

Identifying stakeholders and their expectations



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Focus sections

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Introduction

Completing a river-basin assessment or regional plan is an important step that should be taken in advance of a restoration project for aquatic environments or an integrated management project. An assessment consists of "analysing and understanding the structures and physical, economic and social processes influencing the organisation of an area and its management, while also identifying the issues and potential improvement projects for the area. The aim of an assessment is to understand before taking action. To that end, it should provide an analysis and an evaluation." (RESOTER, 2014). Today, natural factors (hydrology, ecology, etc.) are systematically taken into account in projects, but social, economic and cultural aspects are rarely integrated to a satisfactory degree (Germaine and Barraud, 2013a). Attention should however be paid to those aspects. The quote by A. Berque (1995, p. 17), that "societies interpret their environment on the basis of how they develop it and, conversely, they develop it on the basis of how they interpret it", is an invitation to managers to investigate the perceptions of the various stakeholders.

An integrated management project means putting together a territorial project that takes into account the stakeholders and their expectations (see the Feedback section on *The Bourbre River*, page 112). Studies on perceptions contribute to fulfilling that requirement. In the environmental field, social expectations are rarely incorporated into project planning. Identifying the perceptions concerning aquatic environments contributes to better defining the underlying issues of the project, the expressed or unexpressed expectations, and consequently to better understanding the stakeholder interactions that will drive the debates and influence the project (see the Feedback section on *The Sèvre Nantaise River*, page 116). Greater knowledge on these aspects is a means to anticipate tensions (in view of managing them), but also to establish more integrated objectives covering more (or all) of the issues involved in the management of an aquatic environment, for example, integration of the landscape dimension. Finally, an in-depth understanding of the perceptions makes it possible to comprehend current practices with respect to the environment and to better anticipate the conditions required for the success of the project.



Who should be surveyed and why?

Preparation of an integrated management plan implies learning about the many different points of view of the different stakeholders (see the Focus section below on values and "*postures*"). Aquatic environments are attributed a wide array of values and viewed from a number of angles (see the Feedback section on *Canada*, page 120). Attentiveness to the multiplicity of views leads to increased awareness of the complexity of individual expectations and of the collective issues and dynamics with respect to aquatic environments. But when studying the perceptions of aquatic environments, via surveys and participatory techniques, one is in contact with individuals. Is it possible to generalise on the basis of the data collected? How can we shift from individual perceptions to those of groups of stakeholders? There are a number of approaches to producing information on groups. Selection of one or the other depends on the information available for the local area and on stakeholder interaction.

Values and "*postures*", the many perceptions of aquatic environments

The concepts of "value" and "*posture*" proposed by Y. Droz and V. Miéville-Ott (2005) in their work on the perceptions of landscape constitute an interesting approach to understanding the diversity of perceptions, and their implications on how stakeholders can position themselves during a management project.

Postures are one of the factors explaining stakeholder opinions during a project. The concept of *posture* is grounded in the identity of the stakeholder who, according to Y. Droz *et al.* (2005, p. 22) "is not conditioned by a clear link to a given social group, but depends on the personal history of each person and on their multiple social ties (gender, professional and recreational activities, family history, etc.)". A stakeholder may also have a number of *postures* such that his words and action, which are a form of expression of his *postures*, may occasionally appear not very rational to the observer (Lahire, 1998). For example, it is not uncommon that in a local water commission (CLE), a representative of irrigating farmers defends, for economic reasons, agricultural activities that degrade water quality, but at the same time requests an improvement in water quality in his role as a consumer of drinking water or as a person partaking in aquatic recreational activities (Girard, 2012). Y. Droz *et al.* insist however that, concerning landscape, there is always one dominant *posture*. When defined in those terms, *posture* evokes what other authors call values or occasionally the value system.

Postures may be seen as frameworks within which an individual forges perceptions from which the person then projects values on aquatic environments. A *posture* is the result of multiple values that are coincidental and ranked.

Y. Droz *et al.*, (2005) proposed a classification of these values for mountain landscapes (productive value, aesthetic value, biological value, etc.). The ranking of the values revealed a number of different *postures*, that of people in the tourism industry, that of forestry workers, that of local people, etc. Identification of *postures* and of the constituent values is applicable to many fields other than landscape geography. Studies on the values of a region (Girard, 2012), of peat bogs (Sacca, 2009) and of biodiversity (Maris, 2010), to name just a few examples, have identified the *postures* of stakeholders in operational settings. These *postures* are in turn a means to understand the opinions of stakeholders with respect to an issue or management project, and consequently to approach participation processes with a maximum of insight.

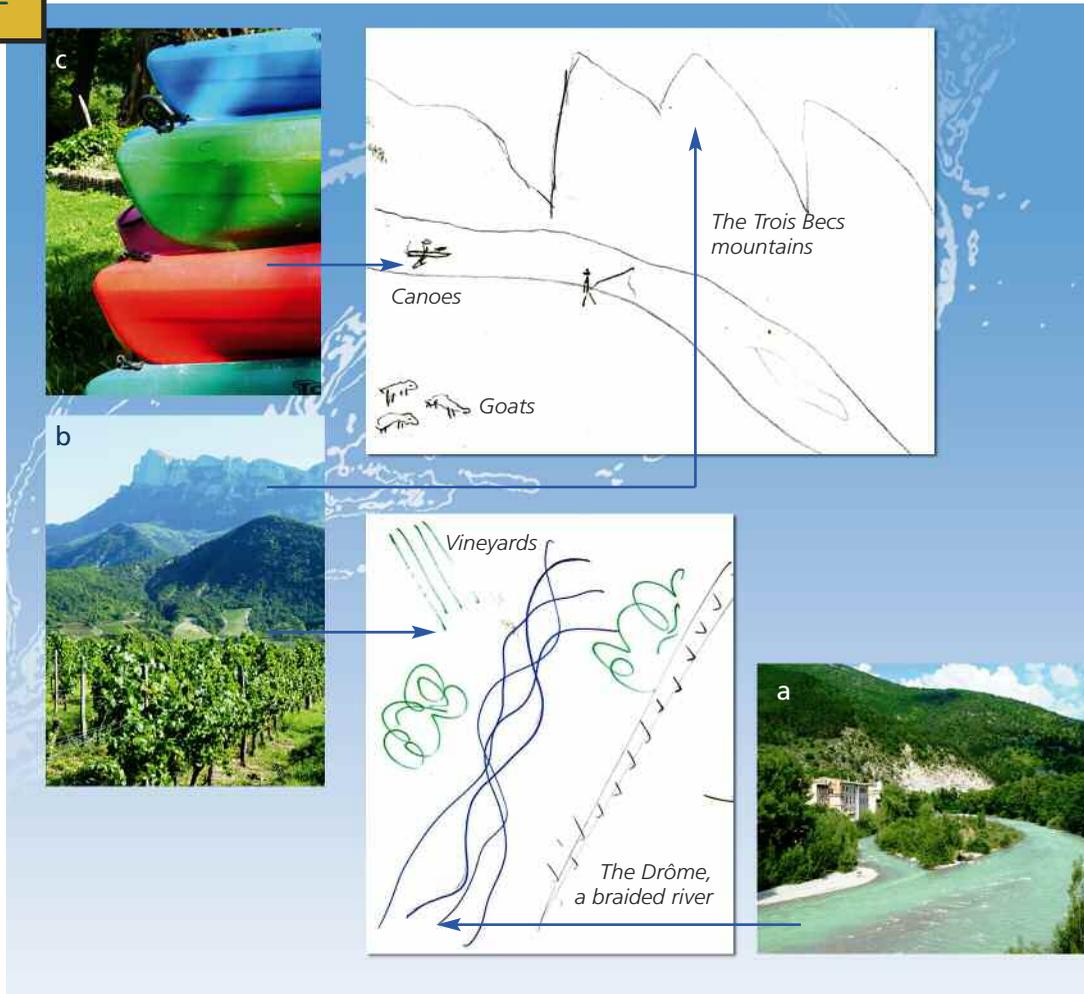
Individual perceptions often influenced by collective groupings

Each person defines and develops their personality in terms of their belonging (or desire to belong) to different groups, whether institutional or not. An individual identity depends on many factors, including regional, cultural, professional, family, etc. (Frémont, 1976; Guérin, 1989). The ties that each person forges with the various groups are based on the existence of shared values and standards, i.e. shared expectations, references and behaviours. That is why, in many cases, individual perceptions align, at least partially, with collective perceptions.

This was demonstrated by the use of mind maps in the Drôme valley (see the Focus section on mind maps, page 42). They were used as a means to collect mental images during an interview-based survey of people participating in the local water commission (CLE) for the Drôme SBMP (sub-basin management plan) to identify the spatial perceptions underlying local practices (Girard and Rivière-Honegger, 2012; Girard, 2012). The participants were asked about their perception of the "Drôme valley". What do those words evoke? How do they position the valley and set its limits? How do they see it in terms of the landscape, the economy, politics? They were asked to draw the "Drôme valley" on a blank sheet of paper and to comment their drawing. The results of the survey showed that, at least for the CLE participants, the subjective, individual perceptions also revealed a shared, collective perception. From the individual perceptions it was possible to conclude that water-related territorial boundaries existed for that group of stakeholders working on the Drôme River (Girard, 2012). This shared notion of a territory is probably a product of the intense collective efforts carried out within the CLE over a number of years.

Above and beyond the apparent differences in life experience and in drawing capabilities, analysis of the mind maps revealed a surprising degree of homogeneity in the perceptions of the Drôme valley among the group of water stakeholders. There were clear similarities in the definition and the limits placed on the Drôme valley, as well as in the identification of its landscape and landmarks. The "Drôme valley" is seen as a specific entity characterised by a number of markers, namely the river and certain mountain ranges, and by symbols such as vineyards, lavender and the donjon in the town of Crest (see Figure 12). Depending on the time they had lived there, the people questioned expressed their links to the valley as "a feeling of belonging", "attachment", "adoption" or "integration".

Figure 12



Drawings and photos © S. Girard, 2012

The "Drôme valley" is seen as a specific entity characterised by a number of markers, namely (a) the river and certain mountain ranges (the Trois Becs), by symbols such as (b) vineyards, goats and by activities such as (c) canoeing and fishing.

Analysis of the mind maps and the accompanying comments also showed that the process of becoming a territory is recent and is based to a large extent on the river and its management. Hydrographics play a central role in the symbolic organisation of space. The river and its tributaries form the key vectors and landmarks, similar to the streets and intersections in the mind map of a city. The river serves to focus and symbolise in a single object the values distinguishing the territory, for example its diverse (colour, discharge), wild (not contained) yet inhabited (many human uses of water) characteristics. It acts as an "expression both visual and symbolic of the territories" (Di Méo *et al.*, 2004). And historically speaking, it was on the topic of water that the towns upstream and downstream in the valley started working together in the framework of the river contracts and the SBMP. The river enabled people to overcome the existing differences by uniting and serving as a federating symbol. The work put into water management triggered the launch of a territorial project spanning the valley, initially addressing the river, but increasingly other objects and issues such as biodiversity and energy.

This example shows that, in certain cases, the historical context of an area can lead to the emergence of groups of people sharing collective perceptions. This type of management situation justifies the shift from individuals to groups of people when analysing the perceptions concerning aquatic environments. However, working on groups of people defined *ex anti* requires certain precautions. In which type of context is this approach useful? And what are the alternative methods to produce data on collective perceptions?

Categories, the first step or the end of analysis?

In the management of aquatic environments, analysis of perceptions generally addresses different groups of stakeholders involved in a project (managers of natural areas, local elected officials, farmers, recreational users, industrial representatives, etc.). This categorisation is based on the assumption that each group of stakeholders has a number of shared interests that contribute to generating a specific set of perceptions of aquatic environments. Each person is assumed to have perceptions consistent with those of the group(s) to which that person belongs. In this sense, the individual perceptions constitute, for the purposes of the analysis, the collective perceptions of the various categories of stakeholders.

Survey methods are often based on such *ex anti* categorisation of stakeholders. This situation was illustrated by research in the Vilaine basin looking at how floods are perceived by the residents (Dupont, 2012; Valy, 2011) (see Figure 13 and the case study page 37). A questionnaire was given to different groups of residents assumed to have specific perceptions of flood risks. The categories were established prior to the survey on the basis of an in-depth analysis of the studied area. The initial criterion consisted of defining areas in terms of their exposure to flood risks, i.e. areas confronted with similar levels of potential vulnerability. Those areas were then redefined according to their distance from the river and the type of residential area (these two criteria were assumed to influence the perceptions of residents concerning flood risks). As a result, eight categories of residents were established prior to running the survey.

Figure 13



© Vilaine and Côtiers flood-prevention department, 1974

Flood of the Vilaine River at Pont-Réan, in the town of Bruz, in 1974.

Analysis of the perceptions of groups of stakeholders defined *ex anti* obviously requires excellent knowledge on the various parties involved in the project. If insufficient knowledge on the interaction between stakeholders is available, this type of approach may produce erroneous results. For example, excessive importance may be placed on certain perceptions while neglecting others. Consequently, this approach should be used only when in-depth analysis on the interaction between stakeholders has already been or can still be undertaken. If the analysis has not been carried out, there are other, equally rigorous methods available to shift from the individual to collective perceptions.

In the latter case, categorisation no longer constitutes the beginning of the analysis, but rather the result. How should one proceed? The surveys are not carried out on specific groups of stakeholders, but on a set of individuals representing the overall population of the studied area (see the Focus section below on samples). The data on perceptions collected during the survey are analysed and ranked in terms of qualitative and quantitative criteria (Berthier, 2010). The categories are the result of the analysis where the objective is to constitute groups of people having similar perceptions, without first taking into account their profile (age, sex, type of stakeholder, etc.). Subsequent analysis of the groups can then characterise them as a function of the variables assumed to influence the perceptions of aquatic environments (age, sex, type of stakeholder, etc.)



Understanding the whole using samples (according to Berthier, 2010)

Selection of a sample for a survey consists of selecting a representative part of the studied population (the parent population). It is first necessary to define a number of variables used to characterise the parent population and subsequently to obtain the data on those variables. Then, depending on the overall objective of the study, the researcher can select people such that the sample reproduces the characteristics of the parent population (if the objective is quantitative) or people whose characteristics cover all the different cases found in the studied population (for a qualitative objective).

This type of approach was adopted for the *Renouissance* project that studied the perceptions of residents along the Rhône River (in the town of Vernaison, downstream of Lyon) concerning Japanese knotweed, an invasive plant that grows along rivers (Valy, 2013). A sample of almost 150 people thought to be representative of the population of Vernaison was put together. In this case, representativeness was defined on the basis of age and sex criteria obtained from INSEE (National statistics institute). Each person then received a photo-questionnaire (see the Focus section on photo-questionnaires, page 102). Their answers were analysed statistically in order to constitute different classes of people having developed identical perceptions. Among the factors explaining the differences in perceptions among the people surveyed, knowledge of the plant and ability to identify it had significant influence. People capable of identifying and naming the plant on the basis of a photograph found the landscapes shown to be less aesthetically pleasing than people who did not have the necessary knowledge. This approach, based on a sample group of people, was thus capable of distinguishing two groups of stakeholders having different perceptions, namely those possessing knowledge of invasive species and those without. This categorisation is of particular importance when attempting to set up an integrated management plan for controlling invasive species along rivers.



Techniques used to study the perceptions of aquatic environments

Surveys can be used to obtain data on social perceptions concerning water and aquatic environments. There are three main types of methods and each has specific features enabling different approaches to the issues raised by the management project:

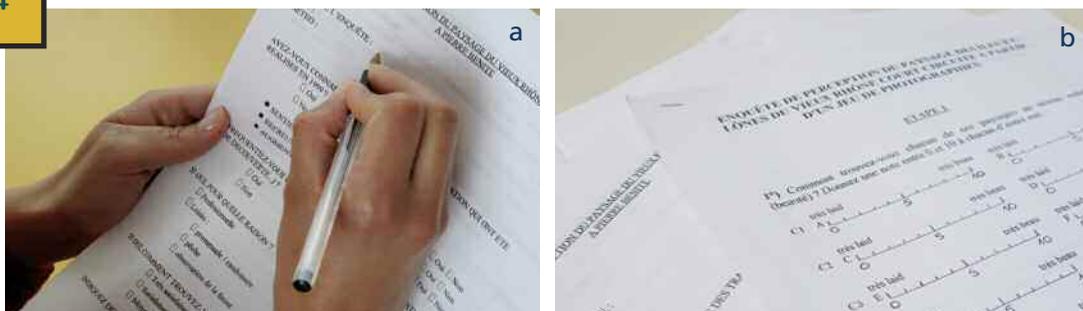
- questionnaires;
- interviews;
- observation.

The three methods may be used separately or they may be used to complement each other. The point here is not to compare them, but to describe each and facilitate selection on the basis of the questions that the managers wish to answer as well as the constraints weighing on the project. Whatever the method selected, the objective is to test the previously developed hypotheses that will result in the survey strategy.

Questionnaires

A questionnaire-based survey is a standardised method with inherent advantages and disadvantages (see Figure 14). Its purpose is to standardise and facilitate the collection of information on opinions. The influence that surveyors can have on the answers provided by the surveyed persons is generally seen as limited (Berthier, 2010). However, it is certain that the wording of the questions can significantly impact the answers. The initial, preparatory work is therefore a key step in the survey. The decision on whether to use open (respondents may answer freely) or closed (respondents choose among a limited number of predefined answers) questions, their wording and the order in which they are presented are all factors that must be thought out and tested prior to the actual survey. The survey may also combine the two types with variable proportions of open and closed questions, given that the former constitute a richer source of information, but are more difficult to process statistically. Care should also be taken to ensure that the questionnaire is fairly short to facilitate the procedure and ensure reliable data. The study carried out on the perception of flood risks in the Vilaine basin is an interesting example of a questionnaire-based survey (see the case study opposite).

Figure 14



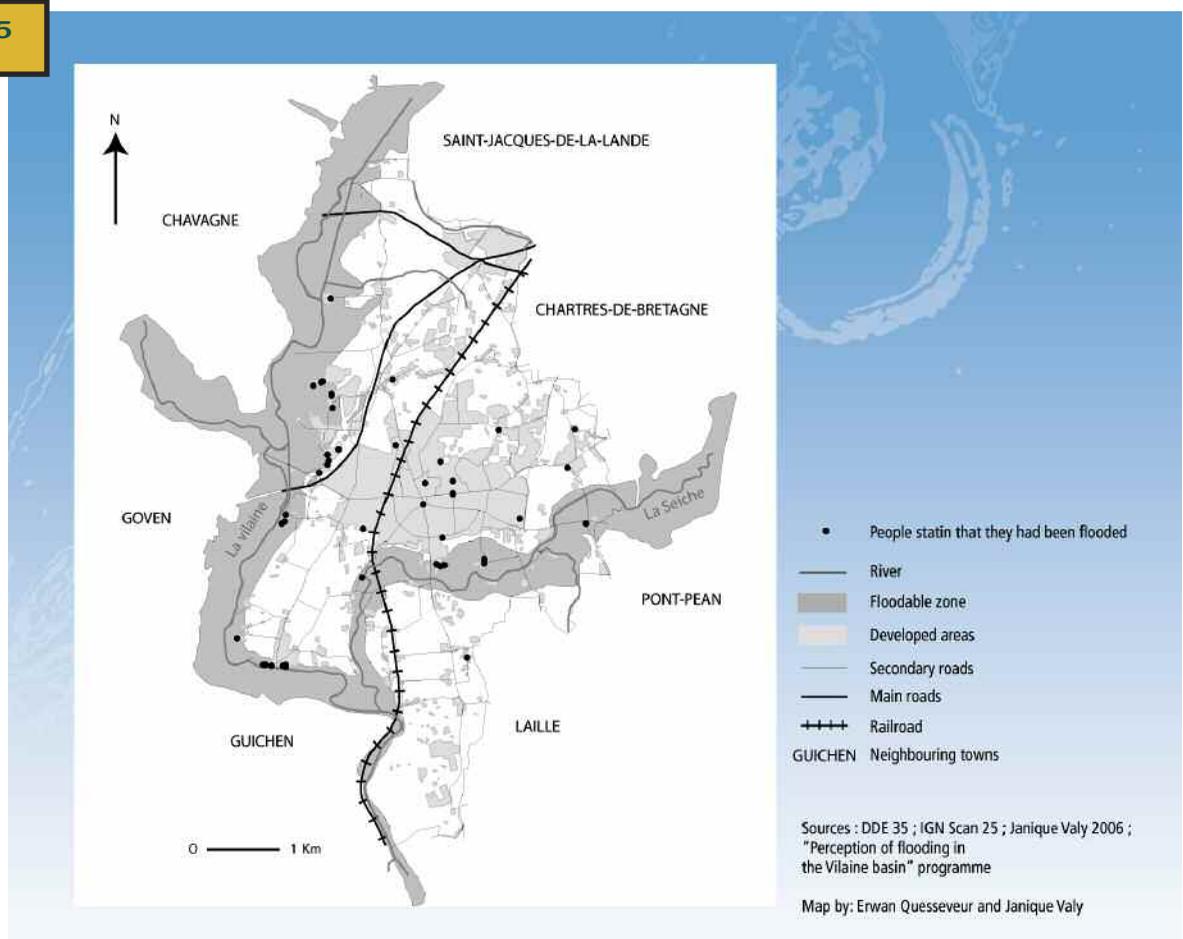
Surveys may consist of both types of questions, with a majority of closed questions and a few open questions.

a, b © B. Morandi, 2013

Perceptions of floods in the Vilaine River basin, a questionnaire-based survey

The research programme titled "Multi-disciplinary approach to perceptions of floods in the Vilaine basin" (2005-2007) is an example demonstrating the value of questionnaires in gaining knowledge on the perceptions of stakeholders (Dupont *et al.*, 2008). The objective of the programme was to characterise the perceptions of floods of residents, institutional stakeholders and economic stakeholders using a mixed set of approaches to determine how the flood itself, the memory and the experience were described, as well as perceptions concerning nature and water, etc. The study consisted of comparing two different towns, Bruz (see Figure 15) and Montfort-sur-Meu, over a period spanning the last three centuries. It was sponsored by the local EPTB (public river-basin territorial agency) and the Vilaine development agency (IAV), that co-funded the research (2003-2009) with the French State in the framework of the action plan to prevent flooding in the Vilaine basin. A minimum of 30 questionnaires were used in each of the predefined geographic sectors in the two towns. The ratio of surveyed persons in the two towns was roughly equivalent to the ratio of the number of residents (281 surveyed persons in Bruz and 142 in Montfort-sur-Meu). The perceptions of the stakeholders (the institutional and economic stakeholders) were analysed, however particular attention was paid to the residents, "who would appear to be the 'great unknown' in the basin" (Dupont, 2012, p. 26). The residents were informed via the town bulletin about the survey, the context in which it was being conducted and that a researcher would soon contact them. The researcher delivered a copy of the questionnaire and set up appointments with the residents. The purpose of the meetings was to carry out part of the questionnaire face-to-face and then collect the written responses.

Figure 15



Map showing the locations of residents of Bruz (Ille-et-Vilaine department) who stated during the survey that they were flooded during the events at the end of the 1900s.

The results show that a sizeable proportion of the residents are aware of flood risks, but that they are not seen by managers as stakeholders with worthwhile project recommendations. The local residents possess valuable information on the risks, based on their experience and knowledge transmitted (Dupont, 2012, p. 227). In light of these results, participation on the local and regional levels must be developed in compliance with the European flood directive (2007/60/EC). For IAV, which had already expressed the desire to "better understand the impressions of the different concerned persons", these results will "clarify the current situation and assist in future decision making on flood management in the Vilaine basin" (Dupont, 2012, p. 8). A further result was improved preparation and diversification of communication strategies (see the Feedback section on the *Development agency for the Vilaine River basin*, page 126).

It is also possible to use images (photographs, maps, etc.) in the questionnaire. A photo-questionnaire happens to be one specific type of questionnaire (see the Focus section on photo-questionnaires, page 102). It is a useful method to study the perception of the overall landscape of an aquatic environment or to address the perception of a particular element in the landscape (dead wood, invasive plants, riparian vegetation, etc.). The photo-questionnaire technique is also of interest because research tends to show that people do not perceive actual landscapes (viewed *in situ*) differently than photographed landscapes (Le Lay *et al.*, 2005). The use of images is also a means to limit the variability of responses and to facilitate processing of results because the participants respond to identical visual input rather than to open questions that may refer to non-standardised places, landscapes and objects (Goeldner-Gianella and Humain-Lamoure, 2010).

One of the main advantages of questionnaire-based surveys (both photographic and other) is that they facilitate comparisons over both space (different sites) and time (different dates, e.g., before and after a project). They are also a means to better identify perceptions concerning large areas. For example, they are a suitable method for the study of large populations. The collected data are easy to quantify and can be analysed statistically. However, caution is advised in generalising any results obtained because it is not always possible to ensure that the selected sample is representative.

The cost of this method in terms of the time spent on each person questioned is fairly low, however a large number of persons must be surveyed in order to produce statistically rigorous and reliable results. It is also necessary to vary the times and days when the surveys are carried out to avoid over- or under-representation of a particular profile, e.g., retired or unemployed persons. As a result, the total time spent on a questionnaire-based survey is significant and the corresponding human and financial costs are not negligible.

Interviews

Interview-based surveys can be used to "explore different facts for which words are the main vector", where the facts in question concern both representative systems and social practices (Blanchet and Gotman, 1992, p. 25). Analysis of the meaning that stakeholders vest in their practices can reveal the value systems and normative reference points underlying their behaviour (Blanchet and Gotman, 1992). It should be noted that there are different types of interviews (see the Focus section below on interviews).



Sounding opinions via interviews

Selection of the type of interview depends on the topic of study and on the operational conditions. A distinction is generally made between structured, semi-structured and unstructured interviews. All are carried out face to face and the interview may be recorded. A recording serves as a memory for the interviewer who is therefore freer to participate in the discussion. The transcription of the interview can be used for systematic analysis, i.e. an analysis of its thematic content, the syntax and the vocabulary employed, etc. Voice-recognition software is available to automate the transcription, such as Sonal or Dragon (© Nuance communication).

Unstructured interviews are used to acquire an in-depth understanding of complex phenomena or to study situations undergoing change. The interviewee organises his thoughts on a topic that is proposed in an informal manner without a pre-established framework. "Via the progression of the discussion and the association of ideas, the interviewee expresses his perception of a situation, an event, his interpretation and experiences, and reveals his thoughts and attitudes" (Berthier, 2010, p. 72). The semi-structured or guided interview is the most commonly used. It is based on an interview guide that, similar to an unstructured interview, proposes a starting point, but is then followed by a list of important topics that the interviewer wants to cover. This type of interview may be carried out in groups of six to ten people. In this case, the data collected pertains to a set of collective, not individual opinions. Structured interviews are used for studies attempting to verify information. Doing interviews requires time and know-how concerning their design, execution, transcription and analysis.

The difficulty for the interviewer is to have the interviewee put into words something that has not yet been expressed. Rather than influencing the person to say what other people think (e.g. "everyone here does it that way", "yes, we all think the river is dirty", etc.), the goal is to focus the interview on the subjective ideas of the person surveyed in order to understand the driving forces behind his/her perceptions and practices.

A further difficulty in interview-based surveys lies in interpreting what the interviewees say concerning the reasons why they do what they do. The content produced by stakeholders can be analysed in two stages, first by examining the exact words, then later by stepping back and considering the context in which the person's ideas are expressed (Olivier de Sardan, 1995). Given that a stakeholder may project several *postures* (Droz and Miéville-Ott, 2005), it is necessary to allow for some inconsistency in the opinions expressed and their justifications (see the Focus section on values and *postures*, page 31). Another risk lies in attempting to inject meaning where there may be none (Lajarge, 2008).

Similar to questionnaires, images may be used during interviews to complement the discussion. The interviewer can supply the image as a topic, in the form of a photograph, a post card, a map, etc. (see the Focus section on photography in survey methods on the next page). Techniques such as 3D geovisualisation, used to date in public-involvement efforts (see the Feedback section on *The Rhône River*, page 130), may also serve as a topic for interviews. The image may also be presented (or produced) by the interviewee (see the Focus section on mind maps, page 42). In which case, it serves as a means to enhance the knowledge on or the understanding of the perceptions that individual people have concerning aquatic environments.

Compared to questionnaires, interviews provide more precise information on the perceptions of stakeholders by offering them a chance to express themselves. This type of survey is therefore better suited to smaller target populations, primarily because it requires more time per person. Interview-based surveys can also be used to complement questionnaires for a number of key stakeholders in the area.



Photographic expression in survey methods

Photography has three advantages that justify its use as a survey method, namely 1) it represents real life ("it exists, I saw it and the photo proves it"), 2) it is a popular, easy-to-use technique and 3) it provides a non-verbal language which can facilitate the expression of ideas that are difficult to put into words. It may be said that photography serves as a "can opener" for ideas.

There are two survey methods using photography.

- **A photo-questionnaire, i.e. the photo(s) already exist (see the Focus section on photo-questionnaires, page 102).**

Photographs may be used, for example, to study how people react to restoration projects. In this case, the interviewer selects a series of photos and asks the interviewees to mark them, to comment them, to sort them or simply to select a few from the series.

This technique implies that the photographs have already been taken. It may be necessary to call on a professional photographer to produce the photos. The advantage of this technique lies in that it is quick and flexible. The interviewees can perform the requested task rapidly, they are not obliged to travel to the site and a computerised questionnaire may be used for the survey. The gain in time means that a larger number of people can be surveyed, thus making possible quantitative analysis.

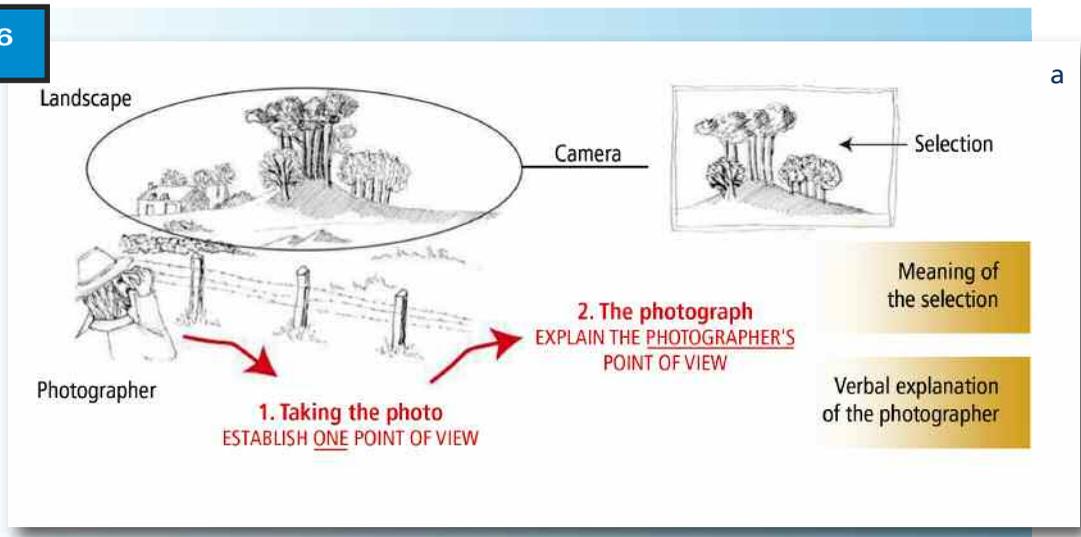
- **The interviewee takes the photos (*native image making*)**

Photography can also be used in the sense that the interviewee travels to the site and takes the photos (Blouin-Gourbilière, 2013) (see Figure 16). In France, the agronomist Yves Michelin (Michelin, 1998) developed this method in the 1990s. Some preparation is required because certain selected (and willing) people receive a questionnaire with precise instructions (e.g. "photograph the landscape that you prefer", "photograph the site of a river project that, in your opinion, was a success"). It is also possible to provide them with a disposable camera. After a few days during which they think about and carry out the task, the participants then send in their photographs with a short explanation. It should be noted that it is also possible to use the same technique for a group. In this case, the participants are not selected. They volunteer for a workshop, a photo contest, a trip to the site, etc.

The resulting photographs may be used in three ways. First of all, in conjunction with competent experts from the social sciences, it is possible to analyse the perceptions expressed by the photos and the comments. The results are often highly informative (location of favoured sites, expression of affinities, tastes and distastes, statements, etc.). Secondly, the photographs may be used as a topic for discussion during a meeting. It is often easier to express an opinion in reaction to a photo. Finally, the photos may serve as a "showcase of shared knowledge" and be used for an exhibition, a promotional document, a slide show, etc. In this case, one speaks of promoting "non-expert knowledge", as compared to "expert knowledge". It is highly gratifying for a local resident to know that managers place importance on the opinions expressed.

Figure

16



© C. Blouin-Gourbilière, 2013

Two steps in formulating a discourse on landscape using photography. First establish a point of view, then explain it.

Mind maps, drawings as a form of mediation

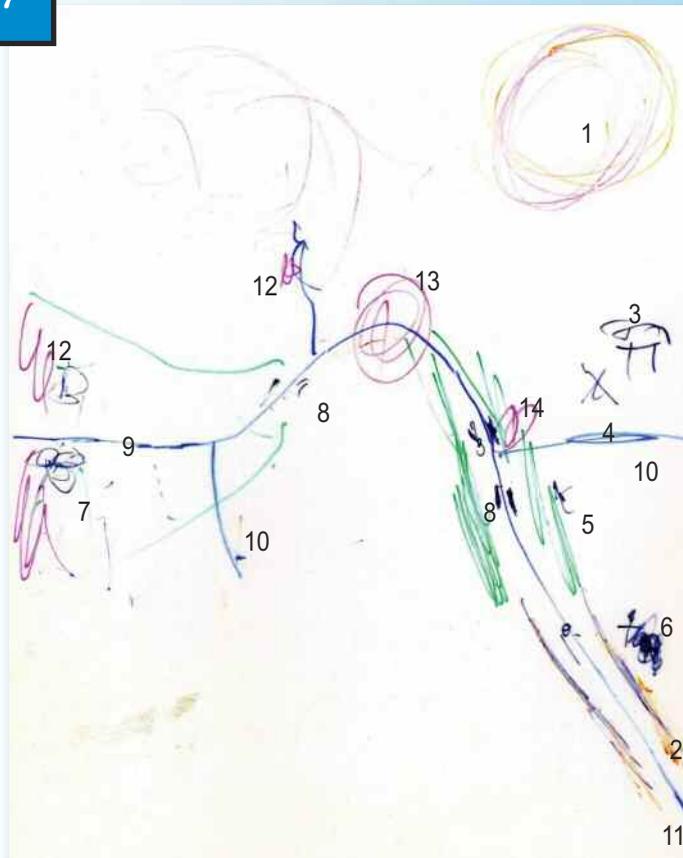
Mind maps (see Figure 17) can be used for a number of different purposes:

- understand how people position and orient themselves in space;
- identify the preferences people have for certain spots;
- understand the boundaries seen by people and the meaning assigned to space.

Mind maps were developed in the 1980s. They were first used to reveal the subjective and individual perceptions of space. Since then, environmental geographers have used them to understand the social perceptions of groups of people (Mc Kenna *et al.*, 2008; Gueben-Venière, 2011). In this sense, mind maps make visible territorial relations, e.g. those between stakeholders and the area, and provide information on the landscape itself, i.e. a space adopted and organised by those stakeholders. One way to interpret the drawings was inspired by the two-step analytical framework devised by K. Lynch (1969):

- identification and physical structuring of the area. The goal is to understand the spatial organisation using a basic set of figures (point, line, surface area), to determine the spatial relations between the figures (intersections, overlaps, etc.) and finally to establish the relations between the figures and the observer (frequency of contact, residency);
- meaning of the socio-cultural area. The goal is to understand the practical meaning and the sentimental value attributed to the spatial image, in particular by integrating memories and subjective experience.

Figure 17



© S. Girard 2012

- 1. sun and clouds
- 2. mountains
- 3. sheep
- 4. people working
- 5. camp ground
- 6. ski resort
- 7. (fruit) trees and factories
- 8. people bathing
- 9. Drôme River
- 10. small streams
- 11. source of the Drôme River
- 12. cities and large villages
- 13. city of Die
- 14. town of Luc-en-Diois

Example of a mind map of the Drôme valley with notes by the interviewer on the basis of the comments made by the interviewee.

A number of criticisms have been raised concerning the use and interpretation of mind maps, meaning that they must be used with caution. The mental processes involved in the perception and understanding of space remain largely unknown and geographers can simply access the external manifestations (the results) of those processes (André, 1998). In addition, mind maps are very sparse expressions of the mind. Their analysis is both more complicated and less productive than that of expressed words because though they can be used to assess distance and orientation, they cannot address other aspects of how space is perceived, contrary to words (Bonin, 2001). In addition, a major criticism concerns the temptation to establish a direct link between the mental processes and the represented object, given that a number of intermediate operations must take place, notably materialisation of the concepts, to say nothing of the aptitude and the visual and manual skills required for the drawing. Two main risks exist:

- the surveyor, through the words chosen and the proposed form of expression, can influence the depiction of the spatial object;
- the depiction is in all cases just one potential and contextualised interpretation of the object.

Consequently, mind maps must be used in parallel with other tools, such as interviews, to even out the differences in drawing capabilities and to question each person on the meaning of their drawings. It should be noted that a request to draw may be perceived with apprehension and motivate a complete refusal to participate in the survey. It is therefore preferable, when different techniques are used together, to propose the mind map as the last step.

It is also preferable to have a single surveyor or team of two surveyors to ensure that the interviews and the sequence of questions are as similar as possible from one survey to the next. A prerequisite for this method is the capability of the surveyor to inspire enough confidence on the part of the interviewee that the latter feels free to express his opinion. But the surveyor must also tread softly to avoid influencing the answers (avoid creating the feeling that the surveyor expects a particular answer). Interview-based surveys require a significant investment of human resources, which has a cost. To that, it is necessary to add, when interviews are recorded, the transcription and processing (qualitative or quantitative) times which far exceed the time required for the interview itself.

● Observation

Observation is a survey technique that consists of observing the behaviour of one or more persons at a given time and place (Arborio and Fournier, 1999). This technique puts the surveyor in a position to live the reality of the observed persons and to gain information that cannot be obtained using other methods (Soule, 2008). Observation requires a three-fold effort on the part of the surveyor, i.e. perception, memorisation and notation, that together make it possible to achieve the previously set objectives. Observation may be participant or non-participant, and it may depend solely on the eyes of the surveyor or also on photographic/video systems (see the Focus section on observation, next page).

Participant or non-participant observation?

There are two types of observation, participant and non-participant.

Non-participant observation implies that the surveyor remain outside the study zone and the on-going situation in order not to influence or alter the behaviour of the observed persons. This type of observation is used when the situation does not allow for the presence of an external person (for practical reasons or in order not to alter the information). For example, a video camera may be used for the survey to film an area (with the necessary authorisations).

Participant observation requires that the surveyor enter the same environment as the surveyed persons and list the observed behaviour, practices and customs using a predefined document. Similar to non-participant observation, the surveyor may also use a camera and/or video system to cover every detail (see Figure 18). Images, whether still or animated, directly capture the reality of the moment (Terrenoire, 1985). A camera can retain a movement and illustrate the observations of the surveyor, whereas video can be used to describe movements and analyse complex behaviour on the basis of action sequences.

Figure 18



© S. Ah-leung, 2013

Example of a video camera positioned in situ for a participant observation on the behaviour of people in urban wetlands..

During surveys in the field, the behaviour of people may be modified by the combined presence of the surveyor and of a camera or video system. The people may react in different ways. Some people ask questions and, depending on the answer provided by the surveyor, modify their behaviour. Others leave the observed area or explicitly request that the surveyor leave the area. All of these reactions, said to be "profilmic" (De France, 1989), may potentially be troublesome for the surveyor, but are often limited to the initial contact with the camera or video system. Generally speaking, these reactions dissipate over time and the surveyor/device become virtually invisible once the people have become accustomed to their presence.

Practically speaking, the observations may take place at night or day, over one or more seasons. Depending on the aim of the survey, the surveyor can adjust the observation in terms of its duration (between one and six hours), but also according to the days of the week.

For example, if the studied population consists of children, the observations will take place on a weekend. To facilitate data collection, observations are often carried out using a predefined document indicating the elements that should be noted. The document is filled out *in situ* and the contents are then recapitulated in a summary sheet (one per observation) that is used for data processing. The post-observation part of the work generally consists of grouping and organising the collected data in databases (location, site, number of observation hours, number of persons encountered, etc.) and in image banks (sorting of photos according to the observation site, elimination of "bad" photos, etc.). Once the processing has been completed, the analysis can begin. It consists of using the processed data to provide answers to the questions raised by the study. For example, if the objective is to analyse the behaviour of the public in urban wetlands, the photos may be used to list and characterise the various attitudes and actions of the public. Finally, in terms of the work involved, it is necessary to plan on two hours of analysis for each hour of observation (this may vary depending on the level of detail required by the study).

This data-acquisition technique is particularly well-suited to analysis of habits and practices, as is shown by the study carried out near urban stormwater-management systems (see the case study on the next page). The study of these habits and practices is a means to simultaneously grasp types of perception of environments. It is necessary, however, to adopt an objective position and approach in order to obtain useful results. Similarly and in view of verifying and consolidating the data obtained, it is advised to combine observation with other sociological investigations.

Observation also raises a number of ethical questions, in that the observed persons are not always aware that they are being observed, and legal implications when techniques such as photography and video are used. This is because the image rights are part of the personality rights of each human being. In France, they are protected under article nine of the French Civil code and by article eight of the Declaration of human rights. In other words, each person may decide to authorise or oppose the taking and broadcasting of their image. Image rights are a component of a person's personality and authorisation is therefore required. In a public area (understood as a place freely accessible to all without requiring any particular authorisation, where access is permanent or limited under certain conditions), photography and filming do not require that the authorisation of each person present be obtained.

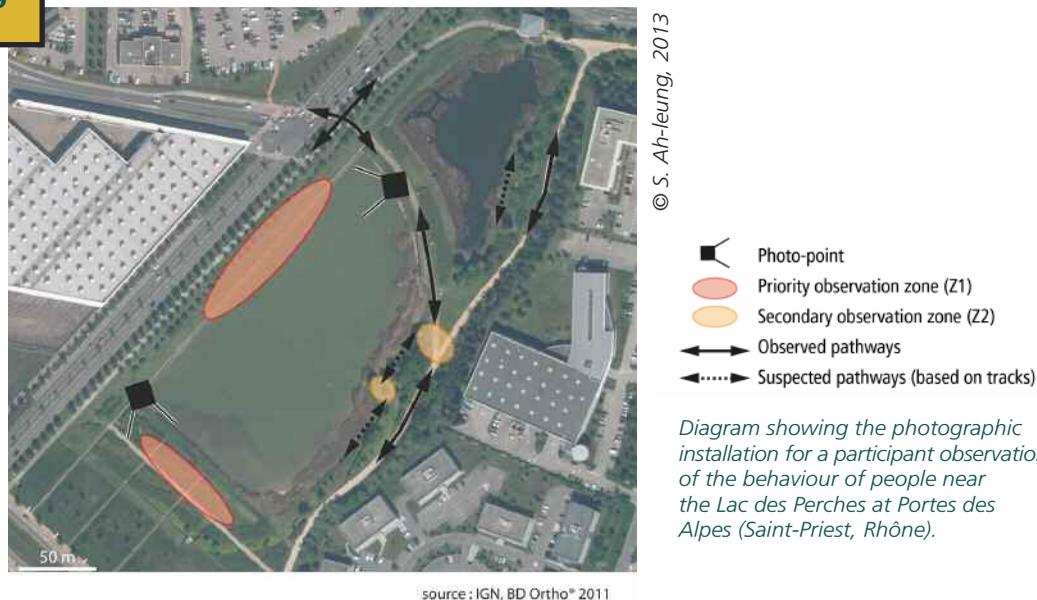
However, it is necessary to obtain the authorisation of isolated, recognisable individuals, particularly if the image may cause a problem for or bother the person. The authorisation must be written, thus providing proof that the person consented to the taking and dissemination of their image. To be valid, the authorisation for dissemination must be limited in duration and identify a specific media and use. This rule may be interpreted in different manners. For example, the courts have ruled that certain tolerances concerning the use of images are acceptable for artistic and educational projects. What is more, the authorisation of a person may be considered tacit if the person, once informed, does not oppose the use of the images (on the condition that the person had the opportunity to express their opposition) and in cases where the person is filmed in going about their public activities.

It is therefore necessary, even before obtaining their authorisation, that people be informed of the possibility that they might be photographed or filmed. Practically speaking, this can be done by setting up a sign indicating, for example, that anyone entering a given zone may be photographed or filmed for a study. Finally, in some cases, it may be necessary to request authorisation to photograph or film from the entity managing the area where the study takes place.

User perceptions and practices near stormwater-management systems, a participant-observation study

A study including participant observation was set up as part of the SEGTEUP project (Ah-leung, in prep.). The study dealt with the perceptions and habits of the public near stormwater infrastructure designed to manage rainwater (basins, reservoirs, etc.). The purpose of the study was to produce knowledge on the conditions guiding decisions concerning environmental technologies, to observe practices and the difficulties raised by environmental technologies in terms of their maintenance and management, and finally to better understand the conditions surrounding the generalisation of these technologies in urban areas. Photographic equipment was used to understand these conditions. An example is presented here, focussed on the *Portes des Alpes* basins in Saint-Priest (Rhône department) (see Figure 19).

Figure 19



The installation was used to acquire 63 hours of observation spanning the period from the summer of 2011 to the spring of 2012. The observation provided an array of information, indicating first of all that the public used the management site for many types of activities, including relaxation (sun bathing, fishing, reading, rest, etc.), sports (rugby, skateboarding, swimming, soccer) and recreation (throwing stones in the water, playing on the screen rakes or trash racks, running after the ducks, etc.). The various uses spanned the year, but also depended on the season. During the summer, the number and diversity of activities was greater, except for fishing which appeared to take place exclusively during the spring. The information on these activities also revealed the incompatibilities between the uses planned by the site manager and the effective use by the public. For example, signs signalled that it was forbidden to swim and fish in the basins, but those were two activities observed. Similarly, children were observed playing on the screen rakes. Above and beyond the danger involved, the system could be damaged and no longer able to treat the urban stormwater.

The study served to better understand the relations between the technical systems for water management and the general public. It provided the system managers (Grand Lyon urban area) with information on the unforeseen uses and potential malfunctions, thus providing them with food for thought on how to address the problem.



Practical use of knowledge of the perceptions of aquatic environments

Studies on perceptions contribute to developing knowledge on stakeholders and their expectations with respect to aquatic environments. The four examples presented below illustrate how they (could have) contributed to informing the management of water and aquatic environments.

The Souche marches

A number of definitions have been proposed for the term "collaborative management" (Narcy, 2013; CREN, 2009). For J.-E. Beuret (2006, p.73), "collaborative management takes place in the framework of a stakeholder-involvement process, which may be understood as the collective development of questions, perceptions, objectives and/or joint projects through dialogue on an equal footing between participants who engage the process voluntarily and mutually acknowledge the legitimacy of the other participants. However, collaborative management may also include moments of simple dialogue, negotiation, consultations with certain social groups and providing information to the participants." The project, led by ADREE (Association for the development of environmental research and teaching) in the Souche marches (Aisne department), is an occasion to examine the procedures implemented and the tools used. This raises the unspoken issue of how knowledge, and consequently perceptions, are shared among the managers, local stakeholders and scientists.

The Natura 2000 site of the Souche marshes, one of the large alkaline fens in northern France, covers a surface area of 2 500 hectares. The marshes span a dozen towns and over half of the total area belongs to private owners. The Souche is also a river approximately 30 kilometres long on which development work took place long ago, perhaps even earlier than the Middle Ages, and its management is a major local issue (see Figure 20).

The stakeholder-involvement process undertaken in view of its management succeeded in overcoming a prior, conflictual situation that was particularly visible during the period when environmental measures were set up for the flat expanses. The objective was to "improve relations among the local stakeholders and elicit comprehensive projects for the sustainable development of the site". Submitted in 2003, the project received financial support from the *Fondation de France*. Since that time, it has continued with the support of the Aisne departmental council (www.naturagora.fr). Under ADREE management, the stakeholder-collaboration group was established.



a) Fens and peat bogs may be used in a number of ways, i.e. traditional uses such as peat extraction (now totally abandoned), hunting and fishing, poplar stands and, along the edges, intensive farming, and recreational uses such as nature hikes and educational excursions. b) They are also used to experiment new forms of management, e.g. weirs and grazing.

a © F. Grégoire, 2012
c © V. Pierron – CREN Rhône-Alpes, 2003

The first step in the project was to draft a Charter for the stakeholder-involvement process approved by a majority of the stakeholders (www.naturagora.fr/images/stories/les_pdf/pdf_scientifique/concertation_charte.pdf). Approximately 30 people volunteered to participate. Two potentially conflictual issues appeared, water management and path management. The "Water" discussions took place over the years 2007 to 2009, those for paths started in 2010.

Three meetings were necessary for each. The first served to establish a "meeting place" for the sharing of experience and information. The attempt to clearly delineate the problems identified by the participants was a success. The second served to define the future lines of work and to determine their acceptability. Finally, the third assessed their feasibility and the level of interest on the part of the participants for the topic of the stakeholder-collaboration meetings before transmitting the project to the public.

The "Water" cycle elicited a high degree of participation and produced a unifying project for the marshes as a whole. On the other hand, regrets were expressed concerning the slow progress of results in the field. Some thought must be put into integrating the procedure better among stakeholders because it is still overly scientific in nature. The "Paths" cycle brought to light the problems concerning travel through the marshes, path management and use, and the tranquillity of local owners. It launched a discussion on the perceptions of stakeholders and users concerning the marshes, on sharing of time and space, and on opening and closing times for the marshes.

Three conclusions may already be drawn, even though the involvement process has not been terminated and can be reactivated at any time by the participants (Grégoire, *in prep.*). The first is that the stakeholder-involvement process came into being in response to social demand. It was the participants who, in setting up the rules for the groups, proposed the topics. The second is that the participants were very pleased with the discussions. The possibility of holding meetings where immediate decisions were not required was seen as positive and there are now plans to address new topics. The third is that the group can now function autonomously. Some assistance is still needed to set up the meetings, but that support is purely material.

Peat bogs in the Rhône-Alpes region

Management of peat bogs in the Rhône-Alpes region is a rich and complex subject. It was highlighted by a thesis (Sacca, 2009) dealing with the functions of peat bogs and how they are currently perceived. An examination of statements by stakeholders reveals two main difficulties. The first is a fear of seeing the management taken over by scientific experts, generally from outside the area. The result was mutual distrust, amplified by the concerns generally accompanying environmental protection, with limitations, legal constraints, inspections and interventions in town policy being particularly feared. This defensive reaction is typical of how people often respond to environmental policies in France. For example, it led local farmers to hide the presence of protected species. "I do not tell everyone, but there are turtles here, pond turtles, and lots!", "They are looking for it [sundews], but they did not find it, so we will keep our mouth shut. No point in it." These reservations are also clear in the words of certain local officials, "We did not favour Natura 2000 due to pressures from land owners. That is why we were in no hurry to sign the papers sent by the Park concerning the work on the peat bogs." These concerns may be explained by the fact that environmentalism, "far from constituting a positive factor in local identities, would seem on the contrary to reinforce in certain people a feeling of loss of land, of autonomy, even a loss of property and thus of their patrimony" (Kalaora, 1998). In the background behind these concerns lie the actual issues, i.e. what each person risks gaining or losing. In this situation, oppositions between stakeholders may arise.

The second difficulty, linked in part to the first, lies in the major difference between how an area is experienced and perceived endogenously, and how it is experienced and perceived exogenously (see Figure 21).

Figure 21



a. © F. Grégoire, 2012
b. © C. Sacca, 2007



Fens and peat bogs are areas experienced and perceived both (a) endogenously, as shown by the signs of past production in a Montselgues peat bog, and (b) exogenously, as shown by the educational trail in the Gimel peat bog (Rhône-Alpes region).

This difference may be explained by the influence of geographic proximity in the perception of a site. An area experienced and perceived endogenously is one where people live each day. It contributes to the feeling of belonging and to the memories of the social groups that shape the area, use it and most often live in it. The area is the object of the affective ties that progressively grow between people and places (Gumuchian, 1988). An area experienced and perceived exogenously is one seen by people from other places, who are not particularly concerned with the socio-economic processes at work there. For example, a visitor over a weekend wants to find the site open and accessible, with fun and educational features, whereas the local resident desires calm and tranquillity, and will likely disapprove of anything threatening that. There is therefore conflict between the needs and concerns of local residents and those of people from outside the area, which can result in high tensions. The differences between endogenous and exogenous perceptions would thus appear to be fundamental. Taking them better into account would make it possible to avoid certain conflictual attitudes.

Understanding perceptions is a means to become aware of conflicts, latent tensions and unspoken opinions that can obstruct future measures, and to come to know the area, which enhances credibility and mitigates the impression of exogenous management, often a source of conflict. In light of the difficulties presented above, a stakeholder-involvement process is often a useful technique in taking into account the diversity of stakeholder groups and their opinions. Improved acknowledgement of the perceptions of each person, as well as better management of tensions, therefore requires the acquisition of greater knowledge in this field.

To assist in carrying out such procedures, various tools can be used to clearly express the diversity of viewpoints. Geo-conceptual diagrams are a good example of how this can be done (see the Focus section on geo-conceptual diagrams below).



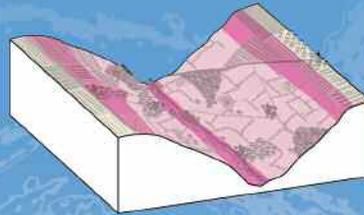
Geo-conceptual diagrams to express and spatialise diverse viewpoints

The wide variety of viewpoints on a river, collected during interviews with different categories of stakeholders, can be summed up using geo-conceptual diagrams (i.e. drawing or mapping opinions on the landscape level). That was the decision made in studying the Mue, a small river flowing in a valley to the west of the city of Caen (Calvados department), on a plateau characterised primarily by cereal farming and threatened by urban sprawl (Germaine, 2009). Each geo-conceptual diagram presents a viewpoint on the valley (see Figure 22). It has its own specific key adapted to the vocabulary and system of values used by the people in each category to describe the landscape. It is the objective criteria in terms of usage that determine how people judge an area's opportunities and limitations for their purposes. For example, farmers judge land very differently depending on whether they intend to use it for livestock farming or cereal cropping. In the first case, low-lying areas in the valley bottom are seen as good land, whereas in the second, they are deemed very difficult and even unusable. Finally, geo-conceptual diagrams are a means to spatialise perceptions (Michelin, 2000). On the one hand, the full extent of the living space becomes visible and often exceeds the area on which managers focus (entire valley vs. river corridor). And on the other, the various points of interest are pinpointed. For example, in the Mue valley, the river is of central interest to elected officials (flood risks) and managers, whereas the residents see the valley bottom as particularly attractive (recreational activities, rest and relaxation) in spite of the many difficulties in settling there or even gaining access. There is also significant pressure on the valley crests offering views that are prized for residential purposes. Finally, certain structures (mill, bridge) or other aspects such as the bocage landscape draw the attention of certain groups of buyers.

The Mue valley seen by...

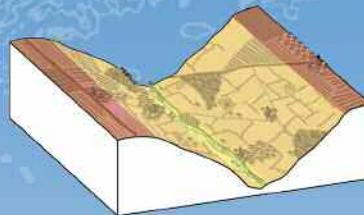
1. residents

- Living area
- desirable
 - agreeable
 - of no value



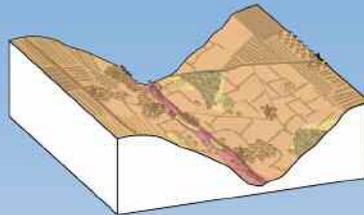
2. cereal farmers

- good land
- moderately good land
- difficult land
- unusable land



3. livestock farmers

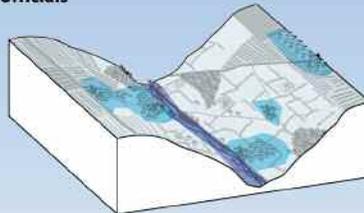
- good land
- moderately good land
- difficult land
- unusable land



4. managers and elected officials

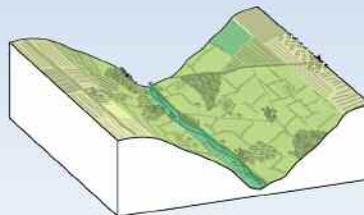
Areas for which they are...

- very focussed
- attentive
- indifferent



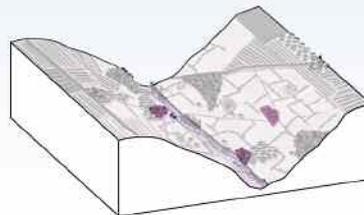
5. nature groups

- exceptional value
- remarkable
- interesting
- of no value



6. tourism professionals

- exceptional value
- remarkable
- attractive
- of no value



Presentation and spatialisation of different viewpoints on the landscape in geo-conceptual diagrams.

Drôme River (Rhône-Alpes region)

The Drôme River and the adjacent groundwater are used for many purposes, including irrigation for crops, supply of drinking water and various recreational activities such as fishing, bathing and canoeing. The local biodiversity is remarkable, acknowledged and protected, notably in a nature reserve (Ramières) (see Figure 23). The first SBMP (sub-basin management plan) in France was set up for the river in 1997 and entered the revision process in 2008. The revision period is a time conducive to analysing the (new) stakeholder configurations and the (re)defined local issues concerning river management. This was done by analysing semi-structured interviews with the participants of the local water commission (CLE) (Girard, 2012; Girard and Rivière-Honegger, 2012 and 2014).

The main problem mentioned during the interviews was the lack of water in the river caused by agricultural uses. The drops in the water level, which at times could lead to the riverbed running dry, resulted in tensions among the various users of the resource (irrigating farmers, swimmers, water sports, fishing) and endangered aquatic life.

However, the standard conflict between, on the one hand, the protectors of aquatic environments and, on the other, farmers wanting to use the water for agricultural production, gave way to a very different configuration among the stakeholders. In this case, the local level in water management confronted the State representatives on the regional level and from the major river basin (regional environmental directorate, Onema, Water agency). Even though they had very different objectives, the local agricultural representatives, the environmental-protection and fishing associations, and the local elected officials all joined forces with a shared set of arguments in favour of local water management and against any form of centralised and bureaucratic management. They put forward a number of specific local features and the capacity for self-management in order to justify exemptions and adjustments to the national and European rules. The issue of how water should be shared among the various users in a given area was secondary to the issue of gaining local control over water management.

Figure 23



© S. Girard, 2011

The Ramières nature reserve in the Drôme valley has come to symbolise biodiversity protection in the Drôme River (Rhône-Alpes region).

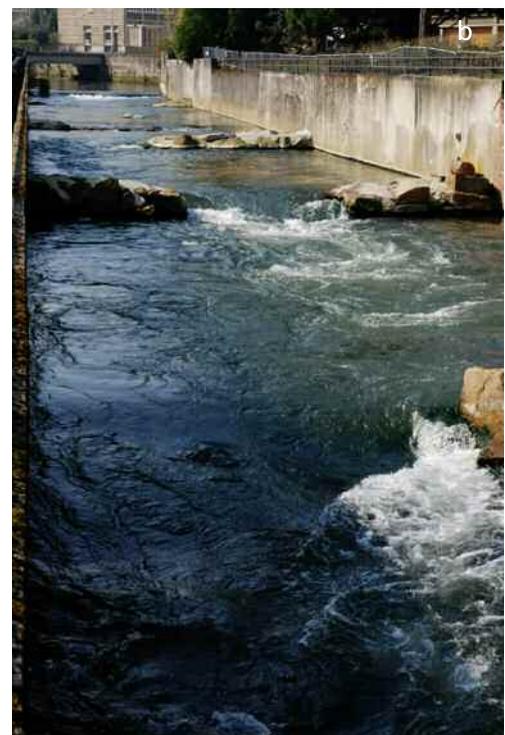
Touques valley (Basse-Normandie region)

The study of perceptions and social expectations is a means to highlight the importance of the landscape for people living along rivers. An analysis carried out in the Touques valley demonstrated the value of this type of study in anticipating the consequences of projects for landscapes and consequently in improving the acceptance of projects.

Considered the backbone of the Auge territory and presented as a structural axis, the Touques valley (Orne and Calvados departments) is characterised by its wide and straight path over 109 kilometres (Germaine, 2009). It is part of an extensive prairie system in which it occupies an unusual position (grass fattening of livestock in the regularly flooded valley bottom, cider production in the prairies on the slopes). These landscapes contribute to the excellent reputation of the Auge area for tourism, in spite of the major imbalance in terms of tourist numbers between the coast and inland.

This category-1 river in a limestone plain stands out as a reference in western France for its good ecological status and its favourable biological conditions for salmonids. Highlighted as early as 1978 in the first Salmon plan by the Ecology ministry, its potential for fish was subsequently improved thanks to 30 years of work on the banks and hydraulic structures. From 1994 to 2007, the PARAGES association carried out this outstanding management project through ecological restoration of the river (100 km of river banks, 33 structures removed, lowered or opened, 38 structures equipped with fish passes) and promotion of fishing vacations (see Figure 24). With a stock of approximately 10 000, the Touques is now considered the foremost coastal river for sea trout in France. Following the financial difficulties of the PARAGES association, the board for the Touques River basin (SMBVT) took over in 2008 to ensure continued rational environmental management.

Figure 24



Enhancement projects along the Touques River (Basse-Normandie region) for (a) fishermen along the banks and (b) canoeing and kayaking in the city of Lisieux.

In terms of the ecology and fish, the work on the Touques is a success. It is presented as an outstanding example by the Seine-Normandie water agency and Onema. However, the surveys carried out in the Touques valley on water uses revealed more diverse opinions concerning the sharing of the benefits resulting from the work (Germaine, 2011). The series of 30 interviews conducted between September and December 2008 showed that the work on the environment had direct and major impacts on the landscape. Some were positive, some were negative. In both cases, the fact that the impacts were not anticipated highlighted project limitations.

The restoration work done on the Touques since the 1990s significantly modified the river landscape. It also transformed the river's image for the residents by recreating visual access that had been lost due to a lack of maintenance. This indirect, positive result was a significant factor in the approval of the ecological restoration project by local owners and local governments. The improvement in living conditions and the greater contact with the river represented a true benefit for residents that was more readily perceptible than the increase in the numbers of fish. However, over time, the change in the landscape and the rediscovery of the river elicited new expectations on the part of the residents of the valley. Those expectations primarily took the form of requests for greater access to the river. But those requests remained unanswered because the projects never targeted anything more than environmental restoration and promotion of fishing. As a result, residents and tourists found they could not gain access to the river banks.

The example of the Touques would suggest that it is necessary to include the landscape in the preliminary studies for projects affecting aquatic environments in order to anticipate the potential transformations in the landscape and their implications for the practices and perceptions of the various users. This example shows that ecological projects can produce social benefits that should be taken into account in terms of both communication and assessment procedures because improvements in living conditions are important factors in the overall results of environmental measures. That is equally true for any negative effects that assessments should also take into account. Finally, this example shows that the results of a project, in terms of both the elements affected and the scale, can largely exceed the initial plans. That confirms the need to look beyond the river corridor and to consider aquatic environments in both their immediate and wider geographic contexts in order to take into account all the aspects involved in the many management issues (uses, practices, perceptions).



Conclusion

Study of the perceptions of the various stakeholders concerning aquatic environments produces useful information during the preliminary diagnostic phase of a project. By characterising the diversity of stakeholders and their expectations, it provides the information required to address all the issues involved when developing a project (see Figure 25).

The various case studies showed that awareness of the perceptions of the various types of stakeholders and their possible contradictions could not always prevent conflict, but it ensured better preparation for the management of the relations between stakeholders and for dealing with the debates that always take place during the formulation of management plans. Conversely, unawareness of the perceptions means that some issues will be neglected and increases the risks of setting management objectives that do not correspond to the expectations of certain stakeholders.

The examples presented in this chapter showed that the study of perceptions is based on diverse and complementary methods that, in some cases, can require a significant amount of time to implement. That is why they must be launched well in advance of project design.

Figure 25



© A. Honegger, 2010

The banks of the Drôme River.