aspects proved to be just as relevant -if not more- to water management solutions, as the initially defined aspects of flood protection. This conclusion resulted from the interactive method of the SketchMatch, in which different stakeholders jointly analysed actual problems and thought out possible solutions.

SketchMatch method

The SketchMatch is a workshop method developed by DLG and works as a 'creative pressure cooker'. During a minimum of 1 to a maximum of 3 days, a group of stakeholders (for example citizens, policymakers, farmers) come together to analyse, define and work out solutions to a spatial problem. The strength of this method is that these analyses are done collectively. A SketchMatch is facilitated by a process supervisor and one or more landscape architects, who visualise problems and solutions by sketching them out on maps. Various disciplines come together in a SketchMatch: spatial design, GIS, ecology, hydrology, hydraulics, cost estimation, etcetera, depending on the nature of the project and issues involved. The result of a Sketch Match is a spatial design, in the form of a ground plan, map, book, visual story, model, or whatever form suits the project best. Often a SketchMatch creates a lot of enthusiasm and accelerates the decision making process. Participants begin to understand each other's interests and try to find jointly supported solutions. It increases support for a spatial plan or policy, because participants have been involved in the creation of it.

Initial aims of the SketchMatch in Cat's Bend were, in short:

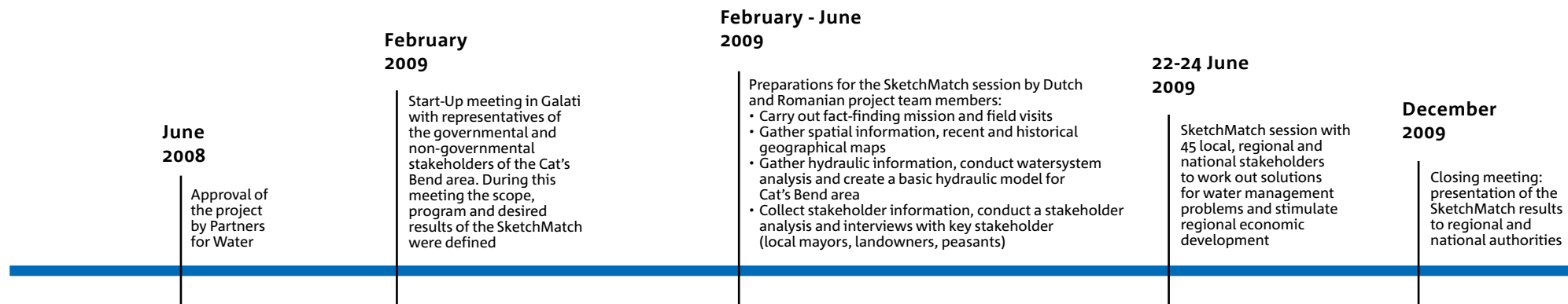
- Introduce participants to this method of interactive design
- Explore suitable solutions to water management problems in Cat's Bend area. Suitable solutions are:
 - Supported by the local, regional and national stakeholders
 - Fit to the usage and characteristics of the local landscape
 - Preferably in accordance with existing policy

The Program of the SketchMatch consisted of the following steps:

- Day 1** Exploration of design-assignment and project area: field-excursion, analysis of the area's characteristics
- Day 2** Exploration of solutions: work sessions, design different solution-concepts, calculate their probable effects with hydraulic modelling
- Day 3** Synthesis: integration of concepts into an integrated sketch, final presentation

A thorough preparation is necessary for every SketchMatch session to become a success. Gathering the essential information, maps and policies is part of this preparation, next to committing and informing participants (inhabitants, professionals, policymakers, etcetera) who will join the SketchMatch.

Project timeline



3 THE SKETCHMATCH DESIGN PROCESS



Project area

- 8 The Cat's Bend area thanks its name to the characteristic meandering curve of the Danube at the village of Grindu, formerly known as Pisica, which means 'Cat' in Romanian. The Cat's Bend area is dominated by large-scale agriculture; almost all of the former wetlands were impoldered and transformed into agricultural land in the 1970's. But the history of the area as a former floodplain can still clearly be seen on aerial photographs: at many locations old gullies, river branches and river levees can still be seen underneath the present pattern of agricultural fields (see illustration below on the right).

These changes in the landscape have had a large impact. Reclamation of floodplain for agricultural use has diminished the room for the Danube river, thus leaving less space for water discharge in case of high water levels. This has caused floods to become more severe, especially in 2004, 2005 and 2006.

Another important development is the recent designation by the EU, of a large part of the area as Natura 2000 site. Restoration of wetland ecology is of great importance here. Many inhabitants disagree with the centralized way in which Natura 2000 was imposed and with the fact that it hampers certain economic developments. Yet at the same time most of them agree that 'something needs to be done for nature'.

◀ Danube basin in Romania

▼ aerial photograph of a former floodplain near Grindu

Problem definition

But maybe even more important than the need for floodprotection and wetland restoration, the SketchMatch learned that stakeholders perceive drought and water scarcity as urgent problems in Cat's Bend, with subsequent economic consequences, especially for agriculture and for the small-scale production of vegetables and fruits that are crucial for local economy. This insight was contrary to the initial premise that floodprotection was a priority-issue and that the project needed to focus on floodprotection-scenarios only.

By taking enough time for analysis, the SketchMatch participants were able to redefine the initial design-problem. Thus the project focus shifted from an emphasis on floodprotection toward a much broader view on the region's problems and development, in which aspects of ecology and economy were combined.

A SketchMatch is aimed at generating stakeholder-supported problem definitions and solutions. Its aims and method should be flexible enough to give room to participants' own perceptions and ideas. Therefore, the design-assignment of the Cat's Bend SketchMatch was re-defined and broadened with the socio-economic dimension, so that all participating stakeholders would support it.



Redefined design-assignment

- How can the watersystem best be managed in the area, so that it can adequately store, maintain and discharge water?
- How can the economic vitality of the area be stimulated and managed in an environmentally sustainable way?

◀ boundary of project area (map source: DDNI)





Working method

Instead of persisting in an assumed contradiction between ecology and economy, SketchMatch participants recognised the importance of bringing ecology and economy together in new solutions for water management problems. On the first day, they analysed the area's characteristics in four different groups. This gave them insight in the area's main problems, qualities and potentials:

Examples of area characteristics as defined by participants

problems

- landslides resulting from erosion
- lack of fish
- drought
- degradation of soil
- floods
- unemployment

qualities

- fertile soil for agriculture
- existence of wetlands
- human resources
- attractive landscape
- good infrastructure and dikes
- (on certain places)

potentials

- high production potential for agriculture
- potential for tourism development
- potential for fishery connected to tourism (re-introduction of the sturgeon)

Discussions and solutions

At the end of the first day, participants could formulate a few general starting points for good design solutions for Cat's Bend area, based on the mutual discussion they had:

Starting points for good design solutions

- 1 Bridge the contradiction between ecology and economy: stimulate the development of both
- 2 Use existing spatial characteristics and integrate already-made investments into solutions
- 3 Create new value by combining spatial functions (for example: water retention with water recreation and fishery in a newly developed waterway)
- 4 Take future management into account; are proposed solutions feasible to carry out?

With these starting points in mind, on the second day participants defined three main design concepts.

Design concepts

- 1 The concept of the new channel 'Canulul Ciulinet'
- 2 The concept of reinforcing the irrigation system
- 3 The concept of applying Room for the River measures

These three concepts can be seen as the rough building blocks for future water management solutions in Cat's Bend. They were developed and worked out in three different groups.

Schita Integrata

On the last day, the project team's designers had the task to integrate these separate building blocks into one final, integrated design: the 'Schita Integrata' in Romanian language. This Schita Integrata can be seen as the end product of the SketchMatch workshop, in which all the efforts and ideas of three days' hard work come together.

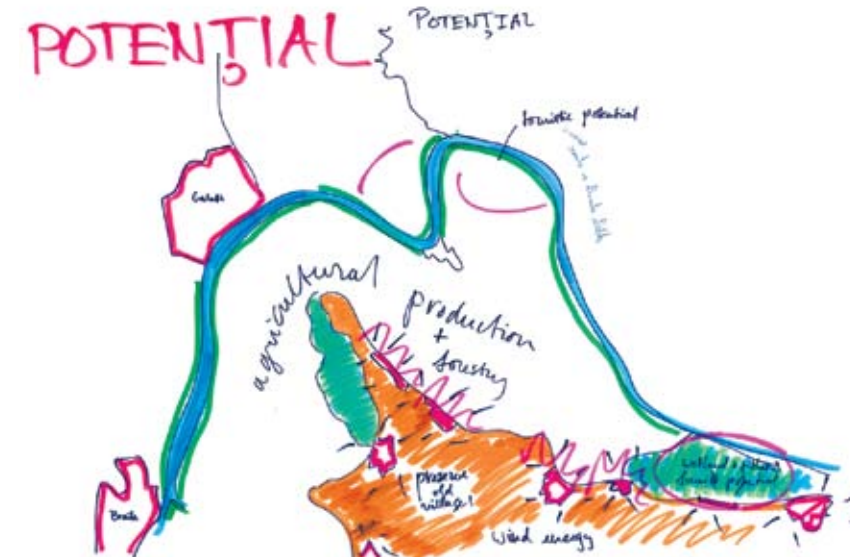
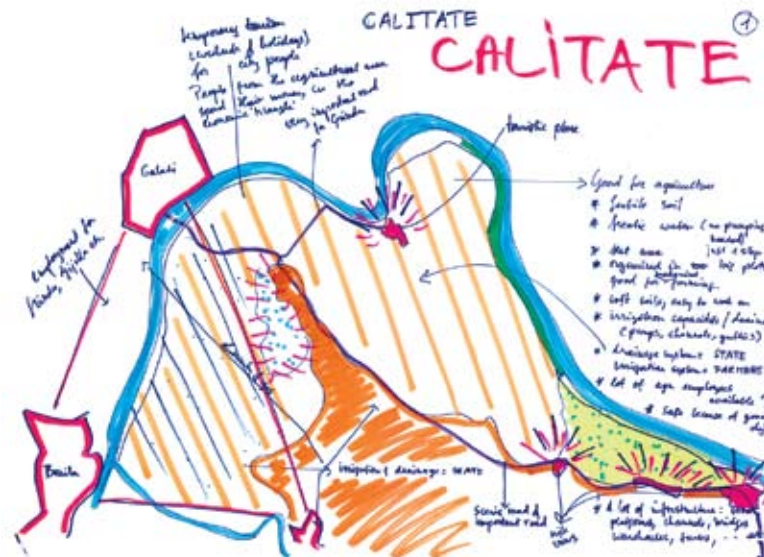
The Schita Integrata is a regional perspective as an answer to:

- a Regional ecological/climate issues like drought and flooding
- b Regional socio-economic issues like economically viable and sustainable land-use

The Schita Integrata and the concepts behind it are described in the following chapter.

10

11



4 SKETCHMATCH RESULTS

The three different design concepts, which compose the Schita Integrata, are indicated with the numbers 1, 2, 3 and described in more detail in the subsequent paragraphs.

SCHITA INTEGRATA



1

Canalul Ciulinet

This idea departs from the principle of restoring and connecting a series of old Danube creeks and wetlands by a new west-east connecting channel along the Macin mountains. This new navigable canal will particularly stimulate microclimate and economic development in the villages at the foot of the Macin mountains, while connecting them with the Danube river. In case of high discharges of the Danube, it will serve as a flood channel, thereby reducing the Danube water level.

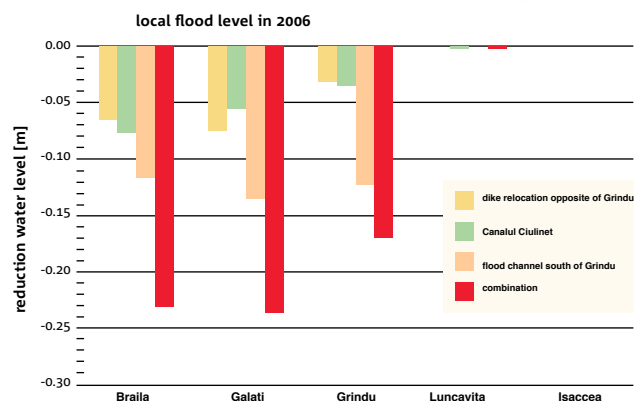
System of infiltration and drainage channels

This idea is based on the existing irrigation system of infiltration and drainage channels. It seeks to improve this system and connect it with a historical pattern of creeks and streams. Infrastructure and plantings run parallel to the channels and contribute to the visual and ecological quality of the landscape. This design concept particularly reinforces the potential for agricultural production and also improves microclimate.



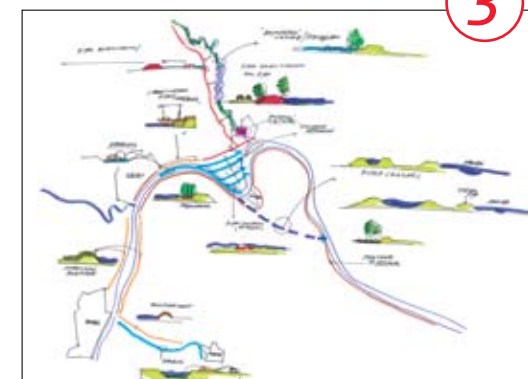
2

▼ Hydraulic model diagram of probable effects of the three different design concepts and their combination. The expected water level reduction was calculated for five locations in the project area, of which Braila is most upstream and Isaccea most downstream. Source: HKV report 'Room for the river Danube in Cat's Bend Romania - Hydraulic study' (see CD-ROM appendix)



Hydraulic modelling

All three design concepts were analysed with the HKV hydraulic model, to (roughly) evaluate the hydraulic effects on the Danube level, with Braila as reference location. Thus the probable effects on water level at Braila were calculated, assuming a similar water discharge as during the floods of 2006. The results of these calculations were used during the SketchMatch to improve the effectiveness of proposed measures and to enhance the quality of ideas and discussions.



3

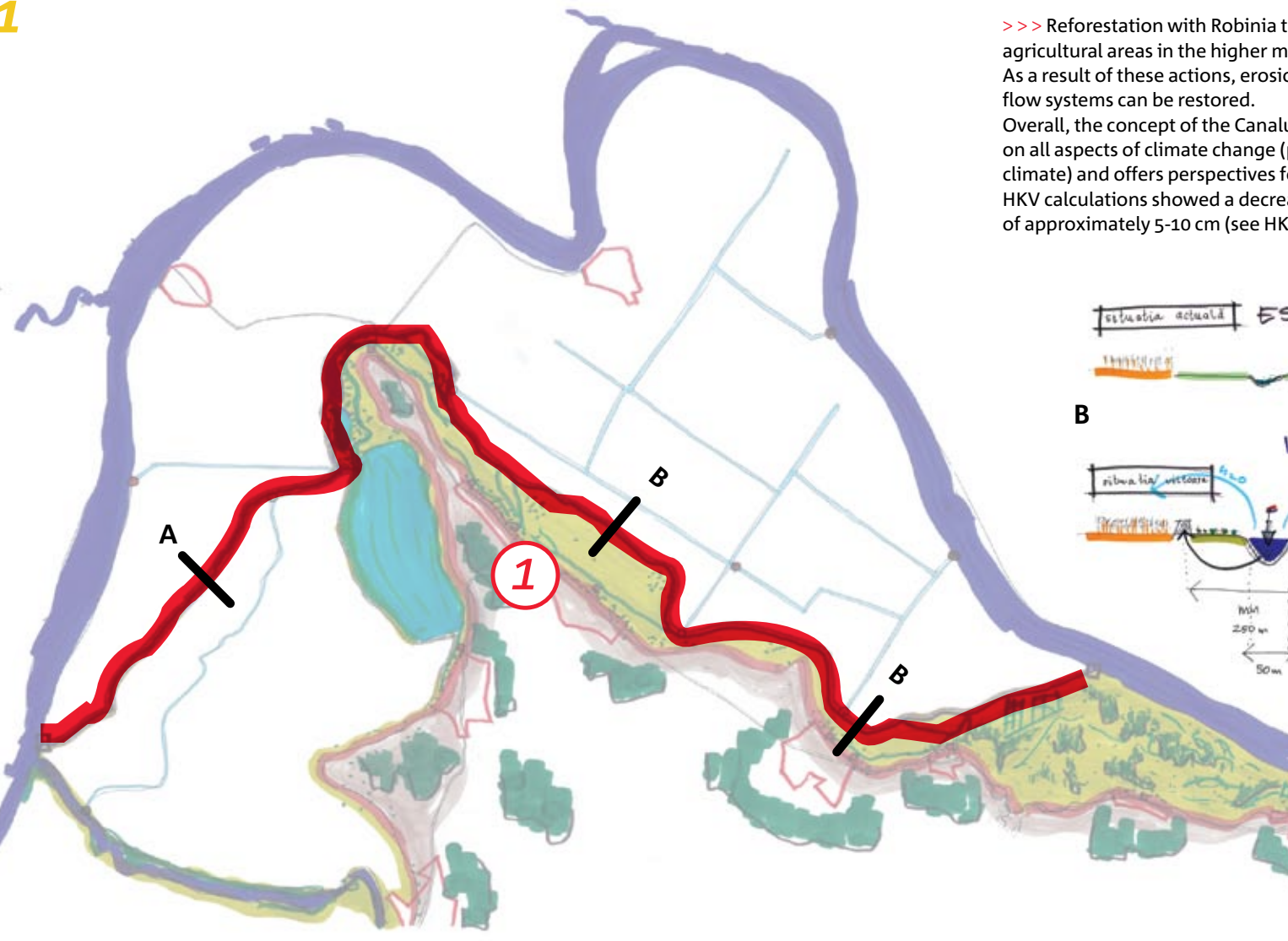
Application of Room for the River measures

This idea contains the application of two Room for the River measures: a dike-displacement north of Grindu and a flood channel south of Grindu. These measures contribute to flood protection by reducing water levels on the Danube. It is possible to combine these measures with the system of drainage and infiltration channels (2).

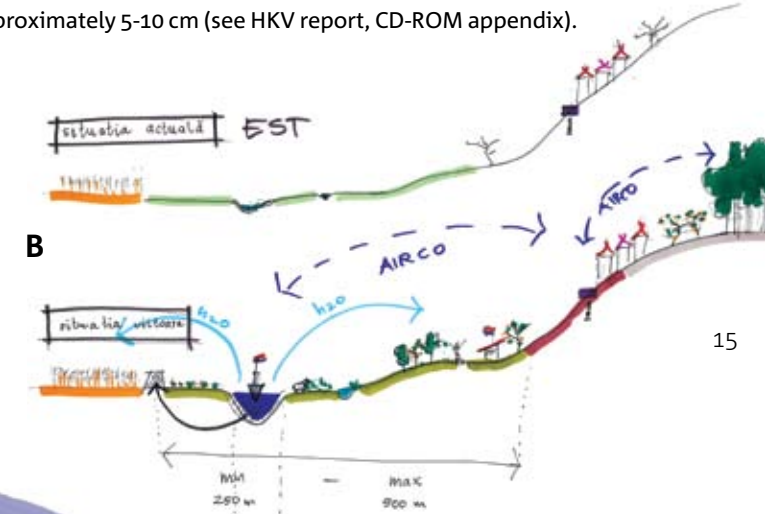
DESIGN CONCEPT 1

Canalul Ciulinet

The Canalul Ciulinet is a new, navigable canal along the foot of the Macin mountains. The main aim of this channel is to reconnect the remnants of former creeks and channels along the Macin mountains with the Danube river. The Canalul runs from Braila in the West to Isaccea in the East of the study area. In this way fresh, flowing water will be reintroduced in the zone at the foot of the mountains and nearby villages. Small-scale traditional agriculture (vegetable and fruit cultivation), as well as modern, intensive arable farming in the former floodplains, will profit economically and ecologically. An open connecting channel with the Danube may offer perspectives for navigation by small (recreation) boats. The reintroduction of fresh water may restore opportunities for fishery in the area, enhance ecological and landscape development and offer new perspectives for local economy. Increasing the amount of water at the foot of the hills combined with the plantings of new vegetation, will also improve microclimate in and around the villages. >>>

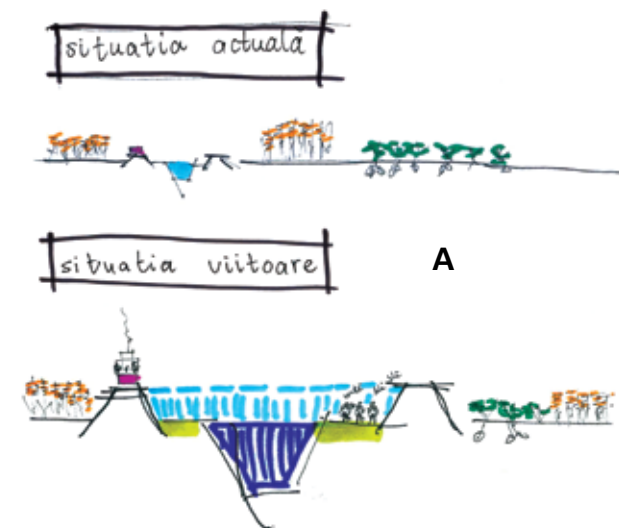


>>> Reforestation with Robinia trees and re-use of abandoned agricultural areas in the higher mountains, will add up to this. As a result of these actions, erosion will be prevented and groundwater flow systems can be restored. Overall, the concept of the Canalul Ciulinet has a positive effect on all aspects of climate change (peak discharges, droughts, microclimate) and offers perspectives for local economical development. HKV calculations showed a decrease in water level on the Danube of approximately 5-10 cm (see HKV report, CD-ROM appendix).

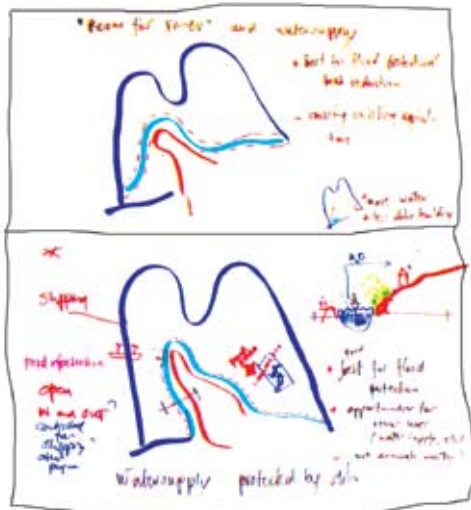


Macin Slope (B) ▲
The zone around the canal can be strengthened economically and spatially. Small-scale harbours close to village centres facilitate the transport of goods and recreation. Agriculture and horticulture around the villages profit from the availability of water. Plantings of orchards and forests can prevent erosion of hill slopes.

Canal profile (A) ▶
The canal is dimensioned 50 m wide. A zone of 250-500 m along the eastern foot of the hills can be used for flood protection. On the floodplain side a dike will be built. In the western part of the project area, the canal crosses agricultural land. Here, the floodplain part will be about 200 m wide and is bordered by a dike on both sides. The canal profile permits multi-functional use of the canal forelands. In case of high discharges, the canal's full storage capacity will be used. In case of low or normal discharges, the canal forelands can be used for agriculture or nature. On top of the dikes infrastructure can be realised or they can be planted with trees and shrubs.



◀ **Canal model studies**
The Canalul Ciulinet was considered by SketchMatch participants as the best design concept, integrating both socio-economic and climatologic solutions and flood protection measures. This idea materialized from exploratory sketches in which the pros and cons of various options were studied.



DESIGN CONCEPT 2

System of infiltration and drainage channels

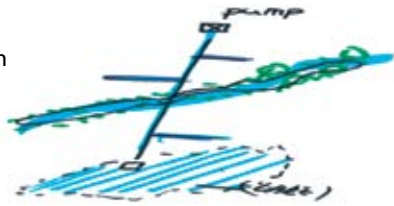
The basic principle behind this design concept is to improve the system of infiltration and drainage channels. This supports the agricultural system, in balance with a sustainable water management in the area. To optimize agricultural use, the existing irrigation system needs to be enlarged and improved. Pumps fuelled by wind energy or bio-fuel regulate the inflow and outflow of water in the area. These pumps are situated at the channels' outer ends. Wherever possible, old river creeks or gullies are used for natural water storage, in combination with small-scale nature development.

The HKV hydraulic model showed that ideas to use the infiltration-drainage system also for storing water during peak discharges, are not so effective. A water level reduction of about 5 cm between Braila and Grindu was calculated, when a volume of about 85 million m³ of water is stored. This seems quite unrealistic.

A better idea might be to incorporate a future flood channel into the agricultural watersystem, south of Grindu (see also design concept 3). According to the HKV/DDNI model, a contribution of about 5 cm reduction of peak discharges between Braila and Grindu might be possible. This flood channel can also be used as either an infiltration or drainage channel, depending on the situation.

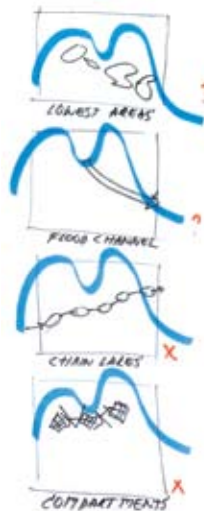
Behind the system

The design concept is based on the construction of a system of partly new and old channels, occasionally linked with old river creeks and/or wetlands.



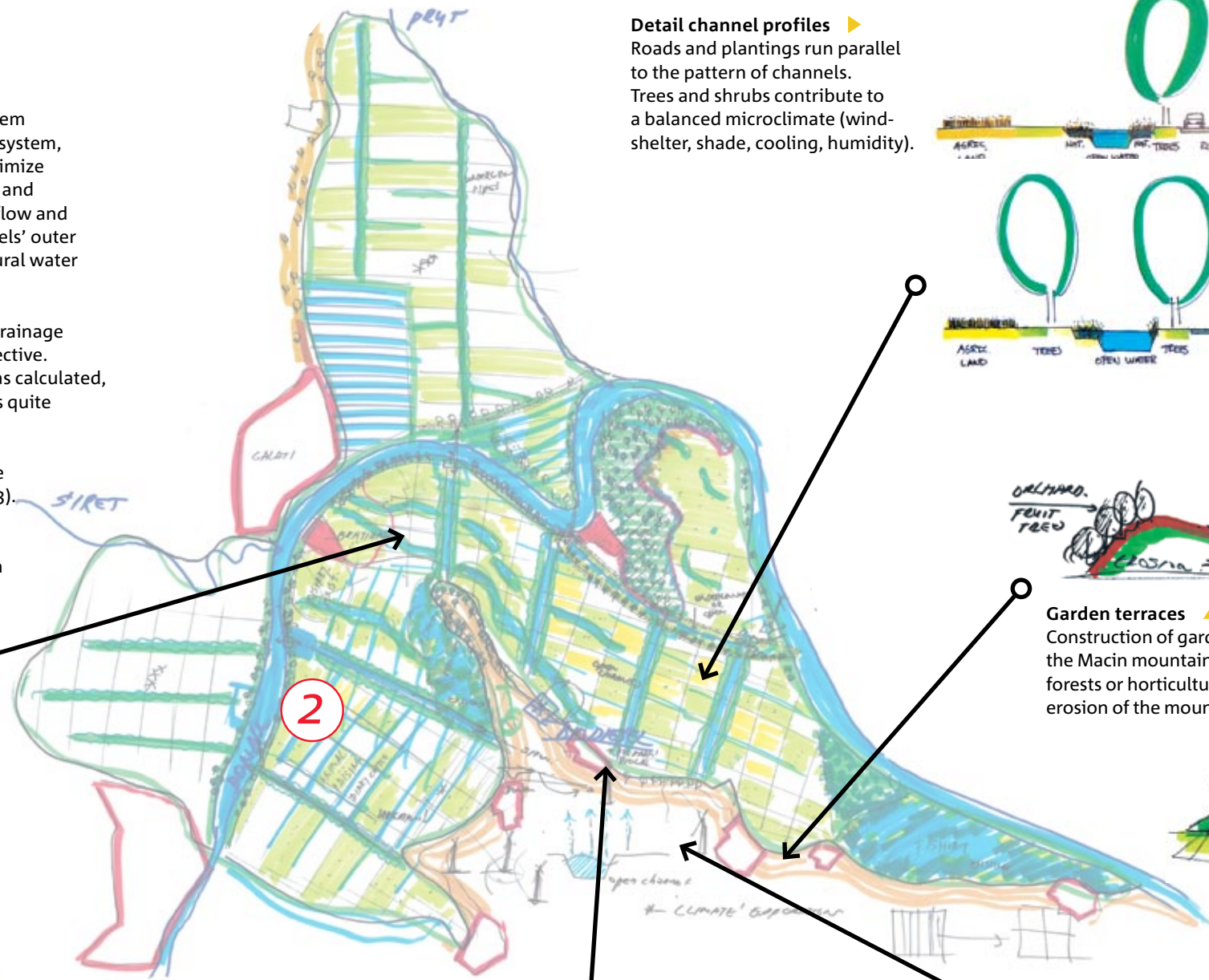
Optimizing agriculture

The rationally designed system of straight infiltration and drainage channels is aimed at optimizing agricultural land-use.



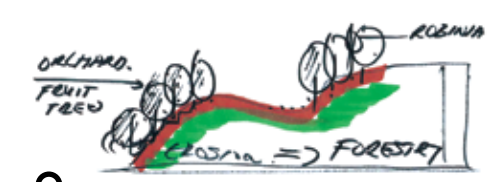
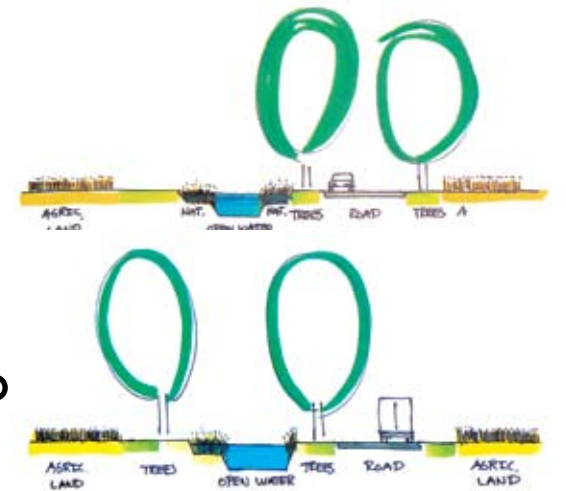
Model study

Spatial study of the possibilities for Room for the River measures. Participants preferred a combination of flood protection measures with the optimization of the irrigation system.



Detail channel profiles

Roads and plantings run parallel to the pattern of channels. Trees and shrubs contribute to a balanced microclimate (wind-shelter, shade, cooling, humidity).



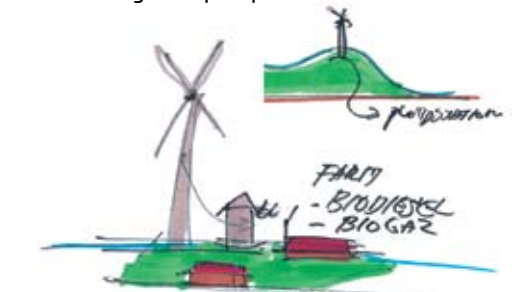
Garden terraces

Construction of garden-terraces on the Macin mountains with orchards, forests or horticulture will counter erosion of the mountain slopes.



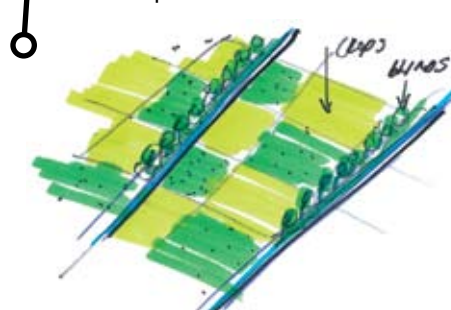
Windmill

Operation of windmills for energy generation is possible near the channel ends and on the Macin mountain slopes. The generated electricity is partly used to operate the irrigation pumps.



Green chamber

Plantings like trees and shrubs parallel to the canals create a visually attractive 'green chamber' landscape.



DESIGN CONCEPT 3

Room for the River

With the help of the Room for the River toolbox, participants explored possible Room for the River measures, which would increase water storage and drainage capacity along the Danube. Of the explored possibilities, two measures proved to be the most effective in this part of the Danube basin. These were the inland relocation of a dike north of the village of Grindu and a new flood channel south of Grindu. For both measures agricultural land needs to be abandoned.

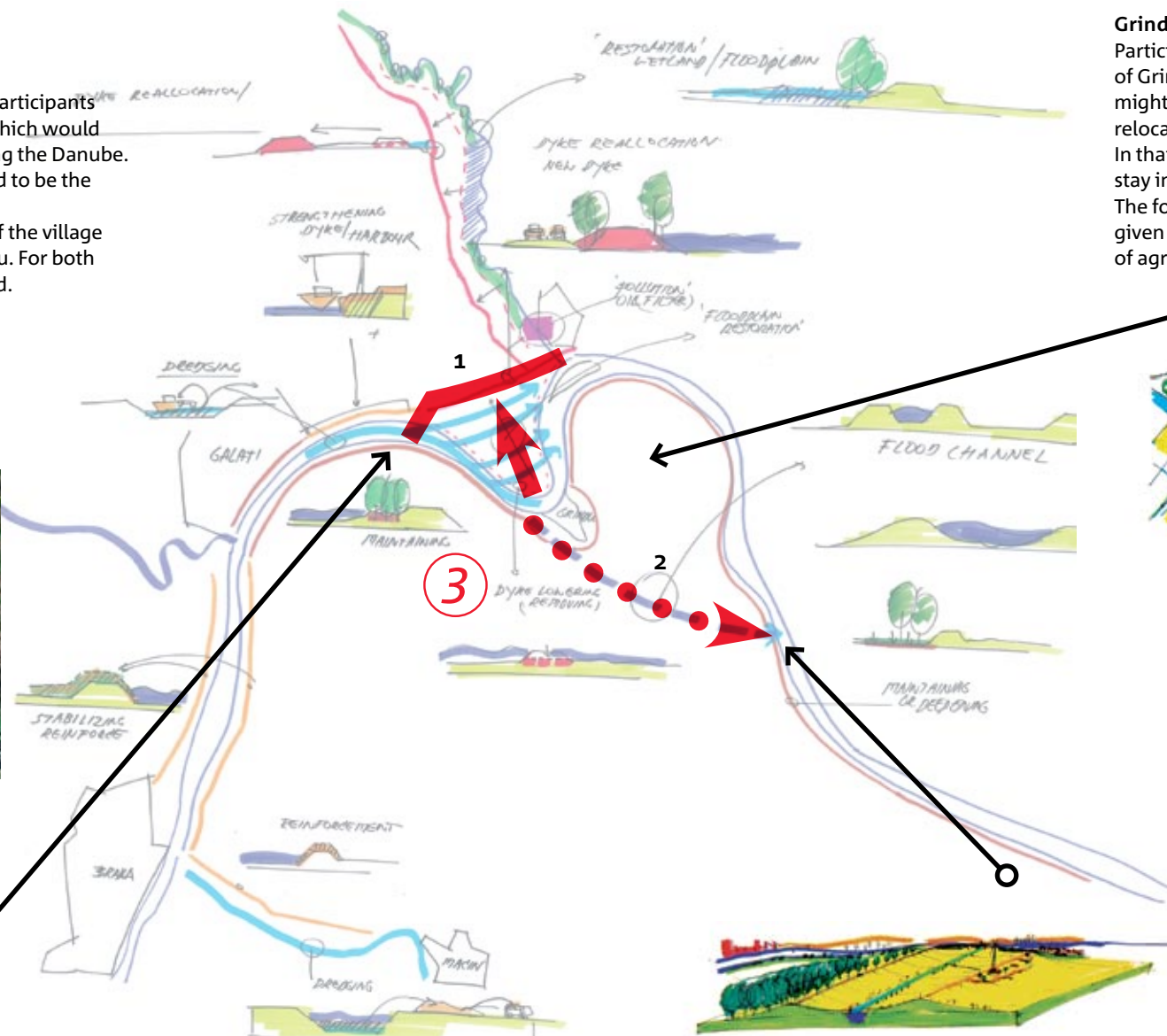
Room for the River measures

- 1 Inland relocation of dike north of Grindu
- 2 Construction of flood channel south of Grindu



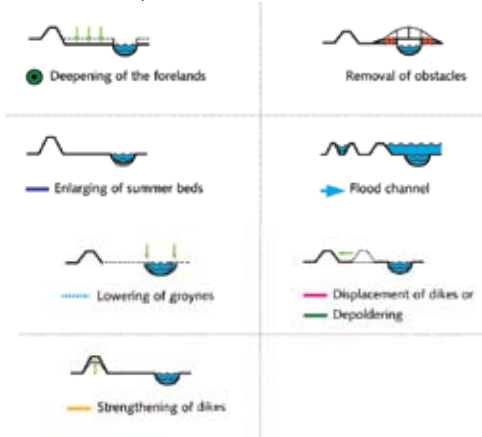
Dike relocation ▲

The relocation of the dike north of Grindu means that this particular area will again become part of the Danube River floodplain system and will be occasionally flooded. This measure would have lowered the water levels at Braila during the flood of 2006 by about 6 cm. The dike relocation implicates the loss of approximately 1200 hectares of agricultural land and also the need to construct a new dike parallel to the main road E87.



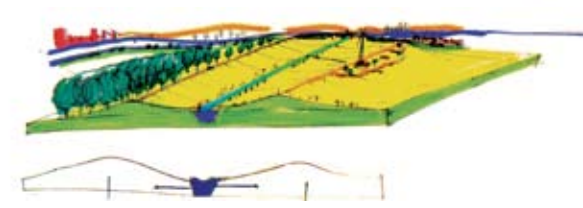
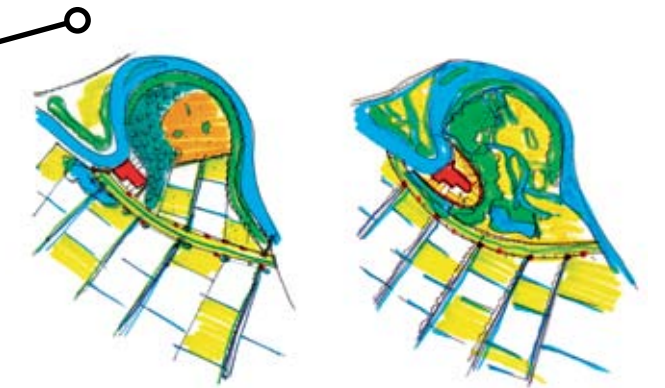
Room for the River ▼

Illustrations of possible Room for the River measures (source: Room for the River toolbox)

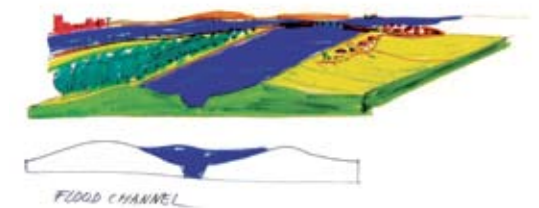


Grindu alternatives ▼ ▼

Participants also sketched two scenarios for the area east of Grindu. In this area, additional Room for the River measures might be necessary in case the flood channel and dike relocation do not suffice to prevent large scale flooding. In that case, the area could be 'given back to nature' or else stay in agricultural use, but in a combination with forestry. The former option of 'giving back to nature' is rather unrealistic given the existing situation. Participants preferred the option of agricultural use combined with forestry.



floodchannel with 'normal' waterlevel



floodchannel with high waterlevel

Grindu floodchannel ▲ ▲

Integration of a flood channel with the agricultural system of irrigation channels (see also design concept 2) is preferred. The flood channel consists of two parts; a deep part of at least 20 m wide, which will always carry water and can be used for irrigation, and an area on surface level of about one kilometre wide, bordered by dikes. This last mentioned area is occasionally flooded in case of high water levels, but can continue to be used as agricultural land under normal circumstances.

The dikes are constructed rather slanted and with a mild slope, permitting the crossing of tractors and construction of new houses on top of the dike. Calculations showed a water level reduction on the Danube of about 15 cm at Grindu and 12 cm at Braila resulting from this floodchannel. One of the consequences of the flood channel's construction will be that Grindu becomes situated on an island, in case the channel is flooded. A new bridge near Grindu will serve as an evacuation route and connect the village to its surroundings.

5 PROCESS OUTCOMES OF THE SKETCHMATCH



An interactive policy-development process such as the SketchMatch is different from a traditional top-down policy process. Using a bottom-up approach generally implies that interests of different stakeholders are better taken into account and that developed solutions are more integrated and sustainable in nature. The outcomes of the Cat's Bend SketchMatch clearly show this: economic, ecological and hydraulic aspects were integrated into the different design concepts.

But following an interactive process also places demands upon the preparation and organisation of a project. This chapter describes the success factors and advantages of the Cat's Bend SketchMatch session. A description of important prerequisites and recommendations for a good SketchMatch can be found in the CD-ROM annex.

Success factors

For the Dutch project team this was the first time the SketchMatch method was implemented in a Romanian setting. It was a challenge to make the method work, taking into account cultural differences and language barriers. But language turned out not a problem thanks to professional translation and Romanian participants proved to be just as inspired debaters as their Dutch counterparts, expressing their own opinions and interests openly. These are important (communication) prerequisites for a good SketchMatch process.

With hindsight, we conclude that the SketchMatch has been a successful method, which fits Romanian temperament and working culture. Several other factors were equally important for this success:

- Enthusiasm and motivation of participants
- Well-qualified and well-cooperating team of Dutch and Romanian landscape designers, hydraulic specialists, process leaders and translators
- Availability of good maps (topographic map, altitude map, aerial photographs, soil maps)
- Thorough content preparation with fact-finding missions 6 months before the start of the SketchMatch
- Start-up meeting with the involvement of stakeholders: during this meeting the scope, program and desired results of the SketchMatch were defined, resulting in good management of expectations
- Well-considered selection of participants based upon insight in the stakeholder-network
- Field excursion to the project area as program-item on the first day of the SketchMatch
- Combination of sketching and hydraulic modelling: design concepts could be screened right away for their (rough) hydraulic effects, using the available hydraulic model. These were used in the following parts of the SketchMatch and stimulated designs to become more realistic.
- Availability of facilities (working-space, catering, etc.)

Advantages of SketchMatch approach

Working with an interactive, participatory method like the SketchMatch has particular advantages over a traditional top-down policy process. These advantages result from the fact that a SketchMatch is a cooperation process in which different stakeholders and experts of different disciplines participate. They bring in their own knowledge and own points of view, with the aim to find possible solutions to shared (spatial) problems. The fact that different stakeholders participated in the SketchMatch and all contributed to the final SketchMatch participants. As one of the participants stated: *"The good thing about the SketchMatch was that it involved a big number of different stakeholders, policymakers together with local people, and invited them to express their ideas and opinions from different points of view (ecological, economical, social)."*

Another participant also saw this as an important result of the SketchMatch: *"the SketchMatch had taught participants about cooperation and to take account of other stakeholders' opinions and suggestions."*

This cooperation between different stakeholders and experts, has certain very clear results and advantages for a project or planning process:

- One result is 'raised awareness' among participants. In Cat's Bend, participants became aware of the nature of the region's watersystem and its interrelatedness with other spatial functions (nature, agriculture) and other aspects (economic viability and micro climate). Participants also realized that integrated solutions are needed to solve such interrelated problems
- Another aspect of this raised awareness can be called 'empowerment': stakeholders become aware of their own power to co-create solutions and of the importance and benefits to cooperate with other stakeholders to reach these solutions
- A SketchMatch invites participants to share knowledge and bring in their views. This ensures that not just one, but many relevant aspects of a problem are studied. This contributes to solutions, which are integrated, locally adapted and tailor-made in nature.
- Conceptual flexibility is another advantage of the SketchMatch method, which ensures that problems and solutions are defined in such a way that participants support them. This adds up to the feasibility and stakeholders' support for measures once they are implemented. In Cat's Bend, the

design assignment was changed so that it could accommodate stakeholders' views. This flexibility is an inherent strength of the SketchMatch, but also implies that end results can not be predicted beforehand

- Acknowledgement of interests is a prerequisite to reach integral and stakeholder-supported solutions. In Cat's Bend, participants realized that their economic interests are dependent, amongst others, on the sustainability of the water system as a whole. In their search for solutions to water management problems, participants aimed to create win-win situations and combine functions as much as possible to benefit both economy and ecology
- The combination of spatial design and hydraulic modeling brings together facts and vision. In Cat's Bend, design concepts could be screened right away for their rough (hydraulic) effects. This gave participants a better insight in the probable effects of their proposals and enhanced the quality and feasibility of ideas and discussions.

Concluding from a small interview research, conducted just after the SketchMatch session, participants were positive about the method of working (see report 'Application of the SketchMatch in Romania' by Joanne Vinke-de Kruijff on CD ROM Appendix). They regarded the SketchMatch as a very useful method to involve stakeholders. This is regarded by all stakeholders as an important aspect in problem solving.

Some people were nevertheless sceptical about the follow-up. They mentioned that the method does not ensure the solutions to be implemented. This is true: the SketchMatch method is applied in the exploration phase of a project, in order to identify problems and generate stakeholder-supported solution concepts. It is essential to build further on these concepts in the next project phase and make these concrete. Just like one of the project partners indicated:

"The ideas resulting from the SketchMatch should be implemented in line with the final sketch, by the beneficiary party (i.e. the Ministry of Environment) together with other authorized organisations."

In the next chapter a few recommendations are given for a possible follow-up.

6 RECOMMENDATIONS

How to build further on achieved results?

The Cat's Bend SketchMatch must be seen as a first step in a long process; as the start of a (renewed) dialogue between policymakers and inhabitants, laymen and experts. The SketchMatch's outcomes need to be worked out into more detail, so that they can be incorporated into new policies and be implemented in the future. Local, regional and national administrators must take the lead in this and continue to work together with local inhabitants, farmers, entrepreneurs and other stakeholder parties.

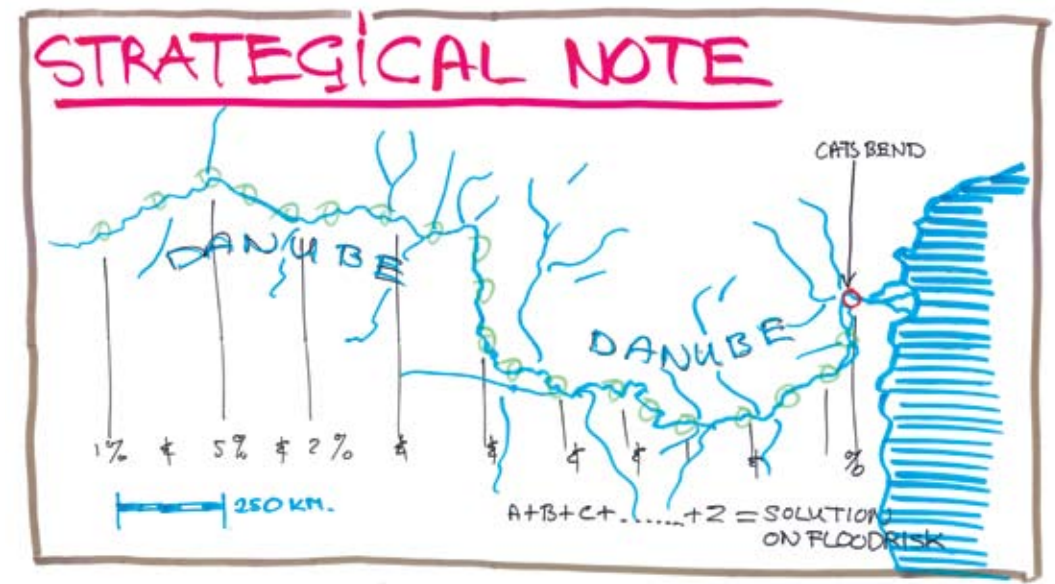
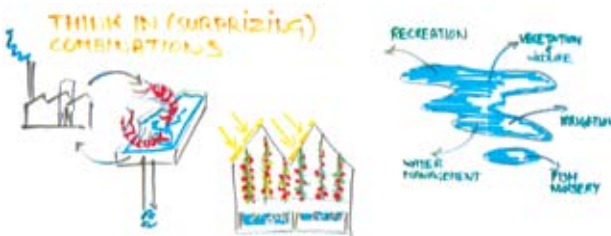
Although it is impossible to sketch a detailed action-plan for the implementation of the SketchMatch ideas in the Cat's Bend region, we try to formulate a few general recommendations based on similar experiences elsewhere.

Approach flood management as a part of climate-policy

Flood management cannot be dealt with separate from other water management issues and -in the end- climate issues. Water management problems are interrelated: upstream measures have downstream effects and vice-versa. Problems of water scarcity need to be dealt with now, to prevent large-scale erosion and exhaustion in the future. Furthermore, the watersystem in an area is supporting many different functions and therefore its (re-)design should be aimed at balancing all relevant aspects. All this asks for an effective, integrated climate-policy promoting sustainable solutions.

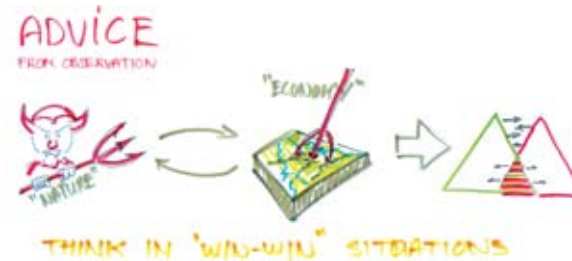
Connect upstream and downstream solutions for flood management

Water management problems are interrelated in nature, and so should be their solutions. The REELD-study provides a good basis for flood protection measures in the Romanian Danube Delta region. But more interventions are needed, also upstream and outside Romania. This interrelatedness between 'upstream' and 'downstream' should be a basic starting point for future water management solutions, ideally resulting in a coherent set of measures along the Danube. A similar study like REELD could be done for the whole Danube-basin and similar workshops like the SketchMatch could be done in other places along the Danube or for the Danube basin as a whole.



Include socio-economic aspects in a broad approach for solutions

Another basic starting point is the interrelatedness of spatial functions and their interaction with the watersystem. Smart combinations of functions need to be examined (like a new flood channel for water discharge, also usable for agriculture and nature). Socio-economic aspects need to be included in water management policies, so that solutions facilitate local and regional developments on this terrain. Most importantly, if stakeholders' interests are incorporated well in future policies, this reinforces their support and strengthens the implementation feasibility of future measures.



Anticipate and act now upon future climate developments

As a result of climate change, more dry and hot periods are expected for Cat's Bend area in the future. In order to stabilise these future effects, it is important to anticipate and act in the present. For example, when we want to use plantings to improve microclimate (woodlands, shelter-belts, shading trees in villages) we have to act now, because this vegetation needs time to develop and fulfil its function in climate improvement.

Use the SketchMatch in policy planning and equip staff to implement this tool

The SketchMatch can connect top-down thinking (policies or studies like REELD) with bottom-up acting (like the solutions defined by stakeholders in a SketchMatch session). A SketchMatch can generate usable concepts on both the (inter)national level of policy, focussing on the whole Danube-basin, as well as on a local level, focussing on a particular project area. Using this method in national, regional and local planning processes and equipping staff with the required skills, is therefore advisable. Practical guidelines concerning the organisation of a good SketchMatch can be found in the CD-ROM annex of this booklet.

Ensure a follow-up of the SketchMatch results in Cat's Bend area

The SketchMatch for the Cat's Bend area resulted in an extensive dialogue and shared awareness of problems and solutions. It is important to consolidate and extend this awareness in the near future. Regional and national authorities have to make clear which elements of the proposals they will or will not adopt, based on clear argumentation. They have to indicate how they will continue to include local stakeholders in the following stages of planning and implementation of measures in the area. This is an important prerequisite to create and maintain the generated local support in the near future. If authorities adopt local stakeholders' ideas and anchor these in new policies, this may create a driving force for a successful, sustainable development of Cat's Bend area. Such a development will safeguard the area from future floods, while at the same time stimulating economy, ecology, the resilience of the watersystem and the living conditions in the Cat's Bend villages.



Think top-down, act bottom-up in a cyclic way

By 'think top-down, act bottom-up' we mean the importance of developing policies on a central level, with a coherent set of starting points and aims, but which should be flexible enough to be fine-tuned on a local level, with the participation of stakeholders and the use of local knowledge. By 'in a cyclic way' we mean that both strategies should be used in alternation with each other. This strategy was used, for instance, to develop the Room for the River program in the Netherlands. On a national level a floodprotection program was formulated with predefined goals (cm's of water level decrease). To determine which measures were required in which place, the Directorate General of Water Affairs held interactive sessions with water boards and community councils. This resulted in measures being designed according to local circumstances, interests, chances and bottlenecks. Efficient use was made of local knowledge and also local administrators' support for the program was generated.