

## **Conditions for the successful combination of flood prevention and river restoration – extract from five examples in Switzerland**

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### **Abstract**

Based on the suggestion in the literature that conservation objectives should be linked with local development objectives to successfully realise community-based conservation, and little available knowledge about corresponding projects, we set off to deepen our comprehension about how these projects work in the field. We investigate cases that were from the outset framed as having two objectives; these cases are combined projects of flood prevention and river restoration in Switzerland. Our aim was to better understand the role of the multi-level governance setting for the success of these projects. The corresponding objective was to identify, what role legal regulations, administrative conditions, available financial resources and other factors from different levels (confederation, canton and municipalities) play for the realisation of these projects. We investigated these projects by conducting personal interviews with project leaders and stakeholders that participated in five collaborative planning processes; for each case we interviewed at least five participants. We find that the difficulty to ‘gain space for the river’ was the main stumbling block for the planning and implementation of these multi-purpose projects. Federal and cantonal regulations and requirements clearly shaped these projects and the corresponding institutions exercised the possible control based upon financial resources. Existing regulations turned out to be flexible instruments and adaptable, when they had been hindering emerging and desirable practices in river engineering. These regulations also permitted considerable autonomy to the local actors to arrange and negotiate their concerns in the projects. This autonomy made it possible to harness the ‘local social ingredients’ we identified as crucial to make these projects work, which are convincing actors that make a case for conservation issues, existing trust within the community –more specifically— to have good reasons to trust that nobody would be disadvantaged clearly more than other, and the willingness of local actors to invest patience and time to avoid conflict and to work on agreeable solutions.

**Keywords:** collaborative NRM, stakeholder participation, qualitative investigation, multi-purpose governance/management, multi-level governance

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## **I Introduction**

In the literature on *community based natural resources management* it has been suggested that biological conservation objectives should be linked with local development objectives and thus multi-purpose approach should be followed to successfully realise community-based conservation (Berkes, 2004). Within this mainly theoretical literature it has also recently been proposed that another condition for the effective combination of conservation and development objectives is to frame such issues as multilevel common problems (Berkes, 2007), i.e., problems that involve different governmental, political or societal levels – be it in the framing of problems, finding solutions and realising these.

Previous research activities that relate to this research field have dealt with combined livelihood and conservation (research) projects such as ‘integrated conservation and development projects’ (ICDP). However, as these projects were invented for less developed countries, the investigations in this topic focus on developing country settings (Blom et al., 2010; Leach et al., 1999). While there are empirical studies on community-based management of environmental resources in developed country settings (Beierle and Konisky 2000; Stringer et al., 2006), these investigations mainly focus on success factors of projects and within them often on participatory and deliberative aspects of projects or programmes and their assessment or evaluation. In this literature factors, which from a multi-level perspective would be considered part of the setting or programme/project such as influence of federal law on decision outcome, are rather treated as context factors and thus external to the project and investigation (Stirling, 2006).

In order to reduce real or potential conflicts between different aims and interests in planning, methods to elicit preferences for environmental resources or goods and services such as multi-criteria methods have been implemented. Repeatedly conservationists or scientists have applied these methods to demonstrate the value of conservation activities, often in monetary terms. In the related body of literature, however, little attention has been paid to means when it comes to implementing policies or programmes to realise the measured economic value of conservation. Up to now studies to elicit preferences, thus, mostly remained in the ivory tower. Some might say this is for good reasons, as they

doubt that these monetary values have the ‘moral authority’ to determine or even influence public policy (on conservation related issues) (e.g. Farley 2008; Spash, 2008). Another strand of empirical investigations in social sciences that deals with conservation issues in developed countries focuses on the measurement of perception of nature, biodiversity or landscape as well as general or environmental value orientations (Brujis et al. 2006; Fischer and Young, 2007; Home et al., 2010; Vugteveen et al. 2010). Yet, this field of investigation also contributes little to the implementation of multi-purpose and multi-level projects that touch on conservation issues.

Given this research panorama we have fairly little knowledge about multi-purpose projects that include a considerable conservation/restoration component and that are realised in multi-level governance settings. We know little about their main challenges, the impacts of multi-level governance settings, and strategies and factors that lead to the ‘successful’ realisation of such projects.

To deepen our comprehension about how projects with combined objectives (multi-purpose) work in the field, we investigate cases that were from the outset framed as having two objectives, namely projects of combined flood prevention and river restoration in Switzerland. As little knowledge is available about the realisation of such projects, we investigated them in an exploratory way.

Our general objectives were to *get an idea* of important and re-occurring stumbling blocks for the realisation of such projects, *to identify* factors influencing the outcome such as legal regulations and administrative conditions, *to record* experiences with such endeavours of the people involved, *to characterise* stakeholder interactions in a multi-level setting, *to better understand* the role of financial resources for the realisation of these projects, in particular how the available resources and conditions attached to them influence choices of the people involved in such projects

Our more specific research objectives were to identify the scarcity factors of these projects, to describe linkages between available money for the project and existing

regulations; how conservation ‘friendly’ these projects were perceived and what negative and positive influences the participatory aspects of the planning processes had on the (conservation) outcomes. We also set off to investigate what unintended secondary effects the combination of different objectives might bring and how they could be avoided, and finally we did this work to make a contribution on how these projects might be improved in terms of their outcome from a conservation perspective.

Due to the lack of empirical research on multi-purpose projects in a multi-level- setting and little theoretical framing, no research-based expectations or hypotheses were formulated for our empirical study. Rather, with an explorative study we aimed at realising our objectives.

## **II Method and setting**

### *Setting*

Our study deals with combined flood-control and restoration projects in Switzerland. In this country, rivers play an important role in the energy sector and for settlement patterns: Around 56% of electricity production comes from hydropower (SFOE, 2009<sup>†</sup>). Further, rivers have strongly influenced how and where people live. Particularly in the 19<sup>th</sup> century streams have been canalised to gain land and to reduce flooding risks for agricultural land, buildings and infrastructure (Hostmann and Knutti, 2009). As a consequence, now 50% of rivers under 600 m a.s.l show an insufficient level of structural diversity (Arnold, 2006). These modifications of rivers and the heavy real estate development in floodplains in the last decades have increased the potential damages from flooding from the late 1980s on due to more intensive peaks of the drainage (Zaugg, 2003). These undesired effects have led to a change in the philosophy of river engineering since the early 1990s, and federal and cantonal policies and regulations now aim at providing more space for rivers including purposeful inundations (BUWAL/BWG, 2003). The challenge of the realisation of this policy is that almost every patch of land in Switzerland is used for a particular purpose. The land available for infrastructure,

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<sup>†</sup> Swiss Federal Office of Energy (SFOE) (2009) Schweizerische Elektrizitätsstatistik 2009, Order no.: 805.005.09, Bern.

agriculture and real estate is scarce, and there are strong drivers for increasing the developed areas. The population density of the Swiss plateau is high with 500 habitants per km<sup>2</sup> (BFS, 2010<sup>‡</sup>). To avoid speculation and protect the agricultural sector, the acquisition of agricultural land and its price is highly regulated in Switzerland, and the prices actually paid for agricultural land are lower than the value the land has for farmers in terms of income (Senti, 2006). Into this panorama emerges the demand for more space for rivers.

### *Method*

To address our research objectives, we chose five case studies that consist of combined flood-control and restoration projects and that were realised with participatory planning processes. We conducted semi-structured interviews along a guideline with participants of advisory groups of these projects. The sampling of the river engineering cases was as follows: To be included in the sample frame, the planning of a project had to be finished at least 3 years ago, the project had to be well documented, and the implementation of plans had to be terminated at least 2 years ago. A further criterion for selecting a project was—due to language preferences of the investigators—that it had to be in the German- or Rhaeto-Romance speaking part of Switzerland. Our search resulted in 22 implemented cases. From these we selected those cases, where the project leader was willing to collaborate and where we could expect some level of public interest in the project. Thus, the planning process had to involve at least representatives from municipal agencies, representatives of the fields of conservation, fisheries and land-owners; also the restored river stretch had to be longer than 1 km. The sampling process resulted in the selection of five river engineering cases (combined flood-control and restoration) along the streams of Flaz, Kander, Langente, Thur, and Wyna. (Further information about these cases can be found in Table 1).

We applied purposeful sampling (Patton, 1990; Coyne, 1997) to get interview partners who would be able to provide rich information from a wide range of professional and personal perspectives. We partly based the sampling of interview partners on information the project leaders provided us. For each selected river engineering project five to six

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<sup>‡</sup> [http://www.bfs.admin.ch/bfs/portal/de/index/regionen/thematische\\_karten/03/14/01/01.html](http://www.bfs.admin.ch/bfs/portal/de/index/regionen/thematische_karten/03/14/01/01.html)

interviewees were selected to represent the sectors/functions: responsible planning agency/building authority (in most cases cantonal, in others municipal), conservation (governmental or private/CSO (civil society organisations<sup>§</sup>)), fishing, farming (and other land-owner if relevant in the case, such as local common land collectives - *Burggemeinden*), and the municipality. Thereby, we preferred participants that were continuously involved in the planning process, if possible from the beginning.

The interviews with the selected persons were guided by a list of key questions and optional sub-questions allowing deepening interesting issues. The sections of the guideline addressed the role of the interviewee in the process, characteristics of the planning process, the most important factors in the decision making about alternative options, the role of finances, arrangements found during the negotiation process, winners and losers of the process, the duration of the project.

Overall 26 interviews were conducted. Only one of the interviewees was female; the age of the majority of the interviewees ranged between approximately 45 and 65 years. The interviews were all digitally recorded and transcribed.

### *Analysis*

We analyse the data along the dimensions of a) influence and interest of the federal, cantonal, and municipal level and b) the influence of civil society organisations; we look at c) the positions of the sectors fisheries, conservation, agriculture and their interaction in the planning processes; we d) investigate the role of financial resources at different governance levels and in the negotiation process between these levels and as a result of their (sectoral) origin that is whether they come from the flood control or conservation department.

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<sup>§</sup> CSO are legal entities without commercial interests and not being a public body; their aims are common interests for society.

### **III Results**

#### **Main results – land and deals for land**

The main stumbling block for the planning and implementation of combined river restoration and flood control projects was in all cases the difficulty to ‘gain space for the river’. Land turned out to be the most important substantial scarce factor for the realisations of these projects. Due to low compensation payments for land, farmers tried to get compensated in kind, i.e. with land instead of money. This resulted in a major challenge for the project leaders: to find deals about land to be able to realise the flood prevention and restoration measures.

We also found the urge of farmers to be compensated with land not only to have material reasons, but also to be strongly related to what interviewees have called ‘mentalities’. Only some farmers were open to adapting their farm practices to get along with less land, i.e. produce less, and instead reorienting their farm to generating income for non-productive agriculture such as landscape maintenance. For other farmers, such a farm practice is an oxymoron and they perceived it as strongly restrictive when their practices were impacted/regulated due to conservation concerns.

In all the cases we investigated we identified specific deals to gain land for the stream. In the case of Wyna, one farmer gave up his agricultural activities and sold his land to the canton. The canton swapped this land with farmers possessing land needed for the project. The land close to the river is now leased by the canton to the former owners for a symbolic amount and they use the land according to conservation conditions. Furthermore the farmers can declare the land as part of the ecological compensation area they are obliged to have according to federal regulation to get agricultural subsidies. With this arrangement, the canton provides strong incentives for non-productive farm activities. In the case of Flaz, in a forest area trees were cut to create new pasture. This land allowed compensating for the lost pastures due to the relocation of the river. In the case of the Thur, the canton agreed to assume the risk of maintenance payments—which is according to the cantonal law the responsibility of the municipalities—that resulted from the higher flood dynamic, which in turn was the as a result of restoration measures.

This deal of assuming (financial) responsibility for the measures proposed by the canton was of crucial importance for the acceptance of the project by municipalities and the farmers (that are tightly entangled with the municipalities in canton Thurgau).

To achieve these deals a crucial 'social input factor' was needed, which is potentially scarce in other cases: people who had the capacity, time and willingness to negotiate the new repartition of land and to expose themselves in these processes to nasty comments from angry interlocutors.

Next we present the dimensions we identified as relevant for the success type i) general project success and ii) realisation of conservation/restoration measures. Yet, before we point the reader to table 1, which gives an overview over the characterising aspects of the five river-engineering cases we looked at.

#### **Conditions for general success of projects (success type i)**

To have a strict but in some senses flexible legal framework on the federal and cantonal level in place that is clearly enforced provided guidance to the projects. Nowadays cantonal and federal agencies in Switzerland provide approbations and subsidies/money only if considerable restoration measures are planned and implemented. And these conditions for subsidies and approvals are clearly reflected in the character of river engineering projects. An exception in our sample was the case of the Langete, which was the oldest case; regulations regarding ecological measures had not been imposed when measures at this stream were planned in the 80s. The federal legal framework was particularly mentioned for the case of Wyna as very supportive for the negotiation power of the conservationists.

Despite the legal framework set by the confederation and the cantons we observed high levels of local autonomy in project planning and implementation. Also a municipal contribution to the project costs was obligatory in all the cases, which we also found to be a factor for project success in general and for extent of ecological measures in particular. Local *financial* investment in the projects seem to have spurred the investment of local

*social and political capital* for the benefit of the project, which later on resulted in local identification and a sense of ownership over the project

We also found the strong orientation towards consensus within communities and the disposition to invest patience and time to avoid conflict as a supporting factor of these projects. We saw an even stronger consensus orientation in those projects in which only one or two communities were involved and suggest that spatial proximity might explain why conflict is particularly avoided among actors with a high likelihood to interact in other contexts. Actors had interacted extensively to find solutions; in one case the person in charge of farmers' issues within the project (a farmer himself) reported a total of 100 meetings he attended to get an agreement on land-swaps in the community.

Clear leadership or a person with a clear vision who pushes the project and who has both, the capacity to communicate limitations ('room for manoeuvre') and to 'create stakes', that is, to find ways to compensate those who are in the risk of loosing due to the project, turned out to be indispensable for the realisation of agreements on projects. Interestingly several interviewees told us that they had preferred less investment in terms of time and meetings in the attempt 'to make everybody happy' and that they had missed stronger leadership. Also one project leader concluded that he would probably lead the next process a little firmer. None of the interviewees expressed that leadership had been too strong. Thus, there is some indication that when people are inexperienced in participatory processes, they tend to follow 'too' 'participatory styles' or at least what they imagine as such. Yet, the benefits of participatory planning were clearly acknowledged. The challenge for the project leaders seems to be to find the happy medium between authoritarian style and lack of (perceived) decision-making ability; they have to be decisive, but also take into account the different concerns in a balanced way.

Existing trust within the community –more specifically— to have good reasons to trust that nobody would be disadvantaged clearly more than others and that good solutions were intensively searched for we found to be an important 'input' factor for the successful planning and implementation of such projects. But also external pressure from,

e.g., flood-risk, a hanging approbation from the canton or insurance company contributed considerably to moving on the projects.

As indicated above the cases are different in a number of aspects. Again with reference to the number of involved communities we identified the size of the project (i.e. length of river stretch on which measures have been implemented) to be directly linked to the presence of a regional institution (in its size located between the cantons and the municipalities). Their presence strongly supports regional projects and thus solutions closer to the natural/ecological scale of rivers. However, the formation/creation of these supra-municipal or regional institutions is challenging. In the case of Langeten the formation of such an institution took 6 years. One of the typical challenges for their set-up and whose resolution took around 2 years, was finding a formula to distribute the fraction of the costs the municipalities have to contribute to the new institutions and its projects among the participating municipalities.

Features of the processes we found relevant for ‘making them work’ or having contributed to their successes are compiled in table 2.

### **Success factors for the realisation of conservation measures within these projects (success type ii)**

We identified a series of strategies and conditions that favour conservation aspects/measures of river engineering projects. Openness or willingness to learn on the side of leaders and stakeholders alike seems to be one of the most important factors. Numerous interviews showed that participants had changed their perception of the local stream over the course of their attendance. However, often this seemed rather the result of positive results in terms of the *approval of pilot measures by the general public*, or the aesthetic value of measure and less because of the ‘power of the good argument’ by those participants that represented conservation interests or a general change in attitude towards pro-conservation positions. Only two respondents reported fundamental changes in attitudes; and both were conservationists.

The following factors we clearly see as having fostered restoration aspects of river engineering projects: the local representation of conservation interests and particularly the personal engagement of people with a ‘high commitment to ecology’, which expressed itself in high –and by other participants admired levels of— knowledge of species or ecological relationships, the willingness of conservationists to explain and demonstrate ecological phenomena to other stakeholders, and to perform do-it-yourself conservation activities. These activities clearly helped conservationists to gain recognition within the participatory planning group. Conservationists brought other participants in direct contact with conservation issues in the field. And this clearly supported the final implementation of restoration measures. Conservationists also initiated discourses that appealed to emotional or aesthetic aspects of the streams and their surroundings. This seemed to have contributed considerably to the implementation of restoration measures. The particular advantage of the aesthetic argument seems to be that it resonates with people across parties and thus to generate cross-party support for restoration measures.

The availability of land is also a limiting factor for the restoration aspects of the projects and what we said about the importance of the ability by the project leader to create stakes holds for the conservation aspect as it does for the flood control element. Exacerbating for the latter is the general lower acceptance of restoration in comparison to flood control measures by farmers whose grandfathers and fathers had ‘gained’ land from the rivers by damming and draining.

Two of the conservationists we interviewed reported extensive learning experience from their participation in the deliberative planning processes and admitted that they had started off with behaviour and demands that they now consider excessive. They had, for example, tried to get their points through by 100% and had seen all agricultural activity as fundamentally damaging to the environment. In the course of their participation they learned to better understand the positions of others, particularly farmers, and this contributed to change in their demands and ultimately to agreements about plans. (For an overview of the factors we discuss in this section see table 3.)

In the following section we present results that are relevant for both types of success and that cannot be clearly attributed to one or the other. For this reason we present these crosscutting points together, but separated from the former parts of the results.

### **Role of financial resources**

First of all we did not find a clear relationship between available amount of financial resources for conservation and the realised 'extent' of conservation in terms of its likely conservation effectivity. For example, usually a certain amount of money has to be spent for conservation measures so the project gets approval from the federation and the canton. However, often these financial resources do not match up with gained space for the river in the implementation, but rather money gets spent on expensive small-scale conservation measures that require high financial investment for, e.g., dredge, but that have disputable conservation effects. This happened when farmers had considerable influence on the outcome of the planning process and, thus, the local conditions were not 'ripe' to gain considerable space/land for the river.

Second, there were clear effects of changes in federal and cantonal policies detectable in the river engineering projects we investigated and financial incentives played a crucial role for changes in practices on the ground. However, interviewees had clearly diverting evaluations/assessments of the role of money for decisions made in the process. In some cases overall project and conservation costs seemed not to have played an important role at all. One interviewee in the Thur-case said that it was all about ideology and that money had almost zero importance. On the one hand, the perception by a farmer to be existentially threatened in the case of land-loss can hardly be labelled ideological, on the other, not to be willing to change agricultural practices and to categorically reject ecological forms of farming or to gain considerable proportions of income from non-productive activities can probably be labelled 'ideological'. On the contrary for the case of Kander/Augand the importance of available financial resources from the federation and the canton was assessed as decisive for the project-realisation-particularly for the

amount of conservation realised. For the case of Flaz one interviewer stated that money posed the frame and that the conservation part was ‘planned into’ this pre-existing frame.

Our third insight about the aspects of financial resources is related to the source of funds. The opinion of our respondents was divided about the issue of whether it is desirable to have high levels of financial resources available in river engineering, which is a traditionally well equipped with financial resources, presumably because of immediate damages from flooding; even today lives are lost due to inundations. Some respondents argued that the more financial resources there are in river engineering, the more will in the end be paid for conservation measures. Others argue that the more money there is in the account for river engineering, the less is secured for conservation and that flood control measures always have the potential to negatively effect conservation interests.

An interesting role is played by financial resources of civil society organisations. In comparison to total project costs they might be considered insignificant, however, they have other features that make them more relevant than one might suspect: they clearly communicate appreciation and that the project is worth particular recognition; money from CSOs also ensure visibility, which is particularly important for local actors who feel sense of ownership—and sometimes even expressed pride—for the(ir) projects. Also private foundations can apply money differently than official bodies, which have to comply with (strong) conditions whenever they spend financial resources. Private organisations do not have to comply with these rules, which gives them more opportunity to direct them to very specific aims.

Additional insights regarding the role of financial resources concern the strategic use of the ‘money argument’. From one case it became fairly clear that every actor had room to express his wishes regarding the project in the beginning. In this phase the conservationists had proposed to take a series of ditches out of the tubes they had been placed in the past. However, the farmers were strongly against this measure as it had complicated their activities. The canton justified the omission of the measures (and to NOT take the ditches out of the tubes) with lacking financial resources for the measure.

Our sense, however, is that the ‘we don’t have money for that’ argument might be an easy way to ‘mediate’ conflicting positions within a project. Last, hard negotiations about money (even about small [compared to total project costs] amounts) seem to take place when there is actual room to negotiate about money. This occurs among municipalities when several municipalities cooperate in a project and the formula has to be found to distribute the fraction of the costs each municipality has to pay among the participating municipalities.

Last, the use of financial resources clearly reflects the priority of flood control and conservation aspects of these projects. Flood control has obvious priority, and conservation/restoration is the subordinated objective –the most important, thought. As one responded expressed it: “conservation was the most important minor point (“*Die wichtigste Nebensache*”).”

### **Remaining challenges**

There are clearly remaining challenges despite encouraging successes such projects had and have. One of them was/is the often strong overlap between council leaders and agricultural interests, which relates to most of the following points in this section. Particularly in the case of Thur there was the perception prevailing that the planning process project had been highly politicised. The influence of politicians can be seen as disruptive, but also as an integral part of *de facto* decisionmaking. So actors –including conservation actors—might be well advised to get used to ‘interest-and-power-based’ decisionmaking as part of the process and not as something external to it.

Municipal leaders are clearly those governmental actors who showed the lowest initial willingness to provide extra space to the streams. Particularly to permit rivers space so it might follow its own dynamic is an idea that discomfited council leaders. The thought that the local stream might demand financial investment from time to time—every 5-10 years—meant that it turned into a continuous preoccupation; the preference, however, was to deal with issues and finalise them (for a couple of decades). We also identify the preference for ‘active’ or dredge-based conservation at the municipal and regional scale.

There the construction industry can profit from conservation; a fact that might also explain the relative high support of those measure in comparison to traditional rather 'passive' conservation activities.

We also identified indications that municipal actors avoided payments for conservation measures. Typically they tried to limit their payments to flood control measures. An instrument to ease the situation has been implemented in the canton of Bern; it is a river restoration fund that particularly finances the conservation part of the municipalities' contribution to the overall project costs.

Only slowly changing mentalities regarding the function of river engineering interventions have been pointed out by those interviewees, who would have liked to see wider extensions of conservation measures. Particularly older community members in rural areas that are little influenced by thinking prevalent in the cities still favour historical strategies in river engineering that focused on gaining land and getting rid of the water as fast as possible.

#### **IV Discussion and Conclusion**

Our study generated two main findings. First, we learned that scarcity of land was the re-occurring stumbling block for the realisation of combined flood control and restoration projects. Second, we identified a common hierarchy of main objectives: the river engineering projects primarily aimed at securing buildings and infrastructure from inundations, secondarily they should "bring some nature back". Federal and cantonal regulations and requirements clearly shaped these projects and the corresponding institutions exercised the possible control based upon financial resources. The federal and cantonal administrations only provided these financial resource if the projects complied with their guidelines. Yet, these regulations turned out to be flexible instruments and adaptable, when they had been hindering emerging and desirable practices in river engineering. Additionally, these regulations permitted considerable autonomy to the local actors to arrange and negotiate their ideas and needs in the river engineering project. In particular, this autonomy allowed the necessary re-distributing the scarce land. Yet, for

such arrangements, newly established trust relationships and those of the past were needed. Negotiation of land that actually resulted in a deal or exchanges turned out to be impossible without good relationships. Any compulsory acquisition or force would have created political trouble and would have endangered the river engineering project or heavily delayed it. As to the conservationist dimensions of the projects –though on a secondary rang—these profited from changes in the legal framework, in particular those of the law that regulates constructions related to water bodies [*Wasserbaugesetz*] that was changed in the early 1990s; it strengthened the conservationists’ position in shaping the projects according to their values and concerns.

Financial resources played a very interesting role for the realisation of the conservation dimension of these projects. Yet, this role is difficult to entangle. Interviewees assessed financial resources in the range from ‘crucial’ to ‘non-relevant’. We conclude that it would be naïve to believe conservation measures only needed more money, but also would it be naïve to think money does not play any role at all regarding the conservation measures of such projects. Hence, financial resources cannot buy conservation “on their own”, but to achieve restoration without such resources is also unlikely. Our analysis shows that more conservation measures can be achieved if financial resources spent for river engineering are tight to restoration and conservation efforts.

However, to realise such multi-purpose projects one important additional ‘ingredient’ are convincing actors that make a case for conservation issues. Such actors seem particularly convincing if they have a local background, are willing and able to listen to concerns of other actors, and they are able to gain respect in the group planning the river engineering project, for instance due to their societal position or recognition.

We found that each project went through its particular learning process; this phenomenon has already been pointed out by earlier research (Pahl-Wost et al. 2007, E&S). Furthermore, it became clear in our analysis that ideal or optimal solutions are not the aim of the negotiation processes but that these processes are rather characterised by a collective search for solutions that are acceptable for the people involved and for those

who have some weight be it for the river engineering project or within the political environment.

As pointed out above, strong consensus orientation, particularly in cases where few municipalities were involved, clearly fostered agreements about the design and realisation of the projects. However, whether this benefited the extent of conservation measures was disputed. Whereas some interviewees argued that only by the means of intense communication land could be acquired which allowed for such measures, others pointed out that the strong ‘consensus orientation’ resulted in ‘losses for nature’. Also the involvement of specific interest groups such as farmers turned out to have a potentially strong impact on the outcome. In this respect, we found further indication for substantiating the claim that a strong representation of farmer’s interests can result in the omission or abandoning of restoration aspects of river engineering projects (Junker et al. 2007).

The main limitations and weaknesses of our study is that the roles of the interviewed persons were not similar in all cases investigated. For example, only in the case of Wyna we interviewed a person who clearly considered himself as someone who had lost in the process. For the other cases we were not able to identify such people – be it that there were none or nobody claimed to have lost, be it that such people were not indicated to us. Interviewing such “losers” might have resulted in a more critical assessment on our side, but does probably not reflect the actual overall quality of the outcome of this case in comparison to the other cases we investigated. Also, the Wyna-case is the most recent case and interestingly we found more signals of anger and frustration than in the older cases, particularly compared to the oldest case (Langeten). This indicates that people might have difficulties to recall the negative aspects, that they got resigned, or that positive effects covering up bad experiences are only unfolding later; it could also mean that the older cases were more harmonious, which we do not consider particularly likely. Another shortcoming of this study is that we only investigated successful cases, i.e. cases where a planning process resulted in actual agreements and the implementation of plans. There is a series of river engineering cases in Switzerland that ended in deadlock (Zaugg,

2005). The investigation of these cases would surely bring additional insights about the functioning of multi-governance, multi-purpose projects, but it is much harder to get participants for an investigation.

We have pointed out the important role of financial funds from outside these projects. Whether recommendations can be derived to other settings depends on the existing regulations in these settings. The laws regulating the creation of associations, foundations and trusts in Switzerland are considered liberal. In contrast, in countries with different formal institutional setting to Switzerland or with corruption as an important determinant of public life, foundations or trusts – if they existed - might not contribute to such multi-purpose projects. However, particularly in places where the government is not able to give incentives to conservation measures, private institutions might be the only actors who can steer activities in the direction of conservation.

We have presented Switzerland as a particularly land-scarce place. However, this feature might not be very specific to Switzerland. Prevalent and increasing conflicts over land (e.g. Sudan, Colombia, etc.) and land-grabbing, e.g., in Latin America and Africa indicate that land is more and more becoming a globally scarce resource. The specific competing interests or demands for land, however, might be very place specific. This leads us to the transferability of our results to non-river engineering contexts.

The main practical implication from our findings concerns the depth and stages of planning. According to the actors involved and interviewed by us, one success factor was a rough overall planning, the precision of the plans in subprojects, and the possibility to devise and implement such subprojects that are the least difficult to realise in the earlier phases of the project. These “easy” or “consensus” sub-projects have the advantage to not involve huge and big changes at a time, consequently the resistance they generate is comparatively small. And the general public will embrace and endorse the result with high likelihood. After having gained this approval at the sub-project level or local scale the realisation of bigger or more conflictive sub-projects will likely be easier to realise. Another practical implication of our research is that the project leader should have and communicate realistic expectation regarding the time requirement of such a planning

process. The time range between the event that triggered the planning process and the start of constructions was 10 to 14 years in our cases. Thus, we suggest that it is the responsibility of the project leader to communicate to other people involved in the planning process –and particularly to those with little or no experience—that the project will not be planned in a couple of years.

This research provided findings on the outcomes and decision processes behind multi-purpose planning projects in a multi-level governance setting in a developed country. To find out in what sense the results are specific to the particular setting (Switzerland) and to the particular ecosystem type in this setting similar studies should be conducted in other countries and in relation to other ecosystem-types and in combination with other non-conservation purposes.

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Table 1: Characteristics of investigated cases (own source, extracted from interviews)

	<b>Augand/ Kander</b>	<b>Flaz</b>	<b>Langete</b>	<b>Thur</b>	<b>Wyna</b>
<b>Canton</b>	Bern	Grisons	Bern	Thurgau	Aargau
<b>River engineering measures</b>	1300 m (widening)	4000 m (river relocation)	15 legs on a 15 km stretch	A number of widening measures on a stretch of 7 km	2 flood control basins + stretches of widening
<b>Type of land “loss”</b>	forest	agricultural	agricultural	agricultural	agricultural
<b>Number of municipalities involved</b>	2 (+1)	1	6	2	6
<b>Year of event that triggered project (project age)</b>	1995 (new)	1987 (middle-new)	1975 (old)	1987 (middle)	1995 (new)
<b>Number of years from trigger event to start of construction</b>	10	13	13	14	11
<b>Responsibility for river engineering</b>	municipality	municipality	municipality	canton	canton
<b>Extra/special funds for restoration</b>	yes	no	no	no	yes
<b>Supra-municipal institutions involved</b>	no	no	yes	no	yes
<b>Project costs in CHF Mio</b>	2.6	28	30	15	15
<b>Extent of politicisation of case</b>	0	0	0/+	++	+

Table 2: Contributing features to the success of the investigated cases and evaluation

	Orientati on towards consensu s	Leadershi p (vision and capacity to create stakes)	Willingn ess to invest time in negotiati ons	Existing trust relationships	Legal framework and administrative conditions on level canton and confederation	'External pressure' for engagem ent (flood risk, insurance , hanging approbati ons)
Augand/ Kander	+	++	+	++	++	+
Flaz	++	++	++	+	++	++
Langete	0	++	+	++	++	++
Thur	++(+)	+	++	0	+	+
Wyna	+	++	++	+	++	++

Legend: 0 – comparatively low value; + - high value; ++ - very high value

Table 3: Contributing features to the extent of conservation measures and evaluation

	<b>Partici- pants' willingnes s to learn</b>	Extent of resistance from land owners	Negotiated amount of land	Conservati on required by legislation	Extent of local responsi bility for ...	Extra financial resources for conservation (public and private)
Augand/ Kander	+	+	+	++	0	++
Flaz	++	+	++	++	++	++
Langete	++	+	0	0	+	-
Thur	++	++	+	++	+	+
Wyna	+	++	+	++	+	+

Legend: "0" – comparatively low value; "+" - high value; "++" - very high value;" "-  
- zero value