

# Task C4: Cases Comparative Analysis

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## 1. Introduction

This report contributes to the deliverable C4 of the CAPFLO project. It was developed by the University of Paris-East/Lab'Urba in collaboration with the CAPFLO partners. The document develops a comparative analysis of the social and civic capacities among the five study cases. The objective of this comparative analysis is twofold:

- Firstly, to compare the assessments of the social and civic capacities in each case; and
- Secondly, to elaborate hypotheses to explain the differences and similarities among the cases.

In order to address the first objective, we have elaborated two comparative tables using the Capacity Assessment recap tables of each of the study cases. These comparative tables were useful to identify the profile of each country and the similarities and/or differences among cases.

The comparative tables have been elaborated taking into account 3 aspects: (1) the social and civic capacities of the Flood Risk Management (FRM) institutions in each case study; (2) the social and civic capacities of communities and/or citizens in each case study; and lastly (3) the social and civic capacities deployed over time throughout the three stages of a flood event (ex-ante, during and ex-post) for each case study.

In order to achieve the second objective we have used the characterisation of the cases compiled in the C1, C2 and C3 tasks, which includes information on the flood risks in the areas, the socio economic activities, the system of actors and strategies, public participation and the assessment of capacities. This information was compared to identify explanatory variables.

The report is organised in the following way: we will first explain the material and methods used to elaborate the comparative analysis, then we will present the results of the comparative analysis for the three dimensions indicated above: the social and civic capacities of FRM institutions, of communities and citizens and in relation to the flood risk strategies. The third part will present the hypotheses, formulated as explanatory factors, which can be highlighted from the comparative analysis. Lastly, a conclusion will summarize the main outcomes of the analysis.

## 2. Material and methods

The material used for the comparative analysis is based on the case study reports: C1, C2 and C3 provided by each CAPFLO partner. Each of the partners was asked to elaborate a document that includes information of the specific cases. C1 refers to the geographical information of each case related to flood risks and characterisation, flood events, socio-economic activities, actors involved in the FRM structure, the flood risk management strategies and the assessment of capacities as stated in the B.4 document.

The methods to obtain the information to elaborate the study cases characterisation can be found in the B.4 document, some of the information required qualitative methods adapted to the specific contexts. C1 was prepared in July and field works for the capacity assessment were done from July to October, in some cases this process was longer than others, this was left up to each institution to decide.

The evaluation criteria were widely discussed among the CAPFLO partners and defined as much as possible to avoid differences in setting the capacity levels in the cases. However, as it concerns information on social issues it is not possible to evaluate in a perfect mathematical way. The information to evaluate, especially qualitative information, was established under the form of evaluative questions, leaving the decision for the choice of specific methods to the local experts/researchers, in a better position to choose the most adapted method to the specific context. The case studies used for the comparative analysis are available in the CAPFLO website (<http://capflo.net/case-studies/>).

The Capacity Assessment for each of the cases includes 12 indicators distributed in five different dimensions: knowledge, motivation, networks, finance and participation. They were developed following the definitions of three concepts: social capacity, civic capacity and adaptive capacity. The 12 indicators appear all together in the case recap table, a level of development from 0 to 3 is given as well as a degree of colour red, 0 corresponding to 'capacity non-existent' and identified with a lighter red colour, 1 to low level related to a stronger red colour, 2 to medium level, with an increasing shade of red colour, and finally 3 corresponding to a high level related to the darkest red shade. This recap table is useful to visualise the dimensions in which the capacities are developed and those which are under-developed. These dimensions are not separated from one another, on the contrary in some cases they are inter-linked and related.

In some of the cases (i.e. the Netherlands, Italian, German and Spanish) more than one municipality was considered. In these cases, the level of development of the capacities

(indicators) results from the average level of capacity. It is worth noticing that the German case presents very different levels of development in each side of the Iller River, especially concerning communities' participation. To see more details on the cases, look at the individual study case reports.

A second table was developed per study case, it shows the 12 indicators in the first column and the different strategies deployed before, during and after a flood event. The objective of this table is to show in which stage of the flood event the specific capacity (indicator) is currently present.

### **3. Comparing the Cases Capacity Assessment**

Two tables were assembled including the indicators and the five study cases. The first Table shows the capacity assessment of the Flood Risk Management (FRM) institutions (including government and non-government organisations). The second Table shows the capacity assessment of the civil society (CS) including communities and citizens. The Capacity Assessment Tool described in the B.4 CAPFLO report considered one table mixing FRM and CS; however, during the application of the tool the researchers realised that to differentiate both groups was required as these are different groups of actors with different levels of capacity development and roles. The cases show an important difference between the capacities embedded in the FRM institutions, usually higher, and that of the communities.

#### **3.1 Social and civic capacities assessment of FRM Structure (Institutions)**

The tables show first of all that there is a minimum of social and civic capacities in all the case studies. This is mainly valid for the institutions involved in the FRM (only few cases present levels between 0 and 1), but as we will see later, less straight forward for the capacities of the civil society (CS). This can be explained by the choice of study cases in which there is already awareness and/or attention given to the involvement of citizens in the FRM structure. Indeed two criteria have determined the choice of the study cases: firstly an area where population are currently exposed to flood risk, and secondly a municipality/civil society already engaged with flood risk management.

The Table 1 displayed below shows the capacity assessment for the FRM structure institutions for the 5 study cases.

*Table 1: Summary of capacity assessment in institutional actors*

Level of capacity development: 0 - no capacity, 1 -low level, 2 - medium level, 3 - high level.

The name given to the cases refers to the river, however it should not be forgotten that specific stretches are taken into account for the assessment.

Assessment tool indicators		Ebro (Spain)	Seine (France)	Trebbia (Italy)	Meuse (Netherlands)	Iller (Germany)
<b>K1</b>	Flood risk knowledge	2/1	3	2	3/2	2
<b>K2</b>	Learning capacity	1	3	2	2	1
<b>M1</b>	Motivation to mitigate flood risk	3	3	3	3	2
<b>M2</b>	Motivation to work collectively	2	2	3	2	0
<b>M3</b>	Motivation dynamics	2	1	3	3	2
<b>N1</b>	Network performance	2	2	2	2	2
<b>N2</b>	Network autonomy	2	2	2	2	1
<b>F1</b>	Insurance	2	3	1	1	-
<b>F2</b>	Community funds	1	2	1	3	2
<b>F3</b>	Funding innovation	0/1	2	1	2	1
<b>P1</b>	Community participation	1	0	1	2	2
<b>P2</b>	Participation dynamics	1	1	2	2	2/3

To start the comparative analysis, the differences and similarities were identified in each of the indicators; we can point out the following statements.

### ***Knowledge in FRM Institutions***

Knowledge on flood risk (K.1) is present in all the cases in a medium and high level of development which can be interpreted as a normal result as this is part of the main tasks and responsibilities of the FRM structure. In fact, and more generally, the indicators K.1, M.1, M.2, N.1 and N.2 regarding knowledge, motivation and networks are part of the expected functions of the FRM structure. Higher levels of capacity development in these indicators can be interpreted as: institutions are doing their job. The five cases, the levels of knowledge, and other expected capacities, from FRM structure are between 2 and 3, which mean that institutional structures have the expected capacities to do their job.

Learning capacity (K.2) is a different kind of indicator; it is related to social resilience and more particularly to adaptive capacity. For more details refer to the CAPFLO document B.4 page 9. Indeed, indicators K.2, M.3, F.3 and P.2 show resilience related capacities linked to the ability to overcome past experiences to do better in the future. In some cases, flood events are regular but communities are not using these traumatic events as a positive force to trigger change in the future; resilience related indicators are relevant to identify the capacity of FRM structures and communities to move forward in a positive way.

Regarding learning capacity (K.2), the French case presents a high level of institutional capacity which means that institutions are using events to learn and integrate experiences from the communities through the municipalities participation to workshops and learning spaces. However, if we correlate this capacity with indicator P.2, related to ability to change the FRM structure to integrate communities towards a participatory approach to flood co-management, which is low in this case, this means that even though the FRM institutions are going through a learning process, they are not capitalising the experience-based knowledge of citizens and communities to feedback their existing management approach.

The Netherlands and Italian cases have medium level of learning capacity. While the German and the Spanish cases present low level of learning capacity, which means that institutions are not capitalising experiences by integrating communities experience-based knowledge do better in the future. This indicator is low in the Spanish case despite frequent flooding events in the region and civil society groups with knowledge on floods (see indicator K.1 communities/citizens). This is an

unexploited potential in these cases, this relevant capacity needs to be further developed.

### ***Motivation in FRM Institutions***

Motivation to mitigate flood risk (M.1) and motivation to work collectively (M.2) are part of the expected capacities of the FRM institutions. All the cases present medium and high levels of capacity development, except the German case which presents no capacity to work collectively (M.2), an important gap in relation to other cases. The frequency of flood events can explain high levels of motivation in the Spanish and the Italian cases. In the Spanish case the high level of motivation is explained by the frequency of flooding events, but also by the existence of social conflict and pressing to the administration to find effective solutions.

The performance of the FRM institutions in the French and Netherlands cases can explain high levels of capacity development. The Italian case has also high levels of motivation to work collectively which might be seen as a potential to form new flood networks. Nonetheless, levels between 2 at 3 can be interpreted as an expected behaviour of FRM institutions.

Motivation dynamics (M.3) is an indicator of resilience; it refers to the capacity to capitalise a traumatic experience in the past to change in a positive way the FRM rationale and functioning for the next flood event. To change mind-set and behaviour is not an easy task to achieve. Regular flood events can trigger change, but in some cases despite recurrent traumatic events the status quo might remain unchanged. The Italian case presents a high level of capacity to change towards a positive, constructive approach as well as the Netherlands case which has a strong culture of managing floods. This capacity can open opportunities to find new approaches and tools to improve the current situation in the future.

The Spanish and German cases have medium levels, while the French has a low level of M.3 capacity development. In the Spanish case it is interesting to notice that frequent flood events are not directly related to high levels of motivation dynamics (M.3) this is, capacity to change flood risk perception (mind-sets) and increase motivation and actions to mitigate flood risk.

In the French case low level of M.3 can be explained on one hand by the lack of regular flood events and on the other hand by well-established structures of FRM that have been working since many years on setting defence measures to protect the population and that are not very open to change towards a participatory risk culture, which implies a long term social transformation process.



### ***Networks in FRM Institutions***

As far as networks working on flood are concerned (N.1 and N.2), there is a medium level of development in all the five cases. N.1 in the German case is low. Medium levels of development can be related to the fact that FRM is an old structure in these countries, institutional actors know each other as they have been working together for a long time. These indicators are part of the expected capacities of FRM institutions.

It is worth noticing that the Italian case which shows higher level in the motivation related indicators have not equal levels of development in the networks ones. In one hand this can be explained by the fact that motivation to work together is higher during flood crises than in the ex-ante phase and on the other by the fact that the opening of the FRM system to non-institutional actors is rather recent. Furthermore, at local level, civic protection has been mainly a municipal based policy. Only recently have civic protection competences been devolved to Union of municipalities. Some steps towards the development of networks in this area at the sub-basin level have already been take with the creation of a coalition of mayors promoting the Arturo flood risks management app and the opening of the FRM system to citizens. Drawing on the the existing motivational potential, the participatory tool (Task E) could be used to enhance this process.

### ***Finance in FRM Institutions***

The last two dimensions, corresponding to finance and participation, have different levels of development among the cases.

Insurance indicator (F.1) is related to how flood crises in each region or country is organised. In France private insurance is compulsory for residents and the insurance companies and associations are actively involved in the FRM structure. Insurance companies contribute to create natural disaster funds and provide information to communities on how to prepare for a flood event, which reduces costs for them, thus the level of insurance is high. In the other cases, it doesn't matter if one country doesn't have a compulsory insurance system as far as there is some system to ensure funds available for post disaster recovery at the level of municipalities and individuals.

The Table 1 shows that the Netherlands case has low levels of insurance, this is related to their particular insurance system. In the German case no ranking is given because this is a particular insurance system too. The Italian case has lower levels in the financial dimension (F.1, F.2 and F.3) which reveals an important vulnerability. The literature review has shown that availability of funds is essential for the recovery stage,

and equally important in the preparedness stage to reduce damage (Dzialec et al. 2013, see B.4 document reference section). In the Spanish case, there are funds for the recovery stage and for the emergency management (less funds for prevention and defense) but there are not for community actions, in this case level of capacity is medium.

Community funds (F.2) and funding innovation (F.3) are relevant capacities to support communities' and citizens initiatives to mobilise, self-organise and persist as a community working together over time. In some of the cases funding innovation exists, mainly in the recovery stage, but not directed to communities to self-organise. If self-organisation capacity is to be fostered, funding is a necessary resource missing in most cases. In general, lack of funds for communities is a weakness in all the case studies, especially in the preparedness stage.

#### ***Public participation in FRM Institutions***

Citizens/ communities participation in decision-making processes present in general lower levels of development (P.1). FRM has been managed historically in these countries by public authorities. Communities' and citizens' involvement in the structure is a recent approach.

In the Netherlands and German cases, public participation in the decision-making processes has medium level of development. These are the cases that present higher levels of capacity development. In the German case, participation dynamics (P.2) is particularly high (ranked level 3- high) in the case of Baden Wurttemberg (BW).

The Spanish and Italian cases present a low level of participation (P.1) despite higher levels of motivation to mitigate flood (M.1), work collectively (M.2) and use past experiences to change risk perception (M.3). The Spanish case has level 1 in participation (P.1) because of the community involvement during the flooding event. This can be interpreted as the FRM institutional structure not using the communities' motivation to proactively involve them in the decisions concerning flood risk management.

The French case capacity to involve communities in the decision making processes is zero, this is because the French political system is a representative one in which local authorities take the decisions on behalf of the citizens. The relation built over time between the multiple levels of government and the citizens can be pointed out as a main explanatory factor of the differences among the cases in terms of participation.

In relation to the participation dynamics (P.2), an indicator related to the capacity of the FRM to re-organise in order to give a role to citizens and communities, we see an

important difference in the level of development among cases. In the Spanish and French cases the level remains low. This can be interpreted as a difficulty to change from an interventionist approach to flood risk management towards a participatory one. In the German case average ranking is medium level but as said before the BW case presents high levels of development.

In Italy and the Netherlands cases the level of development of this capacity is medium. This means that these two cases are doing already a noticeable progress in changing the FRM structure to involve the communities and their resources.

An important finding regarding participatory processes in the study cases is the relevance of the role played by the municipality to involve citizens and communities, come up with innovative tools, build trustful relationships with citizens and capitalise experience-based knowledge from grassroots to be included in the FRM system. It is indeed the municipality which seems a key actor to start a participatory process of capacity building, this is clearly shown in the German-BW case. The success of the process seems to depend to a large extent in its own involvement and engagement.

**To sum up** almost all cases have a medium or high level of capacities expected from the FRM institutions, these concern the K.1 (knowledge), M.1 (motivation to mitigate flood), M.2 (motivation to work collectively), N.1 and N.2 (networks performance and networks autonomy), only the German case has zero capacity to work collectively. In relation to the indicators related to resilience, the levels of capacity development vary among the different cases. The more striking results is the low level of learning capacity (K.2), this is capacity to integrate experienced based knowledge from communities in the Spanish and German cases. In the Spanish case this capacity is still low despite regular flood events, higher levels of motivation to mitigate flood and to work collectively. The French case is doing well in learning (K.2) but there is a weakness in the capacity to change flood risk perception and approach (M.3) and involve communities and citizens in the FRM decisions (P.2). All the cases present a problem of community funds to take their own initiatives (F.2), in the cases in which this indicator is higher, this is related to the funds given to the communities during the flood event and recovery. This aspect is better explained in the analysis concerning the capacities in the different stages of a flood event (Table 3).

In relation to participation dimension (P.1), particularly relevant for the CAPFLO project, three profile groups can be identified: (1) the French case shows no capacity to involve communities in the decision-making process mainly due to its representative system, (2) the Spanish and Italian cases have lower capacity development in participation despite higher levels of the population motivation to mitigate flood risk

and work together, and (3) the Netherlands and German cases have medium levels as the FRM structures have engaged processes to involve citizens. As a major finding, we observe that the role played by the FRM institutions, especially the municipalities, is important to ensure the involvement of the citizens and communities in the participatory processes of decision-making.

### **3.2. Social and civic capacities assessment of communities/citizens**

In this part, a comparative analysis of the five study cases is presented; the analysis refers to the different capacities of the communities (civil society) with the 12 Capacity Assessment indicators.

The Table 2 below presents the indicators and the level as indicated in each recap table in the study cases. A reminder: the (civil society) communities were separated from the FRM structure assessment to evaluate separately their capacities and level of development; the CAPFLO social capacity building project focuses mainly in these communities.



*Table 2: Summary of capacity assessment in communities/citizens*

Level of capacity development: 0 - no capacity, 1 -low level, 2 - medium level, 3 - high level

The name given to the cases refers to the river, however it should not be forgotten that specific stretches are taken into account for the evaluation.

Assessment tool		Ebro (Spain)	Seine (France)	Trebbia (Italy)	Meuse (Netherlands)	Iller (Germany)
<b>K1</b>	Flood risk knowledge	2/1	1	2	2	1
<b>K2</b>	Learning capacity	1	1	1	2	0
<b>M1</b>	Motivation to mitigate flood risk	3	0	3	1	1
<b>M2</b>	Motivation to work collectively	2	1	3	2	1
<b>M3</b>	Increase motivation	2	1	2	1	0
<b>N1</b>	Network performance	2	0	2	2	1
<b>N2</b>	Network autonomy	2	0	1	2	0
<b>F1</b>	Insurance	2/1	3	0	1	2
<b>F2</b>	Community funds	1/0	1	1	3	-
<b>F3</b>	Funding Innovation	0	0	1	1	-
<b>P1</b>	Community Participation	1	0	1	2	1
<b>P2</b>	Participation influence	1	1	1	2	0

The Table 2 shows lower levels of capacity development in all the cases if compared to the FRM institutions, especially the French and German cases. Only few capacities have higher levels, especially regarding motivation to mitigate risk or motivation to work collectively in the Spanish and Italian cases.

In the paragraphs below, the results of the analysis are presented by capacity dimension.

### ***Knowledge in communities***

Most cases show that communities have medium level of knowledge on flood risk (K.1) except from the French and German cases in which this capacity is low. This medium levels might be explained by the kind of settlements (rooted communities) exposed to flood since a long period of time as is the case of the Spanish, Netherlands and Italian cases. In fact, populations exposed to flood risk have developed a culture of rivers and know their environment, especially those related to agriculture. However, in some cases risk has changed and the knowledge they have of risk is not actualised to new challenges, as in the case of the Netherlands case communities.

It is worth noticing that in most cases 'communities' are not an homogenous category and there are groups within communities with less knowledge on risk, vulnerabilities such as language or age than others members.

Learning capacity (K.2) is medium in the Spanish and Netherlands cases, while it is low in the French and Italian ones. The German case presents no learning capacity at all. It is worth mentioning that in the French case, while communities have a low level of learning capacity, institutions have a high level. This means that learning processes are not including communities and citizens but they are taking place within FRM institutions. In the other four cases the gap between communities and FRM institutions exists but it is not that important.

### ***Motivation in communities***

In the Spanish and Italian cases, communities' motivation to mitigate flood (M.1) is high due to the regular confrontation to floods in these cases, particularly violent and rapid as in the Italian case. This dimension has a low level of development in the Netherlands and German cases. Motivation to mitigate flood is zero in the French case, mainly due to lack of floods and over-trust in the protection of the lakes (reservoirs) constructed some decades ago.

Motivation to work collectively (M.2) is low in the French and German cases. The Spanish and Netherlands cases present a medium level of this capacity, while the

Italian case presents a high level. Motivation to work collectively (M.2) is a very important potential to develop other capacities such as networks and participation capacities. In fact, there is a relationship between the indicators M.1 (motivation to mitigate risk), M.2 (motivation to work collectively), N.1 and N.2 (networks performance and autonomy) and to P.1 (communities' participation) if the FRM institutions use communities' capacities and involve them in the decision making processes and support their actions and initiatives.

Capacity to increase motivation (M.3) is low in the French and Netherlands cases, it is zero in the German case, and medium in the Spanish and Italian cases. This is an indicator related to resilience as well as K.2, F.3 and P.2. Capacity to use past events in a positive way to improve attitude and behaviour in the future. M.3 is an important capacity to trigger capacity development processes in other dimensions. It is worth noticing that in some cases flood events have not been used as learning experiences to strengthen existing capacities and develop new ones. Regular confrontation to flood events does not automatically lead to the development of this particular capacity.

#### ***Networks in communities***

Networks are an important potential to be used to transmit other resources and capacities among FRM institutions and communities, and within communities themselves. The Spanish, Italian and Netherlands cases show a medium level of capacity in the networks dimensions (N.1 and N.2); these three cases have networks in both FRM institutions and communities. The Italian case is peculiar, as community networks are developed in the plain part of the sub-basin where civic protection associations have a consolidated story, while in the mountain part of the sub-basin they barely exist. The German case shows low level of networks performance (N.1) and no networks autonomy (N.2). The French case shows no communities' networks involved in flood risk. This result reflects the difficulties for communities/citizens to be involved in formal and active networks within institutions in the German and French cases.

The Spanish case shows motivation to mitigate risk related to a medium level of networks working on flood mitigation and autonomy. This means that motivation is not only related to risk perception but also to behaviour: communities are actually integrating networks to mitigate risk. The same happens with the Italian case. In the Netherlands case, motivation is slightly lower mainly due to over-trust in structural measures, but there are networks with a medium level of capacity. The French case has no motivation and no networks, and the German case has low level of motivation

and no networks. Communities' motivation and existence of networks are an important potential for the Spanish and the Italian cases.

#### ***Finance in communities***

The indicator related to individuals' insurance (F.1) is a tricky one, as this depends on the national insurance system and funds in case of natural disaster. In the French case, for example, individual insurance is compulsory which means all the population is protected against a disaster. In addition, insurance companies participate actively in the FRM to gather collective funds to be used in case of major disaster (Cat-Nat). In each country the system is different. It is important to understand how the population get funds to recover in case of a flood event.

Regarding community funds (F.2), the French and Spanish cases are weak in this aspect. The Netherlands case is doing better than the others; this case has a high level of community funds which can explain maybe the level of networks. In the Italian case, community funds are mostly available in the recovery phase, in the ex-ante phase limited funds are available only to (civic protection) associations. It's worth noting that in the recovery phase, in some municipalities of Trebbia sub-basin, citizens have created local committees engaged in community fund raising for the reconstruction of public places/spaces affected by floods. However, in general funding innovation (F.3) has zero or low level of development. Community funds (F.2) and funding innovation (F.3) are necessary to support capacity development of communities, self-organisation initiatives and specific actions; without this resource it would be very difficult to help them engage with FRM.

#### ***Participation in communities***

The Netherlands case is the one doing better in this dimension with medium level of development. The French case has zero capacities in communities' participation in the decision making process (P.1); the German case has low level in P.1 but zero in P.2 participation influence. The Spanish and Italian cases have low level. The Spanish and Italian cases have medium/high levels of motivation and networks, while participation is low, this relationship worth further explanation, especially in relation to the role of the FRM institutions in involving the communities.

The capacity to change the FRM structure to involve communities (P.2) is only taking place at a medium level in the Netherlands case; the other cases present a low level of capacity. This can be interpreted as an important limitation to develop participatory processes that involve communities in the decision making process and help them self-organise and undertake initiatives to mitigate flood risk.



**To sum up** we can point out the fact that there is a real discrepancy between institutional capacities, in general higher, and those of the communities/citizens. This is true for all cases except the Netherlands and the Spanish cases. From such a statement we can first formulate the hypothesis that the high level of capacities of the institutions is related to the low involvement of communities/citizens. In the frame of a welfare state the public responsibility for protecting the population can explain such a relationship. Secondly, such a discrepancy let us plead for the development of participatory processes in order to involve those communities/citizens in FRM.

### 3.3. Case study profiles

In this part of the analysis four different profiles are presented. To build the profiles we used major explanatory factors and relate them with the development of the different capacities using the cases to support the statements. To develop the profiles we took into account the cases strengths and weaknesses.

*Profile A. Limitations of rooted communities with higher levels of experienced-based knowledge (K.1) and its relationship to participation (P.2).*

Two cases show this statement: the Spanish and the Netherlands cases. In the Spanish case there are some civil society groups with rooted knowledge on flood risk, mainly farmers and ecologists. However, these groups have opposing views with mainstream FRM approaches, which is producing social conflict and restraining further capacity development especially in motivation to work collectively (M.2), networks development (N.1, N.2) and eventually preventing spaces for participation in the decision making processes (P.1).

The Netherlands case has also a well-established culture of the river and its risks very much integrated in the society mind-sets and behaviour. In this case, flood is part of the culture and history; rooted communities have knowledge of the phenomenon and have a sensitive understanding of their environment (socio-territorial factors). However, a new project is changing the river landscape which is changing also the nature of flood risk; not as a slow phenomenon regularly happening as before but rather a violent one when the new dikes will be over flooded. A similar experiences was observed in the Spanish case before the 2003 floodings. The experience-based knowledge of the communities becomes dangerous as it makes them rely on false beliefs of flood that need to be actualised. It seems relevant that experiences based communities' knowledge is updated within larger learning processes.

The second important dimension for the case of Meuse River relates to the availability of community funds: as stated in the report, right after the 1993 and 1995 floods donations and emergency funds were used to repair the damages in the villages and to make the communities more resilient. However these funds were not used in the ex-ante phases of flood.

Finally, we can notice that the Netherlands case is the only one that has a balance between capacities in institutions and those of communities/citizens; this is very relevant as they seem not as disconnected as in other cases. The Spanish case has a similar relationship with lower levels of capacity development. In the Netherlands case, a balance between FRM institutions and communities can be explained by their history and relationship to the place over time and by the recent collaboration between institutions/communities, despite conflict in the past. This can explain existence (medium level) of institutions/community networks, and (medium level) of participation in decision making processes.

*Profile B. Higher levels of communities' motivation (M.1, M.2) and networks (N.1, N.2) related to regular exposure to flood events.*

The Italian and Spanish cases show that regular flood events increase motivation to mitigate risk (M.1) and development of networks (N.1, N.2). In a less straight forward relation flood events can influence motivation to work collectively, especially during the flood event (M.2) and under some circumstances motivation to change risk perception and capitalise traumatic events into a positive opportunity to build capacity to undertake actions (M.3). The motivation to mitigate risk (M.1) is high in the case of the Ribera Alta del Ebro (Spain) in both institutional and communities/citizens category. This level of motivation can be related to the regular exposure to flood episodes which occurred several times during the last years. This case can be compared to the Trebbia case (Italy) where motivation to mitigate the risk is also high ranked, especially by the institutions and communities'. In the Italian case, there is also a high level of motivation to work collectively (M.2) and medium level of capacity to change risk perception and increase motivation after each flood event (M.3).

Nonetheless, these capacities (motivation and networks) are not related to the level of communities' participation in the decision making processes. This means that if a process to develop motivation and networks exclusively in the communities' side is engaged, it will not directly imply that communities/citizens will increase their participation in FRM as a matter of fact. We believe that a capacity development process, as a dialectic process, is also required in the FRM institutions side in order to be able to involve the communities in the FRM structure.

*Profile C. Higher levels of FRM structure institutional capacities (knowledge, motivation, networks, and finance) related to territorial stakes and political power.*

This statement is shown by the French case. In fact, Paris is the capital city of France with undergoing strong urbanisation processes in its territory (i.e. the Grand Paris); especially concerning the near periphery (Vitry is included). The political will to protect this territory and keep control over flood risk and its management can explain the development of strong institutions. On the other hand, it can also explain low levels of communities' participation capacity, especially the limitations of centralised institutions struggling to share power and decisions with citizens.

In the case of Vitry (France) higher levels of motivation and knowledge in institutions cannot be related to flood episodes, as there haven't been important flood events in the last years. In fact, the Seine river basin has well established institutions (this is the capital city), and multiple tools coordinating different scales (such as plans and simulation exercises) and exchange/ learning spaces (such as the Ateliers PAPI and Sequana exercises) which explain high levels of knowledge (K.1), learning (K.2), motivation to mitigate risk and work collectively (M.1, M.2) and as well as networks (N.1, N.2) in institutions. The importance of the stakes in case of Flood (Vitry is located in the Parisian region which would be importantly affected in case of flood). Moreover, the insurance dimension is also high ranked in the case of Vitry as a national system is implemented able to cover the risk related to flood for individuals.

*Profile D. Higher levels of participation (P.1) developed within medium and low level of capacities in FRM institutions and low levels in communities.*

In the German case studies, Iller river in Baden Wurttemberg (BW) and Bavaria (BY), there are very different levels of capacity development in both, the FRM institutions and the communities. A higher levels of capacity development are observed in the Baden Wurttemberg (BW) case, however, in general levels are between low level and medium level for institutions, and between low level and zero level for communities. Only one indicator outstands which is a high level of participation (P.1) in BW, which is ranked medium in the table due to the consideration of the other case in an average value.

An interesting finding of this case/profile it that participation in the decision making process was started by authorities despite lower levels of capacity development in the institutions and the communities (learning, motivation to mitigate flood risk, motivation to work collectively, to increase motivation, no existent networks, and no community funds for local initiatives). This case reveals the importance of the FRM

institutions to promote or create spaces and processes that trigger communities' and citizens' participatory processes.

**To sum up** there are four explanatory factors that define the profile of the cases as well as the development of certain specific capacities. The Spanish and Netherlands cases shows the limitations of experiences-based knowledge of rooted communities, especially the Netherlands case in which landscape transformation in recent years has changed the nature of flood risk making obsolete the old beliefs of the population. In the Spanish and Italian cases, higher levels of motivation and networks capacities are related to regular and/or violent flood events. The French case shows that higher levels of capacity development in institutions are enhanced by a political will to protect an important territory, in this case the capital city. A system of well-established institutions form the FRM structure which keeps control and manages flood risk in this important territory. On one hand the FRM structure would like to integrate communities' initiatives, given them decision-power and responsibilities; on the other hand, in practice this is a difficult task to achieve and enters into contradiction with a logic of centralisation and efficiency of the structure. The German case shows the relevant role of the local authorities to start a participatory process with the communities despite lower levels of capacity development in the other dimensions in both the institutions and the communities.

The profiles presented above are based on the strength in the various capacities in each case. As a matter of fact, there are only few zero ranking capacities (at least for FRM institutions). Communities' participation is in general low, it is the case for most of the cases: only the Netherlands case have medium levels; and Germany case have a medium level as well for participation of communities in decision making in FRM institutions, whereas Italy has a good level in P.2 but not in participation in decision making P.1. On the basis of the case studies report, this can be related on one hand to a lack of political will to give decision power to communities, especially in the FRM, and also on the other hand to a strong culture of citizens' disenfranchisement regarding flood risk.

#### **4. Comparing the capacity related to FRM structure**

This part presents the last comparative analysis of the capacity assessments applied to the five case studies. The analysis takes into account the specific phase of the flood event (ex-ante, during or ex-post) in which the capacities are currently expressed. The Table 3 shows the capacity dimension and the 12 indicators in the first two columns, then the different stages/strategies of the flood events. The cases initials appear in black when the capacities are taking place in a specific stage, they appear in red when,

the case is lacking capacity development in a specific stage/strategy of flood management. In some cells, especially in the 'prevention' and 'defence' columns, not all the case initials appear; they appear in black when capacities are currently taking place in these phases. In these cases, red initials do not appear as they are not particularly relevant for the aim of the CAPFLO project. For example, knowledge capacity (K.1) in the civil society (CS) concerning the construction of dikes (this is an example of ex-ante, defence measures) is not relevant, as this is a highly technical issue. On the other hand, knowledge about the characteristics of flood, how to behave during a flood, when to evacuate etc. are ex-ante, preparedness measures relevant to the CAPFLO project. Thus, initials in red appear if capacities are lacking in the study cases.

The Table 3 shows the 12 CAT indicators applied separately to the FRM structure and to the civil society/communities (CS). Seven categories of capacities were created to facilitate the interpretation of the results; the categories are explained in the legend below the Table. In the cases in which a relevant capacity is missing the initial letter of the case or cases are marked with red colour.

A reminder: the CAPFLO project focuses mainly in building capacities in the prevention stage, for this reason the FRM and CS columns corresponding to this stage are highlighted with a black frame. The CAPFLO project has defined specific strategies for prevention, defence and preparedness stages, please refer to deliverable B.4 for exact definitions. Capacity development is however connected with the different stages of a flood, for that reason it is considered important to see the expression of capacities over time.



Table 3: Role of relevant social capacities of FRM structure and civil society

Dimension	Indicator	Ex-ante						During		Ex-post	
		Prevention		Defence		Preparedness		Response		Recovery	
		FRM	CS	FRM	CS	FRM	CS	FRM	CS	FRM	CS
Knowledge	K1 Flood risk knowledge	S/N/F/I/G		S/N/F/I/G	F/G	S/N/F/I/G	I/G/S/F/N	S/N/F/I/G	S/N/I/G/F	S/N/F/I/G	N/I
	K2 Learning capacity	S/N/I/		S/I		S/N/F/I/G	S/F/I/N/G	S/N/F/I/G	S	S/N/F/I/G	S/F/I/N/G
Motivation	M1 Motivation to mitigate FR	S/F/I		F		S/F/I/N/G	S/I/F/N/G	F/I/G	I/G	F/I/S/G/N	I/S/F/N/G
	M2 Motivation to work collectively	S/F/I	S	F		S/F/I/N/G	S/I F/N/G	S/F/I/G/N	S/N/F/I/G	S/F/I/N/G	S/N/I/F/G
	M3 Increase motivation	S/I/G				F/I/G/S/N	S/I F/N/G	I/S/N/F/G	S/I/N/F/G	I/S/N/F/G	I/S/N/F/G
Networks	N1 Network performance	S/N	S	N/I		N/F/I/S/G	I/F/N/G/S	S/N/F/I/G	S/N/I/F/G	S/N/I/F/G	S/N/I/F/G
	N2 Network autonomy	S/N	S	N/I		S/N/F/I/G	S/N/F/I/G	S/N/F/I/G	S/N/I/F/G	S/N/I/F/G	S/N/I/F/G
Financial resources	F1 Insurance					F/I	F/S/I/N/G	F		F	F/G/I/S/N
	F2 Community funds	S/N/I		N/I		N/F/I/G/S	S/N/F/I/G	N/I/G/F/S	N/G/S/I/F	S/N/I/F/G	N/I/S/F/G
	F3 Funding innovation	N		N		N/F/S/I/G	S/N/F/I/G	N	N	N/S/F/I/G	N
Participation	P1 Community Participation		N	F	N	I/G/F/S/N	N/I/S/F/G	I/G	S/I	I/F/N/S/G	I
	P2 Participation dynamics	N		N		N/F/I/G/S	S/N/F/I/G	S/N/F/I/G		N/I/F/S/G	F/I/N/S/G

The red letter means that there is a lack of a relevant capacity in that case or cases.

- Expected capacities of FRM institutions
- Relevant CS capacities to adapt behaviour in case of crisis
- Networks capacity to transmit resources and abilities, especially knowledge, motivation and funds
- Capacity to capitalise past experiences to change FRM structure in the future, resilience related capacities
- Capacity to capitalise past experiences to change CS/communities behaviour in the future, resilience related capacities
- Funds (Insurance co. funds, individual insurance, and collective funds for communities)
- Capacity to integrate communities/citizens in FRM decision-making processes and CS capacity to respond to the role

The comparative table allow us to outline several points.

First of all, the FRM structure has more capacities, expressed throughout the flood event, than the CS which deploys capacities mainly during the crises but lacks capacities in the mitigation stage. This is a normal behaviour to a certain extent as historically it is the FRM structure responsibility to be in charge of disaster management.

FRM structures in all cases have knowledge (K.1) in all the stages of food. FRM structures have also have motivation to mitigate flood (M.1). The FRM structures are also doing well in terms of learning capacity (K.2). The Netherlands and German cases are having difficulties to develop capacities to work collectively in the preparedness stages of a flood event, capacities are expressed during the flood event but not in the ex-ante or recovery stages.

CS lacks knowledge on flood risk with exception of the Italian and German cases. An important result is that there are no learning capacities in the recovery stage in any of the cases from the CS side. This means that communities and citizens do not have spaces or they are not participating in the feedback processes engaged by the FRM institutional structure to use their experiences to do better in the next flood event.

CS in all cases shows capacity to work collectively during the flood event, and in few cases in the recovery stage; however, this capacity is not capitalised in the preparedness stage, especially in the Netherlands, German and French cases. In the Italian and Spanish cases, where floods have been more regular and violent (the latter concerns the Italian case), CS has motivation to work collectively in all the stages of the event. These two cases have capacity to increase their motivation to prepare for the next flood event. This means that not only CS has less capacity than FRM structures but also that these capacities are not linked throughout the different stages of the event nor capitalised for the next event.

Networks working in FRM, preparedness stage, are present in the French, Netherlands and Italian cases. In the Netherlands and Italian cases, communities (civic protection association in the Italian case) are included in the FRM networks, this is not the case for the German and the French cases. The Spanish, Netherlands and Italian cases have networks working mainly in the 'during' and 'recovery' stages from both, FRM structure and CS groups. On the contrary French and German cases have no CS networks in the 'during' stage nor in the 'recovery' one. The Netherlands case has networks from both groups in almost all the stages of a flood event. It is particularly relevant to see that CS networks capacities are missing for all cases in the preparedness stage with exception of the Italian case, where they are limited to civic

protection associations, especially in the plain part of the sub-basin, even though they are rather low. Networks are particularly important to transfer multiple resources and abilities. The French and German cases present vulnerability in relation to the lack of networks.

CS in all cases lacks capacity to have networks' autonomy and funding innovation, these are 'high level' capacities that require a strong bonding, experience and motivation to be developed. These capacities are important indicators of communities' self-organisation. The flood mitigation topic doesn't seem to trigger this kind of capacities in the population.

There is an important gap in the individuals' insurance, which is important for individuals to recover from a flood event. Only the French and Spanish cases presents this capacity. Insurance companies' funds are also missing in the other cases. This might represent a vulnerable aspect, as funds are very important in the preparedness-recovery phases but depends on how funds are organised in case of an event.

Communities' participation in the flood risk decision-making processes taking place in preparedness stage is a capacity missing in many cases, namely in the Spanish, French and German cases from both the FRM structure and the CS sides. However, it is worth noticing that participation changes in all the cases during the flood, it seems the FRM structure is able to integrate citizens and communities to help manage the crisis.

**To sum up**, here again we can outline various profiles arising from the capacity assessment exercises applied to institutions and communities. Following the growing importance of the capacities we can outline:

The case of Riviera Alta del Ebro in Spain seems to have a very specific pattern: the institutional and civil society capacities relate mainly on knowledge dimension (for all the stages of FRM) and in the response stage (for most of the dimensions).

This case contrasts with two other cases: Vitry in France and Iller river in Germany (on the badenwurttemberg side only): these 2 cases present a more or less similar pattern where capacities focus on preparedness and response stages with stronger capacities in the former than in the latter.

The two last cases Meuse basin Limburg in the Netherlands, and Trebbia River in Italy present a pattern where the capacities are much more diversified throughout FRM phases and especially strong for the network dimension. However, it has to be noted that in the Italian case capacities in the preparedness phase are embedded only within public institutions and civic protection associations. In the Meuse basin Limburg capacities are especially strong for the network dimension.



These differences between the cases can be related to focus given within this study: the social and civic capacities are more easily developed for the response and preparedness stages. But the Meuse basin case shows that the capacities can be more widespread among FRM stages. The challenge for the other cases is to use capacities expressed during the flood events in the preparedness and recovery stages more in an iterative, adaptive process than just as a short term, exceptional event. The capabilities in this case can be related to the fact that flood represents a rooted policy. In fact, in the Limburg case, flood policy is an old and important one in the Netherlands.

## 5. Interpretations

As mentioned before, an important objective of the comparative analysis is to build explanatory hypotheses, especially those related to the next tasks of the project concerning the 'participatory capacity building' process and its limitations. We propose below to summarize the main explanatory factors that stem from the material reported in the C1, C2 and C3 reports of each case study.

- There is a relevant difference between the level of capacities embedded in FRM institutional actors, usually higher, compared to that of the communities/citizens. Therefore, there is a disconnection between these two groups of actors. This is valid in all the CAPFLO cases except for the Netherlands and Spanish cases in which capacity levels are similar in both groups. In the French and German cases the discrepancy between the two categories is particularly accentuated. This can be explained by the FRM structure and organisation, the territorial challenges and stakes, and the relationship between the specific communities/citizens to local authorities over time.
- Communities' participation in decision-making processes (P.1) is not related to higher levels of communities' knowledge (K.1), motivation (M.1, M.2) and networks (N.1, N.2), as we could expect. This is clear by looking at the Italian and Spanish cases in which knowledge, motivation and networks are rather high but participation in decision making (P.1) is still low. This can be explained by the incapacity of both: institutions inability to integrate civil society actors to the FRM structure and communities'/citizens' inability to (demand) take a more prominent role by themselves.
- A higher level of communities' participation (P.1, P.2) is mainly related to the FRM structure, its resources and specific capacities rather than to the communities' ones. This can be observed particularly in the German case. The Netherlands case

presents a balanced relationship authorities/communities with medium levels of participation, already “good” in relation to the other cases in which levels are very low.

- Despite the organisation of the particular FRM structure per country/region, the municipalities play a critical role in establishing a close relation with the communities/citizens in order to integrate local knowledge to the FRM, listen to their needs, build a relationship of trust and cooperation and facilitate provision of resources and abilities to them. These resources and abilities include knowledge on flood risk and adapted behaviour. Furthermore, the role played by the mayor and the municipality can make a difference in creating spaces and triggering participation processes. In the German case for example we have very different participation capacities level in one side of the river in comparison to the other side.
- There is an important cultural paradigm that can enable or prevent the communities’ ability to develop a self-help culture in order to undertake actions to mitigate flood risk. Despite higher levels of knowledge and motivation to mitigate risk, citizens might delegate actions to the institutions. Mind-set and behaviour is not easy to change, even for those communities exposed regularly to flood events. Indicators related to resilience (especially K.2, M.3 and P.2) are particularly interesting to understand potential for future change based on the behaviour in the past. The Italian case, especially its FRM institutions, has higher levels of capacity to change than the other cases.

## **6. Conclusions to be used in the next tasks of the CAPFLO project**

The comparative analysis presented in this document focus mainly in the Capacity Assessment of the five CAPFLO cases. It should be taken into account that these cases have different characteristics, especially concerning two main factors (1) territorial context including typology of the river overflow (e.g. Paris metropolitan area with infrequent flood events in the French case, mountain and plain towns with violent flash floods in the Italian case, small villages with slow flood regular events in the Spanish case, etc.) and (2) a specific FRM structure working at multiple territorial scales (national, regional, local). These two variables, developed extensively in the case reports, are directly related to the level of development of the different social, civic and adaptive capacities reflected in the assessments.

Below are presented the main findings of the comparative analysis to be used in the next tasks of the CAPFLO project.

- *FRM institutions and communities: a dialectic capacity building process*

As the comparative analysis was taking place, we realised how relevant it is to differentiate between the assessment of the FRM institutions and that of the communities (civil society). The initial Capacity Assessment was focusing mainly in the communities' capacities (see B.4 report). Nonetheless, the cases comparative work revealed that these capacities embedded in the civil society are directly related to the flood typology and to the capacities embedded in the FRM structure itself, and cannot be seen as completely independent variables. For example, it was very clear that when FRM mitigation approach is strongly focused in the construction of defence measures (lakes, dikes, etc.), the population tend to lower their levels of motivation to mitigate flood risk, knowledge on flood risk, motivation to work collectively, formation of networks, etc. as they feel fully protected by these measures.

Thus, the first important finding of the comparative analysis is the dialectic, interdependent relationship between the capacities of the FRM structure and that of the communities. In other words, to build social and civic capacity, the participatory process of capacity development has to address both groups: FRM institutions and communities.

Nowadays, all the cases present an important gap between the FRM structure levels of capacities, in general higher, than those of the communities, which in most cases are low and only expressed during the flood event. The exception to this is the Netherlands and Spanish cases. These cases have rooted communities with higher levels of motivation and knowledge. The Netherlands case has in general higher levels of capacities in the different dimensions compared to other cases. These capacities have been enhanced by a recent participatory process, namely communities' capacity to work collectively and participation capacities. In fact, this case is the only one that presents medium levels in the participation indicators (P.1 and P.2) and higher levels of capacity in communities (K.1 knowledge, K.2 learning, M.2 motivation and N.1, N.2 networks).

Some capacities are particularly important in this dialectic process. For example, indicator K.1 refers to have knowledge on how to communicate to transfer knowledge and develop abilities to establish an efficient two-way communication strategy. Bonding and bridging capacities within networks are also relevant to bridge the gap between communities and FRM institutions.

- *The municipality: a key actor in the communities' capacity development*

The municipality engagement in a participatory process of risk management has been critical to foster communities' participation despite their low levels of capacities. The German case is a good example. While the levels of capacity are non-existent or low regarding K.2 learning capacity, M.1 motivation to mitigate risk, M.2 motivation to work collectively, N.1 and N.2 no involvement in flood risk networks, the BW municipality was able to make a difference and involve the communities in the decision making process.

- *Missing main capacities in FRM institutions (all cases)*

Two main capacities are missing in the FRM structures, these capacities are affecting communities' development. The first one regards funds (F.2 and F.3), especially in ex-ante stage, to help communities to self-organise and undertake initiatives to mitigate flood risk. Capacity development is not easy to achieve without financial support to motivated groups, this capacity is lacking in all the cases. The second one is the capacity to involve communities in the decision making processes driven by the FRM institutions (P.1 and P.2). In many cases it is the municipality that represents citizens; however, to involve citizens and communities is important to integrate experienced-based knowledge, to form joint networks, to foster trust and a dialectic environment.

- *Resilience related capacities*

Capacity development in both communities and FRM institutions is in many cases related to the regular confrontation to flood event, as a result dimensions such as knowledge, motivation, networks and finance are reinforced. However, a set of resilience related indicators, especially M.3 (motivation dynamics) related to the capacity to use traumatic events to change attitude and behaviour for the future is not always straight forward. In fact, in most cases flood events have not been fully used as learning experiences to strengthen existing capacities and develop new ones, especially in preparation of a flood event. In the cases in which some groups have taken self-organisation initiatives, see French case in Fresnes, especially in ex-ante and preparedness stages strong leadership of engaged individuals and already existing social ties in the neighbourhood were relevant to develop this capacity. Regular confrontation to flood events does not automatically lead to the development of this capacity related to resilience.

- *Identified potential for capacity development in individual cases*

The Spanish and Italian cases have motivated communities to mitigate risk due to the frequency of the flood events. This can be used to develop further networks, especially

in the Italian case where motivation to work collectively is already high. The Spanish case is dealing with social conflict and different visions of flood risk management in the area which might be seen as a potential to start a dialectic environment. Social conflict might be preventing M.2 (capacity to work collectively) and N.1, N.2 (networks performance and autonomy) to take place.

The FRM structure in these both cases is not involving the communities in the decision making processes to mitigate flood risk, neither providing funds to support communities' self-organisation and long lasting initiatives. In fact, P.1 and P.2 is low in both cases. Without engagement of the FRM institutions or any other organisation it seems difficult to trigger capacity development processes.

The German case has initiated a participatory process which is a good opportunity to help communities develop capacities in dimensions such as knowledge, motivation and networks. The fact that the FRM institutions have started to engage with participatory processes, even if in a limited way, is already a positive step towards developing capacities in the case. However, the FRM institutions itself require some capacity strengthening, in fact most of the indicators have a medium level and only funds are evaluated as high.

The French case presents the most important gap between capacity development in the FRM institutions, higher, and that of the communities, mainly low and non-existent. The most important challenge in this case is to start building a bridge between these two groups to transfer capacities from FRM institutions to the communities and citizens, namely knowledge, motivation, networks and funds. The low level of participation (indicators P.1 and P.2) is zero and low which means that the FRM structure is not yet engaged to involve communities in flood mitigation and decision making processes, this is an important limitation and it is preventing a capacity development process in the communities side to kick off.

The Netherlands case is the more balanced between the level of capacities between FRM institutions and the communities'. This case has the highest levels of participation in both FRM institutions and communities, this is already an important potential to develop other capacities in both groups. Knowledge on the new challenges of flood risk can be enhanced in the communities as well as motivation to mitigate flood risk related to this new knowledge. Networks can also be enhanced now that communities have started to work collectively. Funds for community self-organisation and initiatives can be developed too. The challenge in this case is to maintain a process that started with a landscape project but that will require further fuelling to keep a dialectic relationship between authorities and the different communities.

All in all this comparative assessment will be useful for the next steps of the CAPFLO project. It will help to better focus the participatory tool for each of the case in order to strengthen the weakest capacities in each case.

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