



ASSOCIATED PROGRAMME
ON FLOOD MANAGEMENT

INTEGRATED FLOOD MANAGEMENT TOOLS SERIES

PUBLIC PERCEPTION OF FLOOD RISK AND SOCIAL IMPACT ASSESSMENT

ISSUE 25
JANUARY 2016



Global Water
Partnership



World
Meteorological
Organization

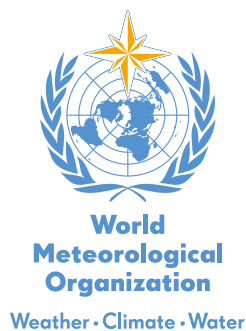
Weather · Climate · Water



The **Associated Programme on Flood Management** (APFM) is a joint initiative of the World Meteorological Organization (WMO) and the Global Water Partnership (GWP).

It promotes the concept of Integrated Flood Management (IFM) as a new approach to flood management. The programme is financially supported by the Federal Office for the Environment of Switzerland (FOEN), the French Ministry of Foreign Affairs and International Development, the National Water Commission of Mexico (CONAGUA) and the U.S. Agency for International Development (USAID).

www.floodmanagement.info



The **World Meteorological Organization** is a specialized agency of the United Nations. It is the UN system's authoritative voice on the state and behaviour of the Earth's atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources.

It co-ordinates the meteorological and hydrological services of 191 countries and territories.

www.wmo.int



The **Global Water Partnership** is an international network whose vision is for a water secure world. The GWP mission is to advance governance and management of water resources for sustainable and equitable development. The GWP network is open to all organizations which recognize the principles of integrated water resources management endorsed by the network.

www.gwp.org

To the reader

This publication is part of the *“Integrated Flood Management Tools Series”* being compiled by the Associated Programme on Flood Management. The *Public Perception of Flood Risk and Social Impact Assessment* Tool is based on available literature and draws on the findings from relevant works wherever possible.

This Tool addresses the needs of practitioners and allows them to easily access relevant guidance materials. The Tool is considered as a resource guide/material for practitioners and not an academic paper. References used are mostly available on the Internet and hyperlinks are provided in the References section.

This Tool is a “living document” and will be updated based on sharing of experiences with its readers. The Associated Programme on Flood Management encourages flood managers and related experts around the globe who are engaged in the Social Impact Assessment or whose activities are related to the perception of risk by social actors to participate in the enrichment of the Tool. For this purpose, comments and other inputs are cordially invited. Authorship and contributions will be appropriately acknowledged. Please kindly submit your inputs to the following email address: apfm@wmo.int under Subject: *“Public Perception of Flood Risk and Social Impact Assessment”*.

Acknowledgements

This Tool makes use of the work of many organizations and experts as listed in the references. Special acknowledgements are due to Mr Edoardo Guaschino, author of the first draft of this publication, and to Dr Gabriele Quinti, main author of this Tool, for their valuable expertise under the technical guidance of the APFM Technical Support Unit.

Disclaimer

The designations employed and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Meteorological Organization concerning the legal status of any country, territory, city, or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

CONTENTS

1	INTRODUCTION	1
	<i>Box 1 — Other causes of flooding</i>	2
	<i>Box 2 — Resilience</i>	2
2	THE NOTION OF SOCIAL RISK AND FLOOD RISK PERCEPTION	5
2.1	Civil defence as a response to environmental, technological and social risks	5
	<i>Box 3 — The story of the Titanic</i>	6
	<i>Box 4 — Civil security and nuclear risk: public awareness-building during the Cold War</i>	7
	<i>Figure 1 — Brochure “Survival under atomic attack!” and a poster for the short film “Duck and Cover!”</i>	7
	<i>Figure 2 — Civil defence posters from the Soviet Union.</i>	8
	<i>Box 5 — Civil security and industrial risk: The Seveso disaster (Italy)</i>	8
	<i>Figure 3 — A carabinieri posting a “No access” sign in Seveso, Italy</i>	8
2.2	The notion of risk and the notion of social risk	9
	<i>Box 6 — Civil security and transport risk: Transport of dangerous goods</i>	9
	<i>Figure 4 — Extract from the Memento of the mayor and local elected officials - Prevention of risks of natural or technological origin</i>	9
2.2.1	The notion of flood risk	10
	<i>Figure 5 — Flood risk and mitigation</i>	10
2.2.2	The notion of social risk	10
2.3	Risk awareness and perception by the public	12
	<i>Box 7 — The notion of social risk according to labour law</i>	12
	<i>Box 8 — The value of popular knowledge: the Vajont disaster</i>	12
	<i>Figure 6 — The Vajont disaster</i>	13
	<i>Box 9 — Perception of risk by the different actors</i>	14
2.4	Risk awareness and perception of the different kinds of floods	15
2.5	Recognition of flood risk awareness and perception	16
	<i>Figure 7 — Example of social mapping in the research project “Social Housing Provision and the Role of Community Architects” in Bangkok (Thailand)</i>	16
	<i>Box 10 — The United Nations PRODERE programme</i>	17
3	SOCIAL IMPACT ASSESSMENT (SIA)	19
3.1	Social impact assessment: an evolving approach	19
3.1.1	Appearance of the concept and first debates	20
3.1.2	The 1990s and the 2000s: new approaches, new criticisms	20
3.1.3	Towards an international definition of an SIA	21

3.2	Methodology: how to conduct an SIA	22
3.2.1	What is a social impact?	22
	<i>Box 11 — “Theoretical” repertory of potential social impacts:</i>	22
3.2.2	Evaluating and measuring each social impact	24
	<i>Box 12 — Stakeholders in a flood management project</i>	25
	<i>Figure 8 — The four stages of an SIA</i>	26
3.2.3	When to conduct an SIA	27
	<i>Figure 9 — The two possible phases for applying the SIA. Stages of an SIA</i>	27
	<i>Box 13 — Environmental and Social Impact Assessments</i>	27
	<i>Box 14 — Evaluating project consequences according to the method “with project/without project”</i>	29
	<i>Figure 10 — The SIA context</i>	30
3.2.4	Principles for optimizing implementation of an SIA	31
	<i>Box 15 — Stages in an SIA: A complementary approach</i>	31
3.2.5	Advantages of an SIA	32
3.2.6	Supplementary annotations	32
3.3	How to use the findings of an SIA	33
4	SOCIAL IMPACT ASSESSMENT IN THE CASE OF FLOODS	35
4.1	Several types of SIAs	35
4.2	Introductory remarks	36
4.3	Social impacts in the case of floods	37
	<i>Box 16 — Selected repertory of potential social impacts (in relation to floods, using an IFM approach)</i>	37
4.4	Instruments for determining social impacts in the case of floods	38
	<i>Box 16 — Selected repertory of potential social impacts (continued)</i>	38
4.5	Managing SIA findings within the framework of IFM	41
	<i>Box 17 — Possible causes of conflict within a river basin</i>	42
	REFERENCES	I
	FURTHER READING	V
	ANNEX I - What is a focus group and how should one be organized?	VII
	ANNEX II - Model grid for conducting focus group within the framework of a flood-specific SIA	XI



1 INTRODUCTION

- ¹ In the field of natural hazards management, the impact of floods is increasing. According to the United Nations International Strategy for Disaster Reduction (**UNISDR**), losses due to floods and heavy rains are increasing at a faster pace than other weather hazards, particularly since 1990 (UNISDR, 2009). This is primarily due to their frequency and often to their high intensity. Between 1970 and 2010, in particular, the average population exposed to floods every year rose by 114% worldwide, whereas world population increased by 87%, rising from 3.7 billion to 6.9 billion. In addition, according to the data available to the World Meteorological Organization (**WMO**), floods were the most frequently experienced extreme event in the course of the decade (2001-2010). Eastern Europe was particularly affected in 2001 and 2005, India in 2005, Africa in 2008, Asia (especially Pakistan, where 20 million people were affected and 2,000 died) in 2010 and Australia, also in 2010 (WMO, 2011). In addition, other countries reported a great many flash floods, also in recent years. For example, in 2014, China (including the capital of Beijing) was hit by floods which caused dozens of deaths.
- ² Here, the point should be made that floods are defined in two ways: *“rise, usually brief, in the water level of a stream or water body to a peak from which the water level recedes at a slower rate”* or *“relatively high flow as measured by stage height or discharge”* (WMO and UNESCO, 2012).
- ³ The effects may be either positive (for example, by boosting agriculture or fishing or by recharging groundwater systems) or negative, for example in the event that water overflows invade areas, causing more or less significant damage.



Box 1 — Other causes of flooding

It is imperative to recall that floods are not exclusively due to overflows by watercourses (hence water level rises). Floods also occur as a result of:

- Heavy runoff, either on cropland (mud floods) or in impermeable urbanized areas;
- Ongoing groundwater level rises;
- The overflow or the consequences of the rupture of man-made hydraulic structures such as water reservoirs, dikes and pipes (agricultural water, drinking water and sanitation).

4 Since the dawn of time (WMO, 2006), civilizations have prospered on flood plains, taking advantage of the benefits of floods, which are much more than just a hazard. Housing is often located in flood-prone areas, together with economic activities. These zones often represent a major source of income, livelihood and housing for thousands of communities, while floods play a key role in these processes. Global issues such as demographic pressure, environmental degradation, climate variability and economic and social activity influence the way in which floods impact households, economic activity and the organization of social networks positively or negatively (WMO, 2009). For example, poor urban development can considerably aggravate flooding. On the other hand, land-use planning regulations limiting the development of activities likely to increase risks help reduce the exposure of economic activities to floods and to mitigate their effects.

5 According to several authors, a natural disaster is never solely “natural.” It is always associated with a body of risks concerning not only nature but also the social and economic processes flowing from the complex relationship which the various communities have with the natural environment – for example, with regard to soil use, the water cycle, land use planning, canalizations, housing, etc. In other words, the problem of natural disasters and their impact is closely linked to the socio-economic context as well as, in this connection, processes particular to development (Correa, 2011). This in turn has an influence on communities’ resilience to disasters, which is currently viewed as a key aspect to be borne in mind (UNISDR, 2011). By way of example, a flood’s impact on a community which is used to this kind of event, as we shall see below (**Sections 2.3 and 2.4**), is not at all the same as its impact on a community not familiar with this type of event.

Box 2 — Resilience

The word “*resilience*” refers in general to the capacity of an organism, group or structure to adapt to a changing environment. “*Resilience*” also means the capacity to recover or the ability of a person or community to cope with hostile conditions and to recover from a disturbance.

(FAO, date unknown)

6 In the specific case of floods, WMO underscores a recent paradigm shift: there has been a move from “flood control” to “integrated flood management” (IFM) (WMO, 2006), that is, from the “need to master” floods from a technical standpoint to the “need to manage them” from every point of view – technical but also social, political and economic, by anticipating the event rather than undergoing it. The inhabitants of flood plains are no longer seen as the unfortunate victims of a disaster; rather, they become key actors who take control of their destiny and work actively to overcome the difficulties caused by the flood. As for the bodies responsible for

organizing relief operations in case of a disaster, instead of merely dealing with a flood, they adopt a more holistic approach where the recovery phase calls for prior planning and mitigation efforts. IFM deals with the combined action of, on the one hand, the positive aspects of floods and, on the other hand, the threats which extreme events pose to sustainable development in flood-prone areas (WMO, 2006). This approach reflects the importance which is now being attached to disaster risk management, not only disaster management.

7 Living harmoniously with floods is one of IFM's key strategic options. Some communities have lived for centuries in areas exposed to flooding. Consequently, coexistence with floods must set two major goals: ensuring that a flood disturbs socio-economic activity and livelihood as little as possible; and ensuring equitable development in affected areas by improving the quality of life (WMO, 2006).

8 It will also be recalled that the people living in a given territory (whether it be in Europe or also *mutatis mutandis* in a country of sub-Saharan Africa) are increasingly aware of the problems linked to climate change and in general feel concerned by environmental questions. As a result, they often tend to be increasingly "active" in this respect.

9 This is the background for the dissemination of the approach featuring the social impact assessment (**SIA**), a fundamental instrument in integrated flood management (IFM), given that the social dimension is now viewed as key for reducing both risks (in terms of prevention) and disaster-related losses and damage.

10 Either through imposition, democratization of political decision-making or by "mere" realization (or understanding) of its theoretical/conceptual usefulness (or better still, need), SIA has become an important method in all phases of risk management, namely:

- Warning and prevention;
- Crisis management;
- Rehabilitation/reconstruction.

11 SIA is intended to supply the necessary knowledge to minimize risks, damage and losses (by incorporating all available information as best possible), but also to launch (or back) a social process aimed at maximizing consensus and the active involvement of social actors.

12 SIA also promotes knowledge of the characteristics of the communities affected (or potentially affected) by disasters in order to be able to offer and appropriately manage prevention and humanitarian aid. Taking account of these specificities makes it possible to develop sustainable tools for promoting community resilience. It also acts as a form of awareness-building for populations by leveraging their knowledge of the territory in which they live with a view to better prevention before a flood.

13 This paper is designed to stimulate thinking on how to conduct an SIA in the specific case of flood management. It is meant for various audiences interested in preventing and managing the risks linked to floods: geologists, hydrologists and other experts; sociologists and social assessment specialists; public administration officials; social operators; leaders of civil society organizations, etc. Each of these target publics is familiar with some of the arguments which we are going to take up but not the others. Hence the need for us to tackle all of these arguments



using language that is understandable to all and demonstrating argument by argument, which could seem excessively generic or superfluous to some but necessary to others.

- 14 The first chapter deals with the notion of risk, particularly that of social risk. Accordingly, the question of “popular” perception and awareness of risks is taken up, the point being made that risks vary depending on the actors concerned by a flood. It is therefore important for those in charge of a social impact assessment to factor in both the contextual aspects of a flood and the way in which it is perceived. In **Chapter 3**, we illustrate a social impact assessment and show how to conduct one in the concrete case of integrated flood management. Then, in **Chapter 4**, we provide examples of methodology to be followed. Finally, **Annexes I and II** present the notion of focus groups and an example of a grid for conducting their in an IFM context.



2 THE NOTION OF SOCIAL RISK AND FLOOD RISK PERCEPTION

- ¹⁵ In this chapter, we shall start with some background on the notion of risk and its institutionalization. We shall also deal more specifically with the notion of social risk.
- ¹⁶ Subsequently, we shall mention the main characteristics of public perception (as well as social actors' awareness) of flood risk.
- ¹⁷ In conclusion, we shall give some generic indications before highlighting risk awareness/knowledge in a given community. Additional information on risks and perception of risks by the social actors is presented in (WMO, 2015).

2.1 Civil defence as a response to environmental, technological and social risks

- ¹⁸ In recent centuries, the relationship between environmental problems and their impact on society has become a growing concern in the public domain. This new preoccupation has evolved over time, increasing interest in risk as a topic. It was above all starting in the 18th century that the State took on civil security (also known as civil protection or civil defence) as a new mission. This notion refers to the body of means implemented by a State to protect its citizens, in peacetime as in wartime. "The population of a State is now considered as a good to be protected, as a source of power through its demographic dynamism and its economic and cultural productivity. It is on this basis that a new mission has been attributed to States, that of safeguarding populations against a body of threats (epidemics, crime, etc.) but also natural disasters and those linked to technological progress" (Lascoumes, 2012). In this new framework



where society is seen as a good to be protected, the potential impacts which environmental events may have on social structure have become a new concern for public institutions.

19 Historically speaking, in the philosophy of the Enlightenment, protecting citizens against accidents and calamities (natural disasters, epidemics, etc.) became one of the duties of the State. Moreover, this is asserted in the 1789 *Declaration of the Rights of Man and of the Citizen*¹.

20 The notion of “civil security” emerged following such events as the Lisbon earthquake in 1755, which caused over 40,000 deaths, as well as the explosion in the Grenelle gunpowder factories in 1794 (Lascoumes, 2012). It was on the basis of these events that “Any facility was henceforth subject to a regime of administrative authorization. Its technical prescriptions were graduated (in particular distances from homes) on the basis of a risk nomenclature. Little by little, inspection services ensured compliance with these standards” (Lascoumes, 2012). The idea that man (or society) could be separated from nature began to disappear, giving way to a new paradigm which recognized their indissociable link and their fundamental interdependence.

21 With the scientific progress of the 19th century and the technological development of the 20th century, man started to give thought to protecting himself against dangers and disasters. Notwithstanding, some saw the sinking of the Titanic in 1912 (although this was due to a body of human errors and/or negligence in the design, building and sailing of this ship) as a demonstration that the new technologies could not always protect man from or avert perils (Lascoumes, 2012) (see **Box 3**).

Box 3 — The story of the *Titanic*

The Titanic was the famous transatlantic British ocean liner of the White Star Line which sank on 15 April 1912, less than three hours after hitting an iceberg in the North Atlantic Ocean off Newfoundland. Its construction began in 1909 in Belfast and ended in 1912. It was the largest, most luxurious passenger liner ever built at the time of its launching. It was equipped with 16 watertight compartments designed to protect the ship from major accidents and boasted the latest technology of the day (including a radio-telegraph that could send SOS signals).

The image conveyed by the media of the time was that of a reliable vessel, which was considered unsinkable even by shipbuilders. Accordingly, it was not considered necessary to equip the ship with enough lifeboats to hold all those on board. Likewise, the crew was never trained to deal with a shipwreck.

In reality, the boat was characterized by technical flaws even at the time, in particular the height of the watertight compartments and hull resistance. As a result, after the Titanic sank design modifications were made to its virtual sister ship, the Olympic.

Following the disaster, several measures were introduced to reinforce civilian navigation security. In particular, it was recognized that, despite any future improvements in ship design, a shipwreck scenario is always a possibility: even when the highest security standards are respected, residual risks remain (WMO, 2013b). An obligation was introduced whereby ships had to be equipped with enough lifeboats to hold everyone on board.

Today, modern cruise liners must be fitted with lifeboats that can hold 25% more people than the authorized capacity of persons on board.

¹ “**Article 2.** The aim of every political association is the preservation of the natural and imprescriptible rights of Man. These rights are liberty, property, safety and resistance to oppression.”

22 Subsequently, towards the end of the 20th century, events capable of destabilizing the social organization in relation to major industrial disasters and nuclear accidents were formalized as “major risks” (insofar as they were given ever closer attention by a significant share of policy-makers and the scientific community) (Lascoumes, 2012). In this way, man, technology, society and nature formed part of a single universe. Even though natural sciences continued to seek to assess risk and technological tools were refined, such changes were always accompanied by an awareness that zero risk does not exist.

23 The notion of civilian security took on special importance in the second half of the 20th century, with:

- The Cold War, especially the risk of nuclear warfare (see **Box 4**);
- An increase in the number of industrial risks (in particular, chemical risks, civil nuclear installations, pollution) (see **Box 5**);
- An increase in transport-related risks: road traffic accidents, air transport, transport of hazardous and radioactive materials (see **Box 6**).

24 In addition to natural risk and war risk, there is the risk linked to “normal” human activity (for example major events which bring together tens or hundreds of thousands of people at a single site, non-earthquake resistant buildings built in seismic zones, diseases linked to poor garbage management and inadequate sanitation, etc.)

Box 4 — Civil security and nuclear risk: public awareness-building during the Cold War

At the beginning of the Cold War, the U.S. Civil Defense tried to mitigate the effects of a potential nuclear conflict by increasing public awareness via different means. One example was the brochure “Survival under atomic attack” written for families, but there was also the short film “Duck and Cover!” teaching children what to do in case of a nuclear attack¹.



Figure 1 — Brochure “Survival under atomic attack!” and a poster for the short film “Duck and Cover!” by the United States Civil Defense. (www.commonswikimedia.org, 2014 and www.dailywav.com, 2011)

¹ For the role of the media in flood management, see (WMO, 2015).

Box 4 — Civil security and nuclear risk: public awareness-building during the Cold War (*continued*)

Likewise, in the Soviet Union, civil defence authorities increased awareness among the civilian population via written and visual communication: the examples alongside show posters dating back to 1974 providing information on the different systems for disseminating warnings in case of attack and providing tips to minimize fire-related damage.



Figure 2 — Civil defence posters from the Soviet Union.
(fireandrescuemuseum.blogspot.ch, 2009)

Box 5 — Civil security and industrial risk: The Seveso disaster (Italy)

On 10 July 1976, a highly toxic cloud containing dioxin escaped from a reactor of the Icmesa chemical plant of Meda (near Milan, Italy) and spread across four communes, the hardest hit being Seveso. Above and beyond the environment disaster (most of the plants touched by the cloud withered and over 70,000 head of cattle were slaughtered), the occupants of the worst-affected zone were evacuated eight days later and their homes destroyed, as decontamination was not an option. This accident, which gave its name to directive 96/82/EC (see <http://ec.europa.eu/environment/seveso/>) concerning production sites classified as high-risk in Europe, highlighted the dangers of industrial activities in urban areas. A similar episode, which had a much more serious impact in terms of loss of human life, took place in 1984 in Bhopal, India, due to the explosion of the pesticide plant Union Carbide India Limited.



Figure 3 — A carabinieri posting a “No access” sign in Seveso, Italy (h2it.org, 2012)

Box 6 — Civil security and transport risk: Transport of dangerous goods (TDG)

Every day, a wide variety of dangerous goods are transported throughout the world, the bulk of which is for industrial use. These goods may be transported in liquid form (e.g. hydrocarbons, chloride, propane, caustic soda) or solid form (e.g. explosives, ammonium nitrate). They are often more concentrated and more aggressive than similar products for household use.

The main consequences caused by an accident during the transport of dangerous goods are:

- A fire;
- Release of a toxic cloud;
- An explosion;
- Corrosion;
- Soil and/or water pollution.

Transport of dangerous goods (TDG) covers carriage by road, rail, air, sea, inland waterway or pipeline. As each mode of transport is very different from the others, there are specific regulations for each one. This is why legislation in this field is so abundant.

The common thread for all these regulations is that they foresee technical provisions for vehicles, monitoring arrangements and staff training. On the basis of an identification number, in particular for the type of good transported, in the event of an accident, emergency services may easily refer to the safety data sheet for the goods and receive the appropriate instructions.



Figure 4 — Extract from the
Memento of the mayor and local elected officials - prevention of risks of natural or technological origin
(www.mementodumaire.net, 2014)

2.2 The notion of risk and the notion of social risk

25

As presented in the previous section, the notion of risk is taken up in various fields. Each one develops its own definition, which is suited to its work context and often seeks to quantify risk. By way of example, a calculation formula has been developed for complex systems like industrial systems. In this case, the risk considered depends on a large number of parameters and the calculation must therefore factor in the risk stemming from individual actions or events such as (Ancey 2012):

$$\text{Risk} = \sum \text{probability of the event} * \text{its intensity} * \text{weighting factor}$$

26 Despite the wide range of existing definitions and formulae, two common elements are generally present: the probability of the appearance of an event and its consequences. With regard to disasters, the United Nations International Strategy for Disaster Reduction (**UNISDR**) defines risk as “the combination of the probability of an event and its negative consequences” (UNISDR, 2009b).

2.2.1 The notion of flood risk

27 “According to the IFM approach, flood risk is defined as the expected losses caused by a given flood at a specific period and is based on three elements (see **Figure 5**):

- The intensity of the flood and the speed of the water rise;
- The exposure of human activity to the flood;
- The vulnerability of the exposed elements.

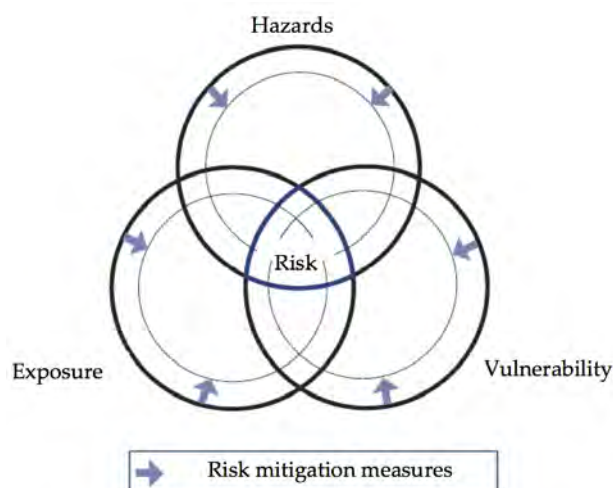


Figure 5 — Flood risk and mitigation

28 In particular, vulnerability to floods is the predisposition of a community to suffer the harmful effects of a flood. It is reflected by the powerlessness or inability of a community or group to anticipate, cope with, withstand or recover from these effects. This is the condition under which a hazard turns into a disaster. Vulnerability not only poses a hindrance when it comes to reacting appropriately, but it also increases the violence of the impact which can have repercussions long after the disaster. Vulnerability to flooding is the combination of a complex, interdependent set of dynamic factors which are mutually reinforcing and may be classified into three large groups:

- The physical or material conditions (for example, weak infrastructure);
- The constitutional conditions (for example, weak or inexistent social solidarity networks) or organic conditions;
- The behavioural or psychological conditions (for example, high dependence on foreign aid)” (WMO, 2006)

2.2.2 The notion of social risk

29 It is in this framework that the social sciences come into the picture.

- 30 The term “risk,” in the context of the social sciences, was first used by the German sociologist Ulrich Beck, who speaks of the “risk society” and attempts to highlight the media, political and scientific characteristics surrounding the notion of the social production of risk. Here, the aim is to highlight the idea that the notion of risk has become central in a society which, owing to the impact of modernization and its economic and technological processes, is increasingly turned towards the future (for example, by considering risk phenomena related to the accumulation of capital, the new borders of communication, etc.), by trying to predict causality links and “govern” the resulting uncertainty (Beck, 1986). Beck emphasizes inter alia that wealth is not the fundamental resource for managing risks. Rather, information and knowledge are the basic tools for “managing a risk” (thanks to knowledge, a vague, undetermined “danger” turns into an at least partly known risk, providing a means, as far as possible, of “controlling” it).
- 31 In a similar vein, Luciano d’Andrea and Giancarlo Quaranta (d’Andrea, Quaranta, 1996) propose an approach based on the connection between “dangers,” “social regimes” and “risks.” Dangers are defined as events or processes which are potentially beyond the control of individuals, communities and social groups. Social regimes are the body of norms, institutions, policies and other regulatory frameworks which, taken together, unleash/enhance the capability of social actors to gain control over dangers. Through these social regimes, dangers are turned into risks. This means that in fact risks are dangers which are socially managed/controlled through their identification, awareness thereof and the activation of coping measures.
- 32 Another leading sociologist who has focused on the notion of risk is Anthony Giddens (Giddens, 1999), for whom the risk present in modern societies features a different typology from the risk which characterized human society up to the end of the 19th century. In today’s societies, risks are a product of human activity (manufactured risks). They are the outcome of the modernization process as such and are only partly linked to natural factors (external risks). Risks therefore have a structural essence (that is, they are linked to the operating mechanisms of modern-day society) and cannot be managed solely on the individual level. All of this implies profound changes in the structure of social relations.
- 33 When a similar approach is used, phenomena such as unemployment, substandard health and education services, social rejection, various types of crime, poor housing and bad territorial management may be considered as social risk factors which may accompany environmental risk factors like overcrowding, different forms of pollution, housing in flood-prone areas, landslides, etc. When a single individual, family, human group or community accumulates several risk factors (and their intensity), this generates more or less serious situations of social exclusion, which in turn lead these individuals, families, human groups or communities into a process of impoverishment (Mastropietro, 2001).
- 34 Although the above comments merely serve as an introduction, they suffice to bring out the centrality of the notion of risk in the framework of contemporary social sciences (see **Box 7**).



Box 7 — The notion of social risk according to labour law

It should be noted that there is also a “restricted” notion of social risk in labour law. In this specific context, a social risk is an event which occurs during a worker’s working life. Loss of employment, illness at work or home, maternity or an accident at work constitute social risks. Such risks may lead to the payment of replacement income by the competent social security institution such as unemployment allowances, sickness or disability benefits, maternity allowances or workers’ compensation.

2.3 Risk awareness and perception by the public

35 As we have just said, when we follow Beck’s line of thinking, the presence of risks in human society leads us to pose the problem of information on and awareness of these risks. The topic of risk perception also comes into play.

36 The social sciences are starting to debate the capacity of social actors to know the risks which characterize the settings in which they live as well as (and this is the flip side of the coin) the subjectivity involved in so-called “objective” risks. As a result, social actors’ awareness and perception of risks have become a topic of interest, making it possible to see how to enhance popular information in connection with prevention while explaining people’s reaction to disasters (see **Box 8**). Ever since the 1980s, the social sciences have challenged the technological approach through a new paradigm, the social paradigm of disasters. This new paradigm, particularly influenced by the ideas provided by political ecology, features a difference compared with the technocratic vision (Anzelli & Piguët, 2012). This passage marks a major change, because risk is no longer viewed as an entity separate from man/society (that is, as something solely particular to nature) but as an entity which is also inherent to human actions and perceptions.

Box 8 — The value of popular knowledge: the Vajont disaster

One example highlighting the importance of popular knowledge dates back to the disaster of Vajont, a dam for hydroelectric energy production located in the Dolomites (Italy).

“At 22:39 GMT on 9 October 1963, a landslide dropped 260 million cubic meters of soil and rock into the reservoir, built three years previously, at a velocity in excess of 90 km/h. The landslide swept away electric power supply lines, plunging Longarone (a village located downstream from the dam) into darkness over a kilometre and a half. Two waves of 25 million cubic meters each overtopped the dam and rushed downstream. The mass of water destroyed the towns of Longarone, Pirago, Rivalta, Villanova and Faè and hit many other small villages nearby (Castellavazzo, Erto and Casso). It is estimated that the mega tsunami killed some 1,900 people. The dam was virtually unharmed.”

(Aria, 2010)

Yet the local population knew full well that the area where the dam was built was prone to landslides: the mountain proven to be the source of the landslide was called “Toc” (onomatopoeic for the sound of a rock falling), which means “rotten” in the local dialect. Despite this element (and the fact that scientific studies of the site’s geology confirmed what the inhabitants had known for generations), no attention was paid to popular knowledge and work proceeded with the development of the project called “Grande Vajont”.

Box 8 — The value of popular knowledge: the Vajont disaster (*continued*)

Figure 6 — The Vajont disaster

Cfbr, 2012: Sécurité et environnement. Risques naturels, Comité français des barrages et réservoirs, France.
www.barrages-cfbr.eu/Glissements-de-terrain.html

37 We can define perception of risks as a subjective perception of the possibility that an event will take place, according to a major or minor probability and intensity. This perception may be more or less influenced by different factors. This means that it is a very malleable idea rather than a static one: the media, channels of scientific dissemination, Internet, what the other social actors think, *inter alia*, are all elements that are capable of changing individuals' perception of risks.

38 This is also why the perception (but also the capacity for awareness) of risks may change from one context to another, depending on the geological, economic, political and social characteristics. Several studies have highlighted the link between risk perception and other factors (Kellens, Zaalberg, Neutens, Vanneuville, De Maeyer, 2011). From this literature, we deduce that the way in which different people perceive flood risks stems, among other things, from their subjective experience (how many times these people have faced flood events in their past life) and the periodicity of the phenomenon in a given territory. With respect to the latter criterion, the level of attention tends to be lower in unprotected risk areas, where floods do not occur on a seasonal basis. In such cases, the inhabitants tend to underestimate the risk (Botzen, Aerts, van den Bergh, 2009). However, in places where flood risk follows a seasonal trend, the population's perception often goes hand in hand with the risk level established by the experts but may also be overestimated or underestimated (Siegrist & Gutscher 2006). These two criteria (experience and periodicity) are of course closely linked.



39

In cases where large-scale flood protection works – dykes, reservoirs, embankments and containment walls – have been built over the years, the communities they protect mistakenly feel safe for some time. Such works are generally intended to provide protection against floods of some magnitude. In the event of flooding greater than the design flood or particular conditions which endanger the stability of the flood protection works, there is little chance that they will hold up. Accordingly, it is vital that the community concerned be aware of the limits and degree of protection which these works afford and be mindful of the residual risks. Here, emergency schemes to cope with such risks are essential when it comes to intervening in a critical situation (WMO, 2006).

40

Several other factors may influence perception of risks (WMO, 2006). Some example are given in **Box 9**.

Box 9 — Perception of risk by the different actors

Even though it is possible to evaluate perception of flood risks by a community as a whole, the point should be made that within this same community, the different actors may have differentiated perceptions of flood risk (and pay particular/little attention thereto). It is therefore important to know the demographic characteristics of the population in question and evaluate risk perception by the different groups of people:

- **The elderly:** they may suffer from illness or be more deeply rooted (for physical or cultural reasons) in their territory and hence less mobile or flexible, leading them to react less to flood risk. Moreover, these are people who have the longest historical memory and can thus remember, better than other members of the community, the floods and their characteristics which struck the territory or which they experienced in the past. More generally, people who have already experienced a flood have a higher perception (and awareness) than those with no such experience.
- **Children:** they represent a population group at greater risk than the others because their short experience and poor awareness of environmental dangers lower their level of awareness and perception in this regard.
- **The disabled:** they may react less to flood risk because of mobility-related issues (physical disabilities) or not perceive or feel concerned by flood risks owing to various neuropsychic disorders (psychic disabilities).
- **Gender:** women tend more than men to feel concerned by any problem that can affect the social fabric; as a rule, they pay closer attention to environmental risks (Cancedda, 2002).
- **Immigrants, refugees or new arrivals:** as with children, these may be people with little knowledge of the territory in which they live. However, they may also be people from areas where floods or other environmental risks are a factor and thus be very aware of such issues. Likewise, tourists visiting the risk area tend to have very low awareness and perception of floods (Burby, Wagner, 1996).
- **The well-educated:** well-educated people tend to pay more attention to and better perceive flood risks. This is particularly true of those who have pursued technical education in secondary school or, even more so, at the university level (Anses, 2007).
- **Property owners:** owners of home and/or other valuable property on the territory tend to pay closer attention to flood risks.
- **Housing:** people who live on the ground floor, have a basement or a sea (or river) view tend to have a higher perception of risk.

It is therefore important to know the demographic structure of the risk area which, albeit only one of the criteria to be taken into consideration, influences local communities' level of perception and (effective) awareness of flood risk.

41 In the next part (**Section 2.4**), we shall show how, in the case of flooding, it is possible to help fill
 in the gap between scientifically measured risks and risks perceived or “known” on the basis
 of local inhabitants’ knowledge of the territory on which they live.

42 Yet we should not forget that the proposed criteria and advice refer to the current climate
 context. Climate change is a reality, but its effects are not yet fully known. Consequently, a
 population’s perceptions could change with the variations stemming from the effects of climate
 change. It is thus essential to evaluate the perception of flood risk and climate change in a
 mutually interdependent fashion and to base ourselves on increasingly flexible approaches.

2.4 Risk awareness and perception of the different kinds of floods

43 As we mentioned above, one of the basic needs in terms of flood risk is to evaluate the link
 between the experts’ opinion of the danger and the local population’s perception of these risks,
 also on the basis of their “historical memory.” The next step is to merge the former’s technical/
 scientific knowledge and the latter’s popular knowledge so as to better develop and manage
 prevention as well as any floods, if and when they occur.

44 Three parameters characteristic of floods strongly influence the perception and level of
 awareness which the different social actors in a community may have of floods. These are:

- Rise time (flash flood, rapid flood, slow flood);
- Location (fluvial flood; coastal flood);
- Periodicity (extreme floods; seasonal/cyclical floods)

45 The level of popular awareness (as a whole and according to the categories considered) and the
 perception of risk may change according to these three variables.

46 For example, in the case of seasonal/cyclical floods, the bulk of which are fluvial floods, the
 target public may already have relatively high awareness and perception of the risk. What is
 more, these are generally floods which occur rather slowly (contrary to flash floods), making it
 easier to manage the risk situation.

47 On the other hand, with extreme floods, it is much more likely that the population concerned
 is either not aware or not fully aware of the dangers. And when this is not the case, given that
 these are events deemed to be of an exceptional nature, the precautions taken by the people
 concerned are not consistent with the actual level of danger. This state of affairs is particularly
 serious in the case of flash floods, which involve the rapid discharge of water in areas where
 communities are in all likelihood unaware or little aware of prevention measures. These are
 some of the most difficult risk situations to manage.

2.5 Recognition of flood risk awareness and perception

There are two operations which make it possible to enhance populations' awareness and perception of flood risks:

A | Map areas in a potential risk region.

48

Generally, experts, engineers, geologists, hydrologists, etc. conduct such studies with technical tools, including those particular to the geographic information system (GIS) (Denègre, Salgé, 2004). However, mapping environmental and social risks is sometimes also based on popular information, in particular the historical memory (somatic, that is, solely present "in the minds of people" and extra-somatic, that is, reproduced on written sources) of the populations who live in a given territory. Naturally, popular information will also have to be examined attentively by the technicians (such information may also be skewed by their perception). When conducting this type of exercise, it is also important to observe the points of convergence between "technical knowledge" and "popular knowledge." Joint mapping of environmental (and social) risks by technicians and inhabitants, including an effort to highlight information available in the archives (and in press coverage of previous disasters), makes it possible to optimize available information in relation to risk prevention and management (PRODERE, 1996) (see **Box 10**). WMO has also developed flood mapping instruments (WMO, 2013).



Figure 7 — Example of social mapping in the research project "Social Housing Provision and the Role of Community Architects" in Bangkok (Thailand), conducted by University College of London (UCL) and the Community Organization Development Institute (CODI) (Hunter, 2011; www.architect.com)

Box 10 — The United Nations PRODERE programme

In conjunction with several UN projects, social and environment risk maps have been developed at the local level. The prototype has been the PRODERE programme executed in Central America by UNDP, UNOPS, PAHO, the Office of the High Commissioner for Refugees and the International Labour Office.

Interaction between local communities and technicians led to the representation on geographical maps of environmental and social risk factors affecting several communities involved in the programme (PRODERE, 1996).

Similar exercises have been carried out elsewhere, including in Cambodia, Mozambique, Angola and the Balkans.

B | Subsequently highlight flood risk perception by the different actors in the communities concerned by means of specific studies (see **Box 9**).

49 Efforts to integrate all sources are particularly important. This is the step on which we shall focus and put forward an approach to be followed, because it is important that all professionals work together in this regard to draw up an exhaustive situational framework. The point should be made that the cases documented in the literature give us an idea of how to conduct useful surveys. Yet one must not forget that each context is different and that each situation must therefore be studied and viewed as unique.

50 Conducting a survey and determining the hypotheses are very delicate undertakings in such a framework. It is important to start by defining the ultimate aim of this kind of survey. This section gives suggestions for developing a general understanding of the relationship between scientific/technical knowledge of risk and the concerned population's perception/awareness of risk². These are suggestions of a very general nature, as contexts are too heterogeneous for a methodology to be represented deterministically.

51 It follows that those responsible for conducting any such survey must pay particular attention to the points below:

- Developing simple yet effective technical instruments which can supply comprehensive answers in order to arrive at as complete a picture of the situation as possible. These technical instruments may be:
 - Questionnaires for individual interviews with the “general public” with a prevalence of “closed answers” (those which feature pre-defined answers in the majority of cases);
 - Questionnaires for individual interviews of qualified experts from the community who are not directly involved in preventing and managing environmental risks (law enforcement, teachers, medical personnel, local administrators, etc.), with a prevalence for “open questions”;
 - Handbooks for interviews with technicians and other experts (including those from civil society) who are directly or indirectly involved in preventing and managing environmental risks;

² “In accordance with conventional definitions, risk is considered to be a quantifiable variable which is analysed on the basis of probabilities and consequences” (Kellens, Zaalberg, Neutens, Vanneuville, De Paeyer, 2011; Raaijmakers, Krywkow, Van der Veen, 2008).



- Handbooks for conducting “focus groups” with joint input from citizens and experts, thereby facilitating interactive, multilateral coordinated consultation (the **CMIC** approach, which we shall revert to later – see **Section 2.2**). Working through such groups also makes it possible to map popular information on environmental (and social) risks which are integrated with technical information. A detailed presentation of the work with the focus groups is given in **Annexes I and II**.
- The questionnaires should not be long. Otherwise, there is a risk that people may not put much effort into their answers, thereby distorting the questionnaire;
- If possible, overly technical words should be avoided (except for the grids for interviews with technicians and other experts) when preparing appropriate data collection tools for the levels of preparation for the different interviewees. This will ensure that the survey findings are truly useful;
- Several community representatives should be encouraged to participate actively in the conduct of the survey.

52 As was clearly explained above, highlighting popular knowledge and evaluating the perception of those concerned (by taking their characteristics into account) can significantly boost flood prevention and management efforts. This being so, it is important to arrange for a link with a nearby university institute, a research institute, a national bureau or a private office that is capable of providing the necessary high-quality expertise.

53 If it is not possible to conduct this type of survey due to geographical, economic or linguistic reasons, consideration can be given to more limited consultations, without forgetting the need for some form of coordinated, multilateral and interactive consultation including the holding of at least one focus group. More subtle adaptation to local needs, be they human or environmental, will facilitate longer-term efforts to increase communities’ awareness of flood risk (WMO, 2007).

54 In conclusion, we feel some comments are in order:

- First of all, due account should be taken of two very widespread tendencies: heedlessness and denial. In the former instance, people do not feel concerned by a risk definition approach and refuse to participate; in the latter case, they completely ignore the danger (Brilly and Polic, 2005).
- Second, those in charge of prevention must be able to motivate citizens to themselves take the precautions that will pay off in terms of their personal safety in their homes and at their workplaces. This can only succeed if those in charge manage to develop and fine-tune their fellow citizens’ perception of risk. If this is done, not only will people display a more realistic attitude towards flood risk, but their efforts will bolster policies aimed at limiting flood risk and its consequences (Botzen, Aerts, van den Bergh, 2009).



3 SOCIAL IMPACT ASSESSMENT (SIA)

55 After this overview of risk perception and awareness by a community's social actors, in this part we shall present the social impact assessment (SIA) and examine how it can be a useful tool for flood prevention and management (in the context of the paradigm of integrated flood management, or **IFM**).

56 We shall begin by giving a brief background for the SIA. A second part is devoted to a discussion of methodology, to determine how to conduct this type of evaluation. A third section provides an overview of managing the findings of an SIA, while the last section takes up all of the elements covered and proposes an approach for conducting a flood-specific SIA.

3.1 Social impact assessment: an evolving approach

57 The notion of a social impact assessment was primarily designed in two contexts:

- In conjunction with evaluations of programmes, policies and projects of public interest as an “arm” of the environmental impact assessment (**EIA**), in terms of their impact on societies/ social actors (UNEP, 2002);
- In relation to social entrepreneurship (in the broad sense of the term), in order to determine whether and to what extent social companies, associations and foundations of a social and cultural vocations and other similar organizations actually work for the good of society rather than for the good of a few (AVISE, ESSEC, MOUVES, 2013) and thus understand the social changes produced by their activities.

58 There is no officially recognized or universally shared definition of an SIA, and the debate on how to conduct an SIA has evolved over time.



3.1.1 Appearance of the concept and first debates

59 Along with the other types of impact studies (environmental, health, etc.), the concept of social impact assessment (**SIA**) appeared during the 1970s, as an offshoot of an emerging problem concerning public and private investment: in their search for short-term economic profits, the promoters of such investment tended to overlook the negative impacts generated for the communities involved, in environmental, social and economic terms (Bauer, Thomas, 2006). Accordingly, some research projects began to examine how to conduct investment impact assessments so as to limit their negative effects on society and amplify their positive effects. This consideration, based on a cost-benefit approach, was the first of several factors leading to the development of the SIA.

60 In the course of the 1980s, SIAs became increasingly important, above all with regard to major investments by international financial institutions (such as the World Bank), especially those relating to major infrastructural works such as dams and reservoirs, roads, industrial installations, power plants and mine developments. These institutions began to recognize a recurrent, growing problem: some of these projects did not meet their main goal, that of benefiting the persons concerned and promoting sustainable development. On the contrary, they even led to the opposite result.

61 Consequently, a new approach to the design, implementation, follow-up and evaluation of development projects gradually began to take root. According to this approach, “ensuring, according to precise criteria, that the projects proposed are not only profitable from an economic standpoint but also protect the physical and social environment in the community in which they will be executed” (Bauer, Thomas, 2006 ; Broche. et al. 2005 ; Rabel, 2002 ; Vanclay, 2003), was given as an essential postulate. The SIA thus became a useful practice for determining in advance and during implementation to what extent and how development projects impact the communities involved positively or negatively.

3.1.2 The 1990s and the 2000s: new approaches, new criticisms

62 Nevertheless, and despite the fact that people and their social and natural environment – and not solely economic costs and benefits – were now at the heart of the discussion, several researchers and practitioners highlighted certain contradictions which continued to feed the debate on SIAs. During the 1990s and the 2000s in particular, fresh criticisms were expressed concerning the way in which SIAs were designed. Here are a few:

- Evaluations were concerned by and for researchers, without involving the people concerned using participatory methods. This meant that the way in which surveys were carried out reflected only one side of the issues, leaving aside once again the main aim: ensuring that the human and social dimensions are indeed at the heart of matters;
- SIAs tended to focus solely on planned projects, leaving aside other potential impacts, such as those stemming from so-called “natural”³ or technological, or the social interventions of social entrepreneurship and civil society;

³ However, some SIAs relating to environmental events were carried out in the 1970s, including in the case of floods, see for example (Mack, 1973); we shall revert to this in Section 4.2)

- The “social dimension” and “society” tended to be contextually generalized, glossing over the particularities of each context and each community (cultural practices, traditions, relationship with the natural environment, among many other aspects);
- The time axis was only factored in for some studies. As a result, many evaluations lost their value as the impacts changed over time, either naturally or because the programmes/projects moved ahead);
- A more general criticism put forward during this period was that SIAs should not stop at a rhetorical stage (in this respect, one spoke of the sociologists or, more specifically, the experts in charge of the SIAs as “notaries of failed development”) but should adopt a pragmatic approach, in order to, on the one hand, reorient operations underway in a project/programme/investment; and on the other hand, to actively encourage the actors of a community to strengthen their capacities, engage in networking, etc.).

⁶³ The aspects mentioned above are but a few of the criticisms made which, rather than preventing the implementation of the SIAs, helped build a sounder conceptual and methodological base. Temporal and contextual considerations gained importance within the SIAs; participatory approaches became more widespread; SIA findings were incorporated into programme/project management, etc. Yet disagreements persisted. In particular, during the 2000s, there was no official definition of an SIA (UNEP, 2002) or even a general, internationally accepted definition.

3.1.3 Towards an international definition of an SIA

⁶⁴ Over the past decade, researchers and practitioners have tried to agree on a definition of an SIA and on how it could be applied in the different contexts. Even though the debate is still open, today, the social impact assessment may be defined as follows:

“The SIA is the process whereby one develops an analysis, follow-up and management of the expected and unexpected social consequences, both positive and negative, of both planned interventions (policies, programmes, plans and projects) and unplanned ones. In addition, the SIA is designed to shed light on the processes of social change invoked by these interventions, as its main aim is to develop a more equitable and sustainable biophysical and human environment.”

(Vanclay, 2003)

⁶⁵ In other words, social impact studies are designed to:

- Identify a project’s impacts on the social plane;
- Predict the environmental repercussions (in the broad sense of the term) already at the project design and planning stage;
- Find ways of mitigating adverse impacts;
- Prepare projects which are suited to the local social environment;
- Present decision-makers with forecasts and options.

⁶⁶ This conceptual basis, which is generally widely accepted, has facilitated efforts to start building a consensus among the main protagonists of functional SIAs to avoid, prevent and correct the negative effects of planned and unplanned events on the people/communities involved. A series of values, principles and approaches have been proposed to ensure that SIAs are conducted as effectively as possible.



67 In the following section, we are going to sum up some of the key aspects which must be taken into consideration when implementing an SIA.

3.2 Methodology: how to conduct an SIA

3.2.1 What is a social impact?

68 To understand how to conduct an SIA, it is essential to know what a social impact is in practice.

69 Social impacts may be defined as the consequences for people of an action which modifies their lifestyle, working mode, relations, organization and role as individuals and members of society (UNEP, 2002). This definition encompasses, inter alia, socio-psychological changes, which affect for example people's values and attitudes and their perceptions of themselves and their community and environment. Some SIA practitioners consider that social impacts include both personal living conditions (e.g. stress and other forms of disruption) as well as changes which impact society as a whole (e.g. overpopulation, pressure on infrastructure, poverty) (World Bank, 2003).

70 **Box 11** contains a composite (albeit non-exhaustive) list (Vanclay, 2006) of potential social impacts. However, these need to be checked for relevance in every given situation or country, for example with regard to development goals or essential needs for food, water and shelter (which is why we call this list as a "theoretical repertory"). Not all SIA practitioners have adopted the classification of the impacts or all of the impacts inventoried. Moreover, numerous impacts among those listed are not easy to measure and require the analysis of a number of variables.

71 It should be noted that the impacts listed in the following box are not, by definition, all negative.

Box 11 — "Theoretical" repertory of potential social impacts:

Individual and family:

- 1 Death, death of a family member
- 2 Arrest, imprisonment, detention, torture, intimidation or other human rights violations inflicted upon an individual
- 3 Reduced availability of food and an adequate diet
- 4 Reduced control of fertility (availability of contraception and self-reliance)
- 5 Reduced level of health and fertility (child-bearing ability)
- 6 Reduced mental health, increased stress, anxiety, alienation, apathy, depression
- 7 Uncertainty as to impacts, development opportunities and social changes
- 8 Personal security status, exposure to risks
- 9 Experience with stigmatization and deviancy
- 10 Decline in the perceived quality of life
- 11 Decline in living standards or level of affluence
- 12 Worsening of the economic situation, drop in the value of property income
- 13 Decrease in autonomy, independence, security and livelihood
- 14 Change in status or type of employment, or redundancy
- 15 Fewer opportunities for work, potential diversity and employment flexibility
- 16 Moral violence, blasphemy, religious insult, desecration of sacred sites

Box 11 — “Theoretical” repertory of potential social impacts *(continued)***Individual and family** *(continued)*:

- 17 Pushback (objection/opposition to the project), NIMBY attitude
- 18 Dissatisfaction with a project which has not met high expectations
- 19 Nuisance (dust, noise, foreigners, crowds)
- 20 Disruption of everyday life, lifestyle (changing habits)
- 21 Decline in the value of environmental commodities
- 22 Perception of the community, community cohesion, integration
- 23 Community's identification and relationship with the place (belonging)
- 24 Change in attitude towards the local community, level of satisfaction with the neighbourhood
- 25 Disruption of social networks
- 26 Modification of family structure and stability (divorce)
- 27 Domestic violence
- 28 Gender relations within the family
- 29 Modified cultural values
- 30 Modified perceptions of personal health and security, risk, fear of crime
- 31 Modified leisure opportunities
- 32 Housing quality
- 33 Impact on the homeless
- 34 Density and crowds
- 35 Aesthetic quality, insight, visual impacts
- 36 Workload, amount of work required to survive/live decently

Community and institutions:

- 1 Death of people in the community
- 2 Violation of human rights, of freedom of expression
- 3 Adequacy of the community's physical infrastructure (water supply, sewers, services and commodities)
- 4 Adequacy of the community's social infrastructure (health, well-being, education, libraries, etc.)
- 5 Adequacy of the community's housing
- 6 Workload for institutions, local authorities, regulatory bodies
- 7 Cultural integrity (maintenance of local culture, tradition, rites)
- 8 Rights to resources and access thereto
- 9 Influence on cultural heritage and other major archaeological, cultural or historical sites
- 10 Loss of the local language or dialect
- 11 Cultural impoverishment
- 12 Equity (economic, social, cultural)
- 13 Changes in problems of equity/social justice involving minority or indigenous groups
- 14 Gender relations in the community
- 15 Economic prosperity
- 16 Dependence/autonomy/diversity/viability of the community
- 17 Unemployment level in the community
- 18 Opportunity cost (loss of other options)
- 19 Real crime
- 20 Real violence
- 21 Social tensions, conflicts or serious divisions within the community
- 22 Corruption, credibility and integrity of the government
- 23 Level of community participation in decision-making
- 24 Social values of cultural heritage and biodiversity



72 The list which we have just presented may serve as a reference point but, as has already been emphasized, a specific repertory of potential social impacts should be prepared on a case-by-case basis.

73 Accordingly, in this connection, when defining or conceptualizing social impacts, it may be useful to bear in mind the following categories (which may change from one community to another, or over time) (Vancley, 2003).

- People's lifestyle: how they live, work and interact on a daily basis;
- Their cultural identity: habits, obligations, values, language, religious beliefs, customs, aesthetics and cultural heritage, feeling of belonging, security and liveability, aspirations for the future;
- Their community: cohesion, character, stability, services and infrastructures, volunteer organizations, activity networks;
- Their political system: the level of people's participation in decision-making, as well as the way in which resources are shared and distributed in order to promote democratization;
- The environment, air and water quality, availability and quality of food, the disaster risk level, health quality, as well as access to and control over natural resources;
- Health: including physical, mental, social and spiritual well-being, and not only considered as the absence of disease;
- Personal and property rights: guarantees to ensure that people are not economically affected or disadvantaged in terms of civil and political liberties;
- Fears and aspirations: their perception of security, their fears with regard to the community's future, as well as their own aspirations for the future and for future generations.

And also (UNEP, 2002):

- Demographic change, for example, size and composition of the resident population, arrival of migrants (stable or temporary);
- Economic change, for example, new employment/income models, real estate speculation (marginalization of elderly long-term residents);
- Environmental change, for example, changes in land use, the natural habitat and the hydrological regime (loss of livelihood in the community which depends on resources);
- Institutional change, for example, in the structure of local government or traditional leadership, zoning and land tenure regulations (reduced access or loss of control leads to the disempowerment or impoverishment of the established population).

3.2.2 Evaluating and measuring each social impact

74 The identification of potential social impacts is the starting point for any SIA (see **Figure 8**). The next step is to determine which impacts may effectively be verified (in the case of an ex ante analysis) or which have been or are being verified (in the case of an ongoing, terminal or ex post analysis).

75 In the majority of cases, all that can be done is to determine whether an impact is (or may be) present or not and to describe it, even if quantification is not possible.

76 In this respect, opting for qualitative methods makes it possible to gather viewpoints and testimony from stakeholders. A “stakeholder” is defined as any person or organization who has an impact on the project or is impacted by it (see **Box 12**).

Box 12 — Stakeholders in a flood management project

With the IFM approach (WMO, 2006), the stakeholders concerned by a flood management project may be broken down into the following seven groups:

- a Ministries, public departments and bodies;
- b Communities at risk from flooding;
- c Other communities from the same river basin;
- d Scientific institutes;
- e Registered non-governmental organizations;
- f Benevolent organizations;
- g The private sector.

77 One particularly suitable method is the Coordinated, Multilateral and Interactive Consultation (CMIC) approach⁴, whereby all stakeholders are consulted and their viewpoints are compared interactively. If possible, this is done by convening a focus group where stakeholder representatives are both present and interact directly with each other with a help of a moderator (see **Annexes I and II**). If this is not feasible, this is done through successive consultations of stakeholder representatives making it possible to gradually identify the viewpoints as they emerge (all are informed of the viewpoints expressed by the persons consulted previously in relation to each social impact).

78 The interaction generated by this approach (or similar methods) provides an opportunity to step back and reconsider the purpose of the action/project/programme or event whose social impact is being evaluated. However, this kind of summing-up is not always obvious: the repertoires of potential impacts, as set out in the box below, may help by schematizing the expected effects of a given project/action/event⁵.

79 As far as possible, it would be appropriate to not only identify and describe impacts which can actually be verified (from an ex ante perspective) or which have actually been verified (from an ex post perspective) but also to quantify these impacts.

80 In this respect, the procedure to be followed should include two stages:

A | Determining and measuring the impact indicators (perhaps a proxy) ;

81 Indicators meet three main goals:

- Monitoring the impact of an action/event;
- Managing it (where possible) by setting objectives;
- Communicating.

⁴ An example may be found in (Cancedda A., 2005): *Skilled Migrants Integration Assessment Model – SMIAM, Guidelines*. Rome, Laboratorio di Scienze della Cittadinanza. www.scienzecittadinanza.org/public/SMIAMLGeng.pdf

⁵ See also the theory of change: www.theoryofchange.org

82

Such indicators may be measured using figures (e.g. revenue growth, drop in the occurrence of disease) or depend on observations or statements (number of persons who say that they have improved their self-confidence or display better skills). They may also be “proxies”, that is, they do not directly measure the phenomenon (in our case the impact of interest to us) but only measure part of it or measure a phenomenon which is correlated, that is, for which we assume that the change (or, better still, the variation over time or in space) is similar. Thus, changes in mortality rates, where such rates are high, give a good idea of changes in the health status of the population concerned.

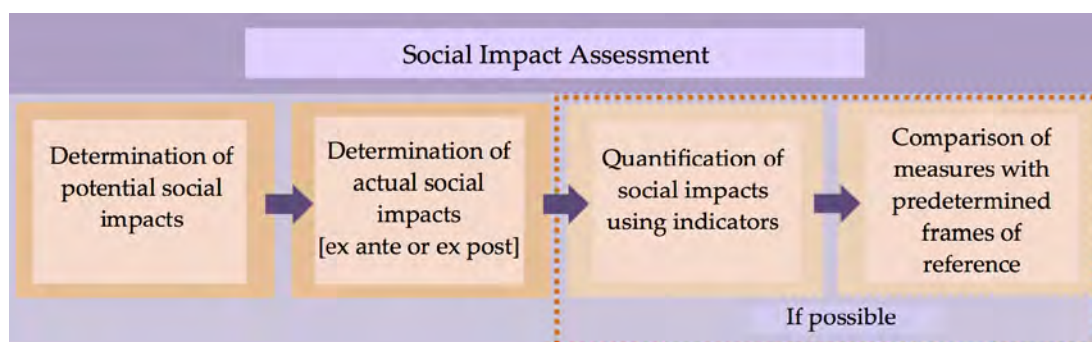


Figure 8 — The four stages of an SIA

83

Choosing the right indicators implies a precise idea of what one wishes to measure and why (AVISE, ESSEC, 2013). It may be appropriate to construct them jointly so that they make sense for all stakeholders, that is, all of the actors concerned (in particular, in our case, the qualified community experts directly or indirectly involved in the prevention and management of environmental risks, including local administrators, technicians, civil society leaders, etc.).

84

An indicator is often constructed on the basis of a continuous variable which has been discretized dichotomously (yes/no) or in classes, giving priority to relative values (rank) rather than absolute ones. A number of qualitative indicators are sometimes expressed in the form of proportions (for example, as percentages) to facilitate perception of an order of magnitude of the phenomena observed or their changes. Some indicators may be applied directly to elementary units (e.g. individuals, households or homes). In such cases, a composite indicator may be constructed for all of these units (average, % of units below a certain threshold, etc.). This is the type of indicator that is most commonly used to monitor situations at the level of populations.

85

The value of an indicator lies in the comparisons it allows:

- Between the goals and reality, in time, in space, between different projects or situations;
- The thought processes to understand gaps;
- The resultant actions.

B | Positioning oneself in relation to a repertory (AVISE et al., 2013)

Repertories, or even standards/norms, make it possible to position oneself in relation to the indicators defined and used by others. They confer legitimacy, allow comparisons and facilitate external recognition. Nevertheless, they are still relatively underdeveloped as far as issues linked to social impacts are concerned.

These repertories may be perceived as restrictive and requiring compliance with objectives which are far from the project mission. Some are more dynamic than others, as their designers are attentive to users' proposals⁶.

3.2.3 When to conduct an SIA

Social impact assessments (just like EIAs, see **Box 13**) are mainly conducted prior to the implementation of a programme/project (thus from an "ex ante" perspective) in order to understand which social impacts it could generate and thus be able to take steps to eliminate/minimize any future negative impacts. At this stage, an SIA may be conducted, taking into consideration several alternatives for the implementation of a programme/project in order to identify the one which, in terms of social impacts, features the most advantages and the fewest drawbacks. In a similar vein, an SIA should be conducted before a calamitous event occurs in order to understand what steps can be taken to eliminate/mitigate the negative social impacts.

Box 13 — Environmental and Social Impact Assessments

Environmental and social impact assessments are sometimes conducted. One example among many is the "Environmental and social impact assessment – project for laying pipelines to cross the Vridi canal in Côte d'Ivoire" (Foxtrot International, 2012) carried out by Nexon Consulting for Foxtrot International.

This study is especially interesting because, even though it concerns a specific project (the laying of pipeline), it also looks at which happens in relation to seasonal flooding in the Port-Bouet area.

An SIA may also be conducted during the execution, in the final phase or after the conclusion of a programme/project or along with the execution of activities by organizations of a social nature (such as those dealing with social entrepreneurship) in order to evaluate the social impacts which have already appeared/are appearing/may appear. Likewise, an SIA should be conducted after a calamitous event has occurred to understand its effects and identify steps to mitigate its negative social impacts.

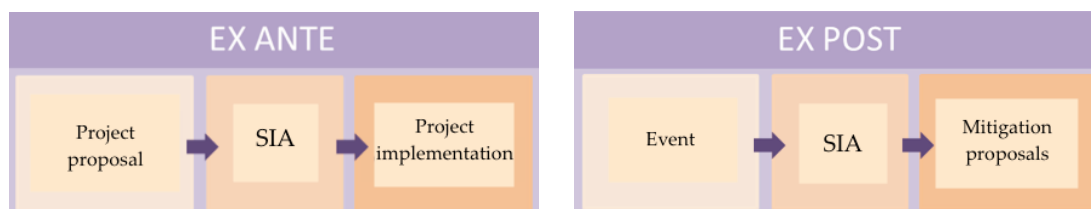


Figure 9 — The two possible phases for applying the SIA. Stages of an SIA

⁶ See the **IRIS** indicator base (Impact Reporting and Investments Standards). It proposes reporting standards for the performance of social impact or environmental investments. It is an open-ended tool, which draws on suggestions by practitioners: <http://iris.thegiin.org/>

90 Until now we have examined what a social impact is and how it can be evaluated in order to understand how an SIA is designed today. Now we are going to try and describe which operations can be carried out in conjunction with an SIA in order to develop subsequently a flood-specific SIA.

91 An approach aimed at assessing social impact is a project in itself, with its goals, stages, timetable, team and tools. We must not forget that the methods are a means, not an end in themselves. Depending on their objectives and their constraints, some will be more suitable than others. All will have advantages and limits.

92 Whatever the method chosen, it is recommended to map the stakeholders and define their level and form of involvement at the outset. This precaution is essential. However, it requires an awareness that any solicitation of feedback takes time and that reaching agreement is not always easy.

93 Vivek Misra suggests following the steps below when conducting an SIA (Misra, date unknown):

I | Describe the human environment (area of influence) and the basic conditions. These include:

- The characteristics of the population;
- The community and institutional structures;
- Political and social resources;
- Individual and family changes;
- Community resources.

II | Develop an effective public plan which involves all potentially concerned actors. This includes:

- Conducting surveys with the persons concerned (community leaders, women's groups, cooperatives, etc.), in order to identify their main concerns, wishes and expectations;
- Combining these surveys with other studies (environmental, economic, etc.).

III | Identify the full range of potential social impacts. This includes, in particular:

- Demographic and epidemiological characteristics;
- Land-use planning (including infrastructures);
- Built land characteristics;
- The natural environment;
- Forms of the local economy;
- Cultural/religious/linguistic linkages;
- People's lifestyle;
- Health and education services, and collective interest services in general;
- The functioning of institutions, the political system, civil systems, community organization; law and order and security, crime, forms of governance.

94 More generally, it is appropriate to refer to the repertoires of potential social impacts and topics for consideration listed above).

IV | Evaluate social impacts:

95 This covers a series of analyses aimed at describing and measuring, as far as possible, the potential impacts (from an ex ante perspective) or real impacts (from an ex post perspective). To do so, it is essential to include the persons concerned, as they are the ones who will determine the impacts to which they may be subjected during the construction of a development project (or, in our case, the occurrence of a flood which could jeopardize their living conditions, socio-economic development, etc.) (see in this respect **Section 3.2**).

V | Predict the responses/reactions of people and communities to impacts:

96 Factors such as loss of land, structures, livelihood, crops and lack of access to public infrastructures may be considered as direct social impacts. However, impacts are not merely direct. And above all, in the vast majority of cases, it is very difficult (especially from an ex ante, hence projected perspective) to accurately determine cause-and-effect relationships. Different social impacts are the result of several factors which are partly independent of the programme/project or event in relation to which the SIA is being conducted (see **Box 14**). In addition, it must be borne in mind that social impacts may appear much later. It is therefore important to evaluate the way in which people will react to these “long-term” impacts over time.

Box 14 — Evaluating project consequences according to the method “with project/without project”

The analyses conducted in points **I** to **V** make it possible to identify potential changes (from an ex ante perspective) or real changes (from an ongoing, terminal or ex post perspective) but do not always provide proof that they are due to the project/event studied.

There are methods which try to answer the question: what would have happened without the project/event?

These methods linked to an “experimental” or “quasi experimental” schema, which compares a “with project/event situation” with a “without project/event” control situation, are relatively cumbersome and difficult to implement effectively in the majority of cases.

97 Here as well, community participation, particularly the involvement of community leaders, should be strongly encouraged: from a forecasting perspective, it furthers understanding of people’s expectations and fears in relation to potential impacts, as well as the way in which they project themselves into a crisis situation generated by an undesirable event.

VI | Develop a plan for monitoring and mitigating impacts; take functional steps to minimize negative social impacts – from an ex ante perspective – or “correct” their effects (from an ex post perspective).

98 We shall revert to this point later on in **Section 3.3**. But we can already stress that, especially from an ex ante perspective, an SIA must not be conducted solely as a tool for predicting potential social impacts but should also provide a basis for helping to minimize them or, from an ex post perspective, to mitigate them over time.

99

This implies the preparation of a Social Management Plan (Misra, date unknown), whereby the following aspects are taken into consideration:

- Specify the quantity of people concerned and describe their demographic, economic and social characteristics;
- Introduce measures to minimize (or mitigate) social impacts (particularly when these may be very significant, as in the case of relocation of people/communities), also on the basis of consultations with the people concerned;
- Develop a legal framework and institutional arrangements for implementing the measures identified; a participatory approach with active consultation (if possible, here as well, by adopting a CMIC approach) of all stakeholders is also essential in this phase.

100

This last point is particularly important, because it highlights the way in which changes may be managed and monitored after the event. Yet the other factors are also important, as they aim at reducing/minimizing impacts ex ante or mitigating them ex post.

101

Figure 10 sums up the ideas presented with a view to clarifying the phases which can be followed in implementing an SIA.

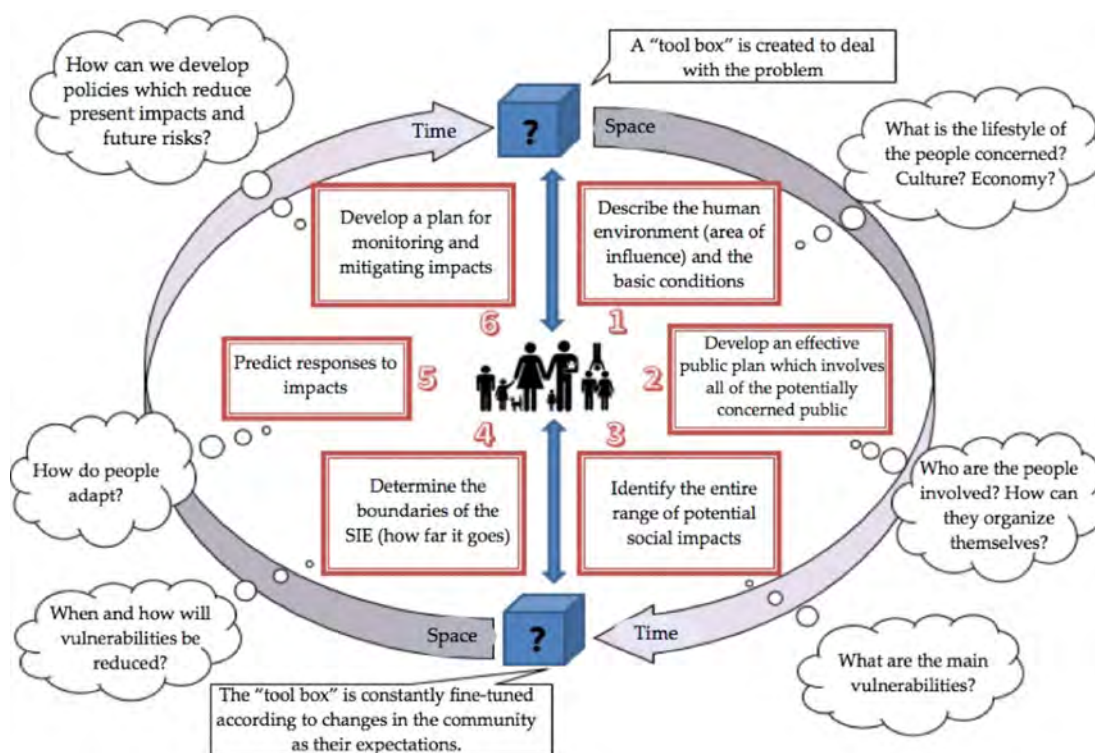


Figure 10 — The SIA context

102

Box 15 below shows another way of formalizing the different stages of an SIA. The steps proposed, albeit not identical, are fully compatible with those described above.

Box 15 — Stages in an SIA: A complementary approach (ICGP, 1994; UNEP, 2002)

- 1 Involvement of the public – develop and implement an effective plan to involve the public in order to get all those concerned and all stakeholders on board.
- 2 Identification of alternatives – describe the proposed action and reasonable alternatives, including the alternative “no intervention”.
- 3 Profile of the basic conditions – document the relevant human environment/area of influence of the proposal and existing social conditions and tendencies (with the characteristics and variables described above).
- 4 Definition of the scope of the impact study – identify and classify by order of priority the probable social impacts by using different means, including discussions or interviews with potentially affected people.
- 5 Projection of estimated effects – analyse and predict the probable impacts of the proposal and alternatives in relation to the basic conditions.
- 6 Forecasting and evaluation of reactions to impacts – determine the importance of the social impacts identified for the people who will be affected.
- 7 Estimation of indirect and cumulative impacts – identify the repercussions of the proposal, including second- and third-order impacts and their incremental impacts when these are combined with other past, present and foreseeable activities.
- 8 Changes in alternatives – recommend new or modified alternatives and evaluate or predict their consequences for the people affected and the actors concerned.
- 9 Mitigation – develop and implement a mitigation plan by order of preference to avoid, minimize and offset unfavourable impacts.
- 10 Monitoring – develop and implement a programme for identifying any deviations from the proposed action and unforeseen major impacts.

3.2.4 Principles for optimizing implementation of an SIA

- 103 To conduct an SIA as satisfactorily as possible, it may be important to pay attention to the following elements (ICGP, 1994):
- Involve the different publics – identify and involve all potentially affected groups and individuals;
 - Analyse the targets of impacts – identify winners and losers and underscore the vulnerability of under-represented groups;
 - Focus on evaluation – take up the public’s problems and concerns which are important, not only those which are ‘easy to grasp’;
 - Identify methods and hypotheses and define their importance – describe the execution of the SIA, the hypotheses used and the means of determining their importance;
 - Provide planners/decision-makers/technicians with information on reactions to social impacts – identify problems which could be solved by modifying the proposed programme/project (or the planned prevention actions) or proposing alternatives;
 - Rely on SIA practitioners – trained specialists who use social science methods will give the best results;
 - Prepare monitoring and mitigation programmes – manage uncertainty by monitoring and mitigating unfavourable impacts;
 - Identify data sources – use documents from the social sciences and secondary and primary data from the affected region;
 - Foresee gaps in the data – report any incomplete or missing information and give the reasons why it was not possible to obtain it.



104

At the same time, it is essential to make every effort to reduce bias and to factor in the consequences of such prejudices for underprivileged, marginalized groups. SIA practitioners warn of the following factors (UNEP, 2002):

- Spatial bias – information gathering focuses on accessible locations and overlooks remote or nomad communities;
- Seasonal bias – an SIA may be conducted at a time when it is difficult to obtain representative information on an affected community, for example during the harvest or hunting season, or holidays;
- Personal bias – consultations and interviews may be dictated by cultural traditions or executive bodies; for example, they may be limited to political leaders, the elderly or men;
- Professional bias – a lack of interaction between the specialists of various disciplines may lead to the omission of important links between the environment and society.

3.2.5 Advantages of an SIA

105

Conducting an SIA may offer several advantages, especially in an *ex ante* context (hence, in the case of flooding, in the prevention phase), whether it be in relation to a development programme/project or in relation to a specific event (feared or actual, such as a flood).

- Reduced impact of the event on communities or individuals – identification of mitigation measures is an integral part of an SIA;
- Increased benefits for the persons concerned – preparation of an SIA also makes it possible to identify measures such as professional training programmes;
- Delays and destruction avoided – a well-prepared SIA shows that social impacts are taken seriously and contribute to the development of preventive measures;
- Reduced costs – early treatment of social impacts and mitigation measures make it possible to avoid costs relating to mistakes or corrective action which may be necessary at a later stage;
- Better relations with the community and stakeholders – experience has shown that an SIA helps to overcome fear and concerns and establish a basis for the necessary trust and cooperation, whether it be in the framework of a development project or the prevention/management of an environmental risk;
- Awareness-building – an SIA is an important awareness-building tool for communities, as it makes inhabitants more aware of risks;
- Improved proposals – an SIA provides information which adds value to existing projects and facilitates the design of future projects;
- Better viability of the project/programme in question (thanks to all of the points summed up).

3.2.6 Supplementary annotations

106

In conclusion, here are some further considerations concerning SIAs.

- In all of their phases, SIAs require a multidisciplinary approach with the active involvement of sociologists, economists, social psychologists, hydrologists, geologists, etc.
- SIAs may be (and often should be) a large-scale study requiring a considerable quantity of human and financial resources which are not always available. In addition, to ensure that

the findings are used effectively, SIAs should be conducted within a short time frame. Insufficient resources or a lack of time are arguments sometimes put forward to justify non-implementation of SIAs, which means foregoing all of the advantages we have enumerated above. However, SIAs may be implemented at different levels. Accordingly, it is necessary, in the start-up phase, to:

- Try to mobilize every resource possible;
- Define an SIA plan which is compatible with the resources and time which are actually available;
- In any event, avoid giving up on conducting an SIA due to a lack of time or resources.

3.3 How to use the findings of an SIA

107 With an SIA, the emphasis is on mitigating the unfavourable impacts of a proposal or event such as a natural risk, and at a more general level, on managing the resultant social changes.

108 The goals are, by order of priority, avoiding, reducing or minimizing impacts and finally offsetting them. Social impacts may be avoided by changes “at the source”, for example by selecting a site for a dam or airport in such a way as to avoid relocating people or disturbing their lives. Impacts can be mitigated through various measures, such as soundproofing for homes located in the noise footprint of an airport, programming of traffic due to road works, use of dust suppression techniques, etc. Compensation should only be paid for residual impacts if there are no other ways of guaranteeing that the persons concerned are not worse off than before.

109 If compensation is inevitable, it is often inappropriate to supply it solely in monetary form. This is invariably the case with indigenous populations and other vulnerable communities, who cannot reproduce their lifestyle elsewhere or modify the impacts suffered. In other cases, monetary compensation obliges individuals or the community to solve the problem themselves rather than leaving it up to those responsible for the impact. Similarly, innovative positive compensation measures may be used in certain cases with a view to supporting social development which would not otherwise be feasible.

110 We shall recapitulate below the main steps to be considered in mitigating social impacts which may stem from the implementation of a programme/project or the occurrence of a dangerous event (UNEP, 2002):

- Give priority to avoiding social impacts;
- Minimize them as far as possible;
- Identify mitigation measures for each impact;
- Adapt them to the different groups affected;
- Guarantee that impacts are not borne disproportionately by a single group;
- Increase benefits for the local population through professional training and development measures;
- Use compensation as a last resort;
- Treat displacement/relocation as a special case;
- Improve the livelihood of displaced persons.



4 SOCIAL IMPACT ASSESSMENT IN THE CASE OF FLOODS

¹¹¹ It goes without saying that a flood is not a programme/project or a set of actions. Thought can sometimes be given to projects/programmes to mitigate their impacts and manage floods in such a way as to maximize the net benefits they provide. However, where there is a lack of resources, it is necessary to implement strategies “to live with flooding”. At this point, we shall take up the main elements covered up until now and draw up a methodology or, better still, a few guidelines which are easy to understand and use when conducting a social impact assessment in relation to flood management, within the framework of a strategy of “living with flooding”.

4.1 Several types of SIAs

¹¹² We can conceptualize four types of SIAs which may be carried out in conjunction with flood management:

- ^a Evaluating the social impacts which a flood might generate if and when it occurs;
- ^b Evaluating the social impacts generated by a flood which has already occurred;
- ^c Evaluating the social impacts which programmes/projects conducted to mitigate the effects of a flood could generate;
- ^d Evaluating the social impacts generated by programmes/projects conducted to mitigate the effects of a flood.

¹¹³ In cases (a) and (c) we are in an “*ex ante*” perspective, whereas in cases (b) and (d) we are in an “*ex post*” perspective.

¹¹⁴ Cases (c) and (d) are similar to any other development programme/project. Accordingly, all we have to do is “simply” put the indications presented in **Chapter 3** into practice.



115 In the following pages, we shall therefore concentrate on cases (a) and (b) and look through the previous pages, highlighting what could be the specific characteristics of a SIA for floods.

4.2 Introductory remarks

116 We shall begin with a “historical” comment: although it is true that SIAs have long concentrated on development or similar programmes/projects and very little on environmental impacts, it is also true (as we have already noted in **Section 3.1**) that a few social impact assessments of floods were carried out in the 1970s (Mack, 1973). Even though there were not many, other SIAs directly related to floods were carried out in the 1980s and 1990s (see, for example, Morris & Simonovic, 1997).

117 And now for three “contextual” remarks:

- The effects of a flood are not all necessarily negative – a flood may have several positive efforts.

As regards the implementation of an SIA for floods, we shall however concentrate on the negative social impacts, in particular on the negative effects of flooding resulting from significant water level rises (without however excluding the positive impacts).

- There are several types of floods, including extreme/non-periodic floods and periodic/cyclical/seasonal floods.

For the latter, the distinction between an “ex ante perspective” and an “ex post perspective”; that is between cases (a) and (b) in **Section 4.1**, loses its meaning: the SIA will be “ex post” in relation to past manifestations of flooding and “ex ante” in relation to its future manifestations.

However, the distinction between the two perspective remains valid for extreme floods, for which, working from an “ex ante” perspective, we can perhaps refer to previous manifestations of floods which, however (given their exceptional nature) in all likelihood took place (if such floods did occur) in a socio-economic context that was very different from the present one.

- It is necessary to delineate clearly the territorial scope of an SIA in relation to the floods. It may vary from a given locality (rural or urban) to an entire river basin.

This is an extremely delicate question, because measures which might be taken to eliminate/mitigate the negative social impacts in one locality or in a body of localities might aggravate them in another part of the same river basin.

According to the IFM approach (WMO, 2006), the entire river basin must be viewed as an entity in its own right and managed on the basis on its hydrological limits, not its political or administrative boundaries. Moreover, steps must be carefully designed, taking care to impact the basin as a whole as little as possible.

Accordingly, conducting an SIA for an entire river basin would be ideal, in order to take due consideration of any conflictual situations which could be generated (“ex ante”) or have been generated (“ex post”). However, this is not always possible:

- Due to a lack of resources;
- For institutional reasons – the SIA may be commissioned by a local authority which covers only part of the basin;
- Given the pronounced local nature of an SIA.

4.3 Social impacts in the case of floods

118 With the IFM approach (WMO, 2006), an SIA must be integrated into the strategy envisaged by
this approach in order to better understand how it acts on such factors as poverty and changes
in community structure. It is also necessary to evaluate its repercussions on the environment.

119 Accordingly, it is quite feasible to consider (as a baseline) an inventory of the social impacts
presented in **Section 3.2** (see **Box 11**), in terms of both persons/families and of communities
while “reading” them from the perspective which we have just described. In **Box 16** below,
purely for information, we carry over the list of potential social impacts which we feel are the
most relevant from this perspective.

Box 16 — Selected repertory of potential social impacts (in relation to floods, using an IFM approach)

Individual and family:

- 1 Death, death of a family member
- 3 Reduced availability of food and an adequate diet
- 5 Reduced level of health and fertility (child-bearing ability)
- 6 Reduced mental health, increased stress, anxiety, alienation, apathy, depression
- 8 Personal security status, exposure to risks
- 10 Decline in the perceived quality of life
- 11 Decline in living standards or level of affluence
- 12 Worsening of the economic situation, drop in the value of property income
- 13 Decrease in autonomy, independence, security and livelihood
- 14 Change in status or type of employment, or redundancy
- 15 Fewer opportunities for work, potential diversity and employment flexibility
- 17 Pushback (objection/opposition to the project), NIMBY attitude
- 18 Dissatisfaction with a project which has not met high expectations
- 20 Disruption of everyday life, lifestyle (changing habits)
- 21 Decline in the value of environmental commodities
- 22 Perception of the community, community cohesion, integration
- 23 Community's identification and relationship with the place (belonging)
- 24 Change in attitude towards the local community, level of satisfaction with the neighbourhood
- 25 Disruption of social networks
- 30 Modified perceptions of personal health and security, risk, fear of crime
- 31 Modified leisure opportunities
- 32 Housing quality
- 33 Impact on the homeless
- 35 Aesthetic quality, insight, visual impacts
- 36 Workload, amount of work required to survive/live decently

Community and institutions:

- 1 Death of people in the community
- 3 Adequacy of the community's physical infrastructure (water supply, sewers, services and commodities)
- 4 Adequacy of the community's social infrastructure (health, well-being, education, libraries, etc.)
- 5 Adequacy of the community's housing
- 6 Workload for institutions, local authorities, regulatory bodies
- 7 Cultural integrity (maintenance of local culture, tradition, rites)

Box 16 — Selected repertory of potential social impacts *(continued)***Community and institutions** *(continued)*:

- 8 Rights to resources and access thereto
- 9 Influence on cultural heritage and other major archaeological, cultural or historical sites
- 13 Changes in problems of equity/social justice involving minority or indigenous groups
- 15 Economic prosperity
- 16 Dependence/autonomy/diversity/viability of the community
- 17 Unemployment level in the community
- 18 Opportunity cost (loss of other options)
- 19 Real crime
- 21 Social tensions, conflicts or serious divisions within the community
- 22 Corruption, credibility and integrity of the government
- 23 Level of community participation in decision-making
- 24 Social values of cultural heritage and biodiversity

120 As with any other SIA, with floods as well, the inventory of potential social impacts will have to be prepared on a case-by-case basis. Naturally, the categories suggested previously (see **Section 3.2**) retain their usefulness (lifestyle of persons, cultural identity, community, political system, environment, health, personal and property rights, fears and aspirations).

4.4 Instruments for determining social impacts in the case of floods

121 As with any SIA, with floods as well, to identify the impacts which could effectively be verified (if we are in the process of conducting an ex ante analysis in relation to “extreme” floods) or which have been verified or are in the process of being verified (if we are in the process of conducting an analysis of periodic/seasonal floods or, in any case, floods which have already occurred), gathering the points of view and testimony of all stakeholders is indispensable.

122 And it is from this perspective that we must take into consideration that which was said in the previous part of this document (see **Chapter 2**) concerning the awareness and perception which the different social actors who live in the territory concerned by this phenomenon have of flooding.

123 The most important exercise is to work up a map of (potential) social impacts of flooding by combining popular knowledge and technical knowledge at the level of each local community in a river basin. The delimitation of each community may be done in three different ways:

- On an administrative basis (for example by municipality or fraction of a municipality in the case of cities); this is the most simple solution, but may not always be appropriate (as administrative limits are sometimes “artificial”);
- On a “social” basis, that is, by considering what the local populations consider as each specific community; however, this type of solution may not be viable if there is no consensus on the matter at the local level;
- On a “territorial” basis, that is, by considering, for example, the population of a valley as a specific community.

124

The procedure to be adopted is differentiated according to two major categories of cases:

- **Case 1:** Situations where there is significant information on floods which have already occurred (the case of periodic/seasonal floods or an extreme flood which has already occurred in the recent past);
- **Case 2:** Situations where there is no significant information on floods which have already occurred (the case of an ex ante SIA in relation to an extreme flood which has not occurred in the recent past).

125

In **Case 1**, the procedure to be followed could be the one described below (taking up, mutatis mutandis, the approach proposed by (Misra, date unknown):

I | Describe, as with any SIA:

- The human environment and basic conditions (as was already said previously) and thus the characteristics of the population;
- The community and institutional structures;
- The political and social resources;
- The community resources; etc.

II | Other useful tools, where they exist, are flood hazard maps and flood risk maps, which provide information on past floods and the possible magnitude of future floods and on other related questions as well as any other historical documentation, in particular (but not exclusively) documents relating to the last flood, the damage and other effects recorded as well as the immediate needs it created.

III | All of the information under the previous points should be used to prepare a repertory (along with maps, if possible) which prima facie contains basic information on the probable magnitude of floods, flood-prone areas and the populations living in these areas and the social impacts on them as well as the responses/reactions of the people and communities to the impacts, as identified in the sources consulted. Moreover, as we have already pointed out (see **Section 2.5**), WMO has already developed such flood-mapping instruments (WMO, 2013).

IV | This repertory (along with maps, if possible), should prima facie be brought to the attention of a more or less broad body of stakeholders depending on the human and territorial dimension of the community in question (between 20 and 100 people). These will be representatives of stakeholders (in particular the qualified experts from the community directly or indirectly involved in the prevention and management of environmental risks, including local administrators, technicians and civil society leaders, but also a few people living in the different flood-prone areas). Although these people may be interviewed individually, as far as possible, it would be best to consult them via one or more focus groups (the ideal solution would be to organize a focus group for each specific territorial micro-area) led by a coordinator and based on the CMIC approach (Coordinated Multilateral and Interactive Consultation – see **Section 3.2.2** as well as **Annexes I and II**). All of the information contained in the repertory could be confirmed/challenged/enriched by the different people consulted. During this consultation, there is a need to:



- Take into consideration the strong points and limits of the different people as regards their knowledge of the territory where they live and their perception of floods (see **Section 2.4**)
- Interactively discuss all elements of the repertory (the probable magnitude of floods/ flood-prone areas, the effects on people and families, the effects on the community, etc.), reaching a consensus if possible. Such a consensus does not imply unanimity of views among the people consulted, but rather convergence between the people who hold significant information in relation to each element considered.

V | Through this (complex) operation, we move from a *prima facie* repertory to a “real” repertory of high-water rises/floods and their social impacts. It would be appropriate at this point to validate the document by means of one or more public initiatives (during which final “corrections” could possibly be made), involving as broad an audience as possible (in particular, all stakeholders should be on board) and giving rise to an open, well-documented debate which is transmitted, if possible, by the media in various forms. This (these) validation initiative(s) will thus play an important role in disseminating information and increasing awareness among (all) local actors of floods and their social impacts (a factor which can enhance community resilience).

VI | Once it has been validated, the “real repertory” will have to be “translated” into a technical document in which, as far as possible, indicators will be constructed which also refer, as appropriate, to repertories. This document will have to be shared with all stakeholders, including local, provincial and national authorities, voluntary organizations, etc. and submitted to decision-making bodies.

126 In **Case 2**, (situations where there is no significant information on floods which have already occurred), the procedure to be followed is more problematic, because:

- There is little or no documentary or archive information that can be exploited;
- Popular knowledge of local floods is very limited (or non-existent) because there is no popular “memory” in this respect;
- For this same reason, flood perception by the different community actors is very limited (barring a few exceptions).

127 As a result, there is very little information available at the local level on floods, their social impacts, and the reactions of people and communities to these impacts.

128 It follows that stage I may be identical whether information is available or not. **Stages II and III** (utilization of historic documents and preparation of the *prima facie* report) must be replaced in **Case 2** by a simulation prepared at the technical level (by analysing the demographic and epidemiological characteristics, land-use planning, the characteristics of built-up areas, the forms of the local economy, services and infrastructures, the functioning of institutions, etc.). This should be accompanied by surveys with the people concerned (community leaders, women’s groups, cooperatives, etc.) in order to identify their main concerns, wishes and expectations, combined with other impact studies (if they exist) relating to other environmental risks or projects/programmes which may have been conducted in the same area.

129 **Stages IV, V and VI** may be carried out in a similar way as with **Cases 1 and 2**.

130 At the end of this process, the SIA should have provided a detailed overview of risks as well as an analytical table of flood hazard risks, their effects on socio-economic well-being, social impacts and the vulnerability of communities to floods.

131 Consulting the public and ensuring its participation are the key elements of an effective social impact study. Participation at the drafting stage consists of defining the modalities of the study and contributing to its implementation. If the decision falls to the authorities, establishing a dialogue and soliciting the views of the populations concerned enables them to have an impact on the decision-making process by raising questions which must be borne in mind with regard to the design and scope of the project, management plans, mitigation of effects and follow-up, and the evaluation of other solutions.

132 On the whole, all of the indications carried over in **Section 3.2**, particularly in the part **Principles for optimizing implementation of an SIA, Advantages of an SIA** (apart from the one relating to **Best viability of the project/programme in question** and **Supplementary annotations** are also valid for flood-specific SIAs.

4.5 Managing SIA findings within the framework of IFM

133 In general terms, we may refer to **Section 3.3**, which may be integrated with some of the specific indications relating to the IFM approach, as formulated in (WMO, 2006) which we deem particularly relevant (in relation to an SIA), as those which follow.

134 With the IFM approach, any flood management policy is aimed at:

- Reducing risks, limiting loss of life;
- Increasing the economic, social and environmental efficiency of the flood-prone areas;
- Safeguarding the principles to be followed with regard to equity;
- Prioritizing the measures chosen ahead of a disaster and those following it, and the types of incentives and deterrents to be used;
- Defining the way in which the residual risks will be dealt with.

The findings of an SIA must be used from this perspective.

135 As has already been said, regardless of the fact that specific SIAs may be carried out at a local level, their findings should in any event be managed at the river basin level. It is appropriate to recall that IFM (WMO, 2006) is aimed at reducing flood risks through a judicious set of measures relating to the magnitude of the hazard on the one hand and to the population's exposure and vulnerability on the other hand. These flood risk reduction measures must be accompanied by water resources management and development activities in the basin. In order to reduce risks, any changes made to the upper, middle or lower reaches through development activities must be taken into consideration. In this respect, conflicts of interest/situations may arise in which a sector of the population exposed to floods runs the risk of suffering the negative effects of activities exercised in another part of the basin (see **Box 17**). Two mechanisms (to be kept in mind in the post-SIA phase) have proven their worth when it comes to managing conflicts linked to water resources management and flood mitigation measures: incentives and compromises.



- 136 In the event of a disaster (or extensive damage caused by a flood), an SIA should be conducted immediately and the findings used as soon as the reconstruction phase begins. Moreover, there is a need to gather information on not only the disaster and its effects but also on relief operations in order to fine-tune future operations.
- 137 In conjunction with the IFM approach and as far as this document is concerned, when managing the findings of an SIA, it is fundamental to:
- Give all stakeholders, especially citizens, an opportunity to exchange their points of view and to influence the final findings;
 - Seek a consensus and enlist the public's support for the findings;
 - Deepen the protagonists' commitment;
 - Ensure the application of the flood management plans for a river basin, with the unconditional support of the local population;
 - See to it that plans and the related decisions are long-term in nature;
 - Develop the resilience (or capacity for recovery) of the communities exposed to floods.

Box 17 — Possible causes of conflict within a river basin

The factors likely to generate disputes within a river basin (which should be borne in mind when managing the findings of an SIA or, better still, the joint findings of an SIA and an EIA, especially from an ex ante perspective) are the following:

- a Demographic pressure resulting in urbanization, thereby contributing to the aggravation of flood hazards downstream;
- b The transfer of downstream risks through a reduction of the volumes stored upstream;
- c Unprogrammed infrastructures such as roads and bridges which hinder natural drainage and increase the risk of flooding downstream;
- d Modification of the natural flow due to structural measures and their effects on ecosystems downstream;
- e Modifications in land use downstream, which contribute to flood hazards upstream;
- f Insufficient exchange of data and information;
- g Works such as the dewatering of a channel leading to more intense and more frequent flooding in another part of the basin;
- h Exposure of the most underprivileged, especially those in urban areas, to greater risks;
- i Uneven access to resources (information and data, capital, men and material), leading to a lower level of protection

(WMO, 2006)

REFERENCES

- A
- Ancey, C., 2012: *Notes de cours*. Risques hydrologiques et aménagement du territoire, Environmental Hydraulics Laboratory, Swiss Federal Institute of Technology in Lausanne (EPFL), Lausanne, Switzerland.
lhe.epfl.ch/cours/masterSIE/cours-master_sie.pdf
- Anses, 2007 : *Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail (French Agency for Food, Environmental and Occupational Health Safety)*.
www.sante-environnement-travail.fr/minisite.php?id_rubrique=914&id_article=3758
- Anzellini, V. and E., Piguët, 2012: *Entre désastre et réinstallation: le déplacement des populations suite à la catastrophe de Gramalote, Colombie*. Master's thesis, Institute of Geography, University of Neuchâtel.
http://doc.rero.ch/record/30475/files/memoire_Anzellini_Vicente.pdf
- Aria, 2010 : *Déferlement de 50 millions de m³ d'eau au barrage du Vajont, fiche N° 23607, Ministère du développement durable (French Ministry of Sustainable Development) – DGPR/SRT/BARPI, France*.
www.aria.developpement-durable.gouv.fr/wp-content/files_mf/FD_23607_Vajont_Italie_1963_.pdf
- AVISE, ESSEC, Institute of Innovation and Social Entrepreneurship, Mouvement des entrepreneurs sociaux (Movement of Social Entrepreneurs) (MOUVES), 2013: *Petit précis de l'Évaluation d'impact social*, Paris, ISBN :979-10-91375-04-7.
www.avise.org/ressources/petit-precis-de-levaluation-de-limpact-social
- B
- Bauer, I. and K. Thomas, 2006: *Communautés et entreprises: les a priori qui faussent les outils d'évaluation d'impact social*. *Revue internationale de sciences sociales*, 189(3): 535-549.
www.cairn.info/zen.php?ID_ARTICLE=RISS_189_0535
- Beck U. 1986: *Risikogesellschaft - Auf dem Weg in eine andere Moderne*. Frankfurt, Suhrkamp. ISBN 3-518-13326-8
- Botzen, W.J.W., J.C. Aerts and J.M. van den Bergh, 2009: *Dependence of flood risk perceptions on socioeconomic and objective risk factors*. *Water Resources Research*, 45: 1-15.
qap2.onlinelibrary.wiley.com/doi/10.1029/2009WR007743/pdf
- Broche, K., K. Broche, M. Capron and F. Quairel-Lanoizelee, 2005: *Grands projets et exercice de la responsabilité globale : les études d'impact social*. *Management & Avenir*, 3: 121-152.
www.cairn.info/revue-management-et-avenir-2005-1.htm
- Burby, R. J. and F. Wagner, 1996: *Protecting tourists from death and injury in coastal storms*. *Disasters*, 20: 49–60.
www.ncbi.nlm.nih.gov/pubmed/8867510



- C Cancedda A., 2002: *Women for Conflict Resolution and Consensus-building in Angola; Guidelines*. Rome, CERFE, European Union.
www.asdo-info.org/public/Angolaengl.pdf
- Corrao S., 2000: *Il Focus Group*. Milano, Laboratorio sociologico, Manualistica, didattica, divulgazione, Franco Angeli.
- Correa E., 2011: *Populations at Risk of Disaster: A Resettlement Guide*. Washington D.C., The World Bank, Global Facility for Disaster Reduction and Recovery (GFDRR).
www.gfdr.org/sites/gfdr/files/publication/resettlement_guide_150.pdf
- D D'Andrea L. and G. Quaranta, 1996: *Civil Society and Risk*. Contribution for a General Theory. Papers presented at the CERFE workshop – Amsterdam School of Social Research, Amsterdam, February 26 1996.
- Della Ratta-Rinaldi F., 2007: *I gruppi come strumento di ricerca sociale*. In *Ricerca sociale. Tecniche speciali di rilevazione, trattamento e analisi* (Cannavò L. and L. Frudà), Roma, Carocci editore.
- Denègre J. and F. Salgé, 2004: *Les systèmes d'information géographiques, Coll. Que sais-je? No. 3122*, 2nd edition. Paris, Presses universitaires de France (PUF).
- F Food and Agriculture Organization of the United Nations (FAO), date unknown: *Measuring Resilience: A Concept Note on the Resilience Tool*. Food Security Information for Decision Making. Concept Note. Rome, FAO
www.fao.org/docrep/013/al920e/al920e00.pdf
- Foxtrot International for the Government of Côte d'Ivoire, 2012: *Etude d'impact environnemental et social – projet de pose de pipelines traversant le canal de Virdi*, Nexon Consulting, Republic of Côte d'Ivoire and Foxtrot International, Abidjan, Côte d'Ivoire.
www.miga.org/documents/Etude_ElImpact_Environnemental_Social_Block_Cl.pdf
- G Giddens A., 1999: *Risk and Responsibility*. The Modern Law Review, 62(1): 1-10.
- Greenbaum T.L., 1998: *The Handbook for Focus Group Research*. London, SAGE Publications.
- I Interorganizational Committee on Guidelines and Principles for Social Impact Assessment, 1994: *Guidelines and Principles for Social Impact Assessment*. U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA) Tech. Memo. NMFS-F/SPO-16.
www.st.nmfs.noaa.gov/tm/spo/spo16.pdf
- K Kaufmann J.-C., 1996: *L'entretien compréhensif*. Paris, Ed. Nathan.
- Kellens W, R. Zaalberg, T. Neutens, W. Vanneuville and P. De Maeyer, 2011: *An analysis of the public perception of flood risk on the Belgian Coast*. Risk Analysis, 31(7): 1055–1068.
- Krueger R.A., A.M. Casey, 2009. *Focus Groups: A Practical Guide for Applied Research*. London, SAGE Publications.

- L Lascoumes P., 2012: *Action publique et environnement*. Coll. Que sais-je? No. 3968. Paris, Presses universitaires de France (PUF).
- M Mack R.F., 1973: *Criteria for Evaluation of Social Impacts of Flood Management Alternatives*. New York, Institute of Public Administration.
www.edra.org/sites/default/files/publications/EDRA05-v2-Mack-175-195.pdf
- Mastropietro E., 2001: *Rapid Appraisal Method of Social Exclusion and Poverty (RAMSEP project)*. Handbook, Rome, CERFE, European Union.
- Misra V., date unknown: *Social Impact Assessment Methodology*.
- Morris-Oswald M., S.P. Simonovic, 1997: *Assessment of the social impact of flooding for use in flood management in the Red River Basin*. Report prepared for the International Joint Commission Red River Basin Task Force, Winnipeg, Canada
www.ijc.org/rel/pdf/assess.pdf.
- P Program for Displaced Persons, Refugees and Returnees in Central America (PRODERE), 1996: *Les stratégies, les méthodes et les résultats d'un programme pour le développement humain, la paix et la démocratie en Amérique centrale*, Rome, PRODERE.
- R Raaijmakers R., J. Krywkow and A. Van der Veen, 2008: *Flood risk perception and spatial multi-criteria analysis: An exploratory research for hazard mitigation*. Natural Hazards, 46(3): 307–322. Twente.
link.springer.com/article/10.1007%2Fs11069-007-9189-z#page-1
- S Siegrist, M. and H. Gutscher, 2006: *Flooding risks: A comparison of lay people's perceptions and expert's assessments in Switzerland*. Risk Analysis, 26(4): 971–979.
www.ltr.arizona.edu/~coles/Thesis/Readings%20and%20Lit%20review/Siegrist%20and%20Gutscher%202006%20-%20Flooding%20risks%20-%20A%20comparison%20of%20lay%20people's%20perceptions%20and%20expert's%20assessments%20in%20Switzerland.pdf
- U United Nations Environment Programme (UNEP), 2003: *Compendium of Studies of EIA Practice in Developing Countries*, McCabe, M. and B., Sadler, Division of Technology, Industry and Economics, Economics and Trade Branch, Geneva, UNEP.
www.unep.ch/ETb/Publication/compendium/introMat.pdf
- United Nations International Strategy for Disaster Risk Reduction Secretariat (UNISDR), 2009: *Global Assessment Report on Disaster Risk Reduction*. Risk and Poverty in a Changing Climate. Geneva, UNISDR.
www.preventionweb.net/english/hyogo/gar/report/index.php?id=9413
- UNISDR 2009b: *Terminologie pour la prévention des risques de catastrophe*. Stratégie internationale de prévention des catastrophes des Nations Unies (UNISDR). Geneva, Switzerland.
www.unisdr.org/we/inform/publications/7817



- UNISDR 2011: *Global Assessment Report on Disaster Risk Reduction (GAR): Revealing Risk, Redefining Development*. Geneva, UNISDR.
www.prevention.net/english/hyogo/gar/2011/en/home/download.html
- V Vanclay F., 2003: *SIA Principles*. International Principles for Social Impact Assessment. Impact Assessment and Project Appraisal. 21(1): 5-11. Beech Tree Publishing, Surrey, UK.
www.iaia.org/publicdocuments/sections/sia/IAIA-SIA-International-Principles.pdf?AspxAutoDetectCookieSupport=1
- Vanclay F., 2006: *Principles for Social Impact Assessment: A critical comparison between the international and US Documents*. Environmental Impact Assessment Review, 26(1): 3-14. Tasmania, Australia.
www.researchgate.net/publication/222817382_Principles_for_social_impact_assessment_A_critical_comparison_between_the_international_and_US_documents
- W World Bank, 2003: *A User's Guide to Poverty and Social Impact Analysis*. Poverty Reduction Group and Social Development Department. Washington, D.C. World Bank.
siteresources.worldbank.org/INTPSIA/Resources/490023-1121114603600/12685_PSIAUsersGuide_Complete.pdf
- World Bank, 2003b: *Social Analysis Sourcebook: Incorporating Social Dimensions into Bank-Supported Projects*. Social Analysis & Policy Team, Social Development Department. Washington, D.C., World Bank.
siteresources.worldbank.org/INTTSR/Resources/SocialAnalysisSourcebookFINAL2003Dec.pdf
- World Meteorological Organization (WMO), 2006: *Social Aspects and Stakeholder Involvement in Integrated Flood Management*. APFM Technical Document No. 4, Flood Management Policy Series (WMO- No.1008), Associated Programme on Flood Management (APFM), Geneva.
www.floodmanagement.info/?page_id=1797
- WMO, 2007: *Organizing Community Participation for Flood Management*. APFM Technical Document No. 9, Flood Management Tools Series. Associated Programme on Flood Management (APFM), Geneva.
www.floodmanagement.info?page_id=696
- WMO, 2009: *Integrated Flood Management*. Concept Paper (WMO No.1047), Associated Programme on Flood Management (APFM), Geneva.
www.floodmanagement.info/?page_id=281
- WMO, 2011: *The Global Climate 2001-2010 – A Decade of Climate Extremes*. Executive summary (WMO No. 1119). World Meteorological Organization, Geneva.
- WMO, 2013: *Flood Mapping*. APFM Technical Document No. 20, Flood Management Tools, Associated Programme on Flood Management (APFM), Geneva.
www.floodmanagement.info/?page_id=696
- WMO, 2013b: *Risk Sharing in Flood Management*. APFM Technical Document No. 8, Flood Management Tools Series, Associated Programme on Flood Management (APFM), Geneva.
www.floodmanagement.info/?page_id=696

WMO, 2015: *The Role of the Media in Flood Management*, APFM Technical Document, Flood Management Tools Series, Associated Programme on Flood Management (APFM), Geneva.

www.floodmanagement.info/?page_id=696

WMO and UNESCO: *International Glossary of Hydraulics*. WMO No. 385, ISBN 978-92-63-03385-8. Geneva, Switzerland. World Meteorological Organization.

www.wmo.int/pages/prog/hwrp/publications/international_glossary/385_IGH_2012.pdf

FURTHER READING

- A Alinovi, L., E. Mane, and D. Romano, 2001: *Measuring Household Resilience to Food Insecurity: An Application to Palestinian Households*, in *Agricultural Survey Methods* (R. Benedetti, F. Piersimoni, M. Bee and G. Espa eds), Chichester, UK, John Wiley & Sons.

- B Brilly, M. and M. Polic, 2005: *Public Perception of Flood Risks, Flood Forecasting and Mitigation*. Natural Hazards Earth System Sciences, 5(3): 345-355, European Geosciences Union.
www.nat-hazards-earth-syst-sci.net/5/345/2005/nhess-5-345-2005.pdf

- Burge, R.J., 2002: *Why is social impact assessment the orphan of the assessment process? Impact Assessment and Project Appraisal*, 20(1):3–9.
www.tandfonline.com/doi/pdf/10.3152/147154602781766799

- E European Union, 2007: *Directive 2007/60/EC of the European Parliament and the Council on the assessment and management of flood risks*.
eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:288:0027:0034:FR:PDF

- Q Quaranta, G. and G. Quinti, 2005: *Exclusion social et pauvreté – Contribution à la connaissance et à la mesure des risques sociaux et environnementaux dans le contexte international*. Rome, CERFE.

(Unless otherwise noted, all online references were accessed for the last time on 16 June 2015.)

ANNEX I

What is a focus group and how should one be organized?

In this document, we have stressed several times that it would be appropriate, in conjunction with a flood-specific SIA, to promote the organization of focus groups:

- For mapping popular information and environmental and social risks then integrating them with technical information;
- For identifying and assessing potential social risks;
- For jointly developing a plan for monitoring and mitigating impacts.

Below we plan to go deeper into what a focus group is and how to organize one.

I.A What is a focus group?

The concept of a “focus group” originally flowed from the “focalized group interviews” conducted in 1941 by Merton and Lazarsfeld in the field of communication research (Corrai, 2000). In the 1980s, the use of focus groups as instruments for research became increasingly widespread in a social sciences setting.

A “focus group” may be defined as a discussion centred on one or more specific topics and regulated by a moderator, who is tasked with framing the questions or presenting the discussion topics and seeing to it that all are able to express their viewpoints spontaneously, rendering the interaction between participants as productive as possible (Della Ratta-Rinaldi, 2007).

Focus groups are also instruments for facilitating dialogue between persons representing (or characterized by) a plurality of different viewpoints, which serves to build a consensus on one or more specific questions which concern them (Krueger, 2009).

In this perspective, it is useful to apply the CMIC approach.

I.B The CMIC approach

CMIC means “*Coordinated Multilateral and Interactive Consultation*”. It is:

- A **consultation** of a group of people on one or more specific questions which concern them (in our case, for example, on the expansion of flood-prone areas, on the social impacts which have arisen, on the measures to be adopted to counteract these impacts, etc.);
- **Coordinated**, insofar as the discussion/dialogue between this plurality of people is managed by a moderator who, as with any focus group, is tasked with framing questions or presenting the discussion topics, seeing to it that all are able to express their viewpoint, stimulating dialogue, etc.;



- **Multilateral**, insofar as the consultation must imply the broadest possible plurality of different viewpoints (if possible, all of the viewpoints concerned by the questions which are being dealt with) and, in any case, representative of the different social groups/institutions concerned from the community involved in the SIA;
- **Interactive**, in the sense of optimization of the interaction between the participants, each of whom should be able to express himself, also considering the others' viewpoints, as much as possible; the creation of a "favourable environment" characterized by mutual trust and respect and an attempt to build, as far as possible, a consensus on the questions dealt with.

I.C Composition of the focus group

The ideal number of participants should vary between 8 and 12 persons, but it is also possible to promote "mini-groups" of 4-6 persons (Greenbaum, 1998), as well as global groups of up to 15 persons (above this limit, groups are impossible to manage).

In the case of flood-specific social impact assessments, it would be appropriate to organize global groups to facilitate interaction between all or most of the viewpoints concerned. However, given that many of the potential participants are people who tend to have very tight schedules (as a result of which it is difficult to bring all together the same day at the same time), the emphasis will be placed on mini-groups. In order to consult some people who may not be able to participate, it will be necessary to conduct interviews in depth (see below).

Focus groups are normally socially/demographically homogenous groups (for example, young women). This is not our case, where the focus group depends on the interaction of different viewpoints, which means that its composition will have to be as heterogeneous as possible.

It is recommended to form groups of people who do not know each other. If qualified informants and citizens from small local communities are involved, this is virtually impossible. Nevertheless, care should be taken to avoid placing superiors and subordinates or people with personal conflicts in the same group.

I.D Moderation of a focus group

To lead the discussion, it is useful to have an appropriate grid (for example, one which enumerates, inter alia, the different potential impacts identified *prima facie*). Notwithstanding, the grid must be a tool, not a "cage", enabling the moderator to take up other relevant questions as well on the basis of the dialogue established.

Naturally, when preparing this grid, due consideration must be given to the available time and the anticipated number of participants. There is a need to avoid a situation where the focus group only deals with the first part of the questions to be taken up and leaves the others aside, for lack of time.

Questions may be put either using a hierarchical approach (starting with the most senior participants); by following a common thread; or, as is preferable with flood-specific SIAs, by combining the two approaches. It is possible to start by identifying and characterizing the flood,

including the extension of the flooded/flood-prone areas, then put the question of major social impacts or impacts which affect the greatest number of people, and finally move on to less significant impacts.

A focus group generally lasts between 1.5 and 2.5 hours.

It is advisable to structure the focus group into four phases:

- The opening, during which the moderator recalls the purpose of the meeting and the “rules of the game” and participants introduce themselves;
- The introduction, which is set aside for presenting all of the questions which are to be put and giving the general background;
- The substantive phase, during which all of the questions must be dealt with one by one; this part should take up three-quarters of the meeting;
- The conclusion, which is for summing up the meeting, identifying questions which could require further study, and dealing with any supplementary points suggested by the participants.

The focus group must be recorded. In addition, the moderator must be assisted by a secretary who notes down all comments.

I.E The moderator

The moderator must both have experience with managing groups and be very familiar with the arguments dealt with. As far as possible, he must also have charisma, good communication skills, a capacity for flexibility, a “good nature” (be “friendly”), a good memory and sufficient concentration and summing-up skills. He must avoid appearing timid or authoritarian, but must show an interest. If possible, he must also have the ability to decode the participants’ “non-verbal language” (fatigue, desire to speak out, etc.).

The style will have to be a mixture of “dirigisme” (letting everyone speak, but without wandering off track and losing time with pointless details; facilitating a dynamic passage from one question to another; etc.) and “spontaneity”, allowing “unexpected” information, questions and viewpoints to emerge. He will have to limit his comments to his role and not give his views on the questions dealt with.

I.F Absent participants: in-depth interviews

Some of the people who are supposed to participate in a focus group may be absent.

If at least 4-5 persons are present, it would be good to go ahead and hold the focus group, even if it means organizing another group successively or interviewing absent participants one by one.



These interviews should take the form of open, in-depth interviews, to be conducted, *mutatis mutandis*, using the same grid as the focus group and applying rules like the following:

- Avoid a hierarchical relationship between interviewer and interviewee;
- Maintain the distinction between the roles (the interviewer being a facilitator);
- Facilitate empathy;
- The interviewer should avoid influencing the interviewee but at the same time help him to express himself and bring out the information he has (by asking for examples, by recapitulating what the interviewee has already said, by showing an interest, etc.) (Kaufmann, 1996).

ANNEX II

Model grid for conducting focus groups within the framework of a flood-specific SIA

NB 1: *The model is shown purely as an example and must be adapted to the situation and specific locality where it will be used.*

NB 2: *This instrument is not exhaustive and contains examples of questions to be put. Some questions are relatively developed, while others must/may be developed in a more analytical fashion. Further questions must/may be added. Others have to be modified/eliminated.*

CODE: _/_/_/_/_/_			
Town/village:		Commune/neighborhood:	
District:		Borough:	
Department:		Province:	
Focus group moderator:		Focus group secretary:	
Date:		Length:	
Participants in the Focus group			
Occupation or activity/Reference entity (on the basis of which they are participating in the focus group)			
A. Characteristics of the population (of the focus group's reference area)			
Total population	N.	No. of women	N.
No. of families/ Households	N.	No. of children (0-9 yrs)	N.
No. of men	N.	Population (50 and over)	N.



B. Characteristics of the Territory (of the focus group's reference area)			
Distance from the provincial capital	km:		
Distance from the nearest town	km:	Name of town:	
The road leading there is paved °	Yes	No	Partly °°
Current status of the road °	Good	Passable	Poor °°
Predominant activity sectors of the population (as a %)	Agric. Rearing	Crafts Industry	Services Small Commerce
° If relevant °° Delete as appropriate			

C. Territorial and historical characteristics of floods (in the focus group's reference area)			
Date of the last flood recorded			
Year of the flood in which, according to the participants' memory, the most damage was recorded			
Are floods in the area considered periodic/seasonal?	Yes	No	Partly
Relative to rise time, floods in the area are considered:	Flash	Rapid	Slow
Location of the flood-prone area of the last flood according to participants (list the localities involved; specify the territory involved, etc.) °			
Maximum extension of the flood-prone area according to participants (list the localities involved; specify the territory involved, etc.) °			
Other important characteristics of the flood-prone area according to participants			
° These questions should be put using a map of the focus group's area of competence; participants should reach a consensus on flood-prone areas			

D. Social impacts					
D.1 Individual and family					
	none	low	medium	high	annotations
Reduced availability of food and an adequate diet	°	•	••	•••	
Reduced mental health, increased stress, anxiety, alienation, apathy, depression	°	•	••	•••	
Personal security status	°	•	••	•••	
Decline in the perceived quality of life	°	•	••	•••	
Decline in living standards or level of affluence	°	•	••	•••	

D. Social impacts					
Worsening of the economic situation, drop in the value of property income	◦	•	••	•••	
Decrease in autonomy, independence, security and livelihood	◦	•	••	•••	
Disruption of everyday life, lifestyle (changing habits)	◦	•	••	•••	
Reduction in the value of environmental commodities	◦	•	••	•••	
Perception of the community, community cohesion, integration	◦	•	••	•••	
Community's identification and relationship with the place (belonging)	◦	•	••	•••	
Change in attitude towards the local community, level of satisfaction with the neighbourhood	◦	•	••	•••	
Disruption of social networks	◦	•	••	•••	
Modified perceptions of personal health and security, risk, fear of crime	◦	•	••	•••	
Modified leisure opportunities	◦	•	••	•••	
Housing quality	◦	•	••	•••	
Impact on the homeless	◦	•	••	•••	
Workload, amount of work required to survive/live decently	◦	•	••	•••	
Other impacts on this level (specify)	◦	•	••	•••	
Other impacts on this level (specify)	◦	•	••	•••	
D.2 Community and institutions					
	none	low	medium	high	annotations
Death of people in the community	◦	•	••	•••	
Adequacy of the physical infrastructure in the community (water supply, sewers, services and commodities)	◦	•	••	•••	
Adequacy of the community's social infrastructure, of health, well-being, education, libraries, etc.)	◦	•	••	•••	
Adequacy of housing in the community	◦	•	••	•••	
Workload for institutions, local authorities, regulatory bodies	◦	•	••	•••	



D. Social impacts					
Cultural integrity (maintenance of local culture, tradition, rites)	◦	•	••	•••	
Resource rights and access	◦	•	••	•••	
Influence on cultural heritage and other major archaeological, cultural or historical sites	◦	•	••	•••	
Changes in equity/social justice issues concerning minority or indigenous groups	◦	•	••	•••	
Economic prosperity	◦	•	••	•••	
Dependence/autonomy/diversity/viability of the community	◦	•	••	•••	
Opportunity cost (loss of other options)	◦	•	••	•••	
Real crime	◦	•	••	•••	
Real violence	◦	•	••	•••	
Social tensions, conflicts or serious divisions within the community	◦	•	••	•••	
Corruption, credibility and integrity of the government	◦	•	••	•••	
Level of community participation in decision-making	◦	•	••	•••	
Social values of heritage and biodiversity	◦	•	••	•••	
Other impacts on this level (specify)	◦	•	••	•••	
Other impacts on this level (specify)	◦	•	••	•••	
D.3 Other social impacts					
	none	low	medium	high	annotations
Other impacts on this level (specify)	◦	•	••	•••	
Other impacts on this level (specify)	◦	•	••	•••	
Other impacts on this level (specify)	◦	•	••	•••	
Other impacts on this level (specify)	◦	•	••	•••	

E. Poverty					
Can you indicate approximately how many of the community's inhabitants are extremely poor? (minimum income below..... per person in a given family).					v.a. %
Can you indicate which of the following groups have been hardest hit by poverty in this community?	Elderly °	Women °	Disabled °	Unemployed °	Other (specify) _____
Can you indicate how previous floods impacted the poorest groups in the community? _____ _____					
In the community, how many families do not have permanent housing or live in makeshift housing?					v.a. %
In the community, how many families do not eat at least twice a day?					v.a. %
In the community, how many families have no form of financial income?					v.a. %
Can you indicate what resources these people can count on to live? _____ _____					
Can you say whether these people are in contact with their families, the community inhabitants or their neighbours?			Almost all maintain contact°	In many cases they lose contact°	They almost always lose contact°
Can you tell us whether these people are active in groups or local associations?			Frequently°	Sometimes°	Never°
Can you tell us whether these people participate in flood prevention and management initiatives?			Frequently°	Sometimes°	Never°

F. Civil Society					
The community has:	Yes	No	No.	Are they developing activities or flood prevention, management, reconstruction, etc. activities in relation to floods?	What is the intensity of their activities in this field? °°
Community/village/ neighbourhood development committee	°	°		Yes No	1 2 3 4 5
National or local NGOs	°	°		Yes No	1 2 3 4 5
International NGOs	°	°		Yes No	1 2 3 4 5



F. Civil Society						
Development projects	°	°		Yes	No	1 2 3 4 5
Community self-help and micro-credit groups	°	°		Yes	No	1 2 3 4 5
Artistic, cultural, musical and sports groups	°	°		Yes	No	1 2 3 4 5
Churches and religious congregations	°	°		Yes	No	1 2 3 4 5
Cooperatives or associations of farmers or breeders	°	°		Yes	No	1 2 3 4 5
Women's associations	°	°		Yes	No	1 2 3 4 5
Protection and aid associations for groups (elderly, disabled, etc.)	°	°		Yes	No	1 2 3 4 5
Trade unions and political parties	°	°		Yes	No	1 2 3 4 5
Local public administrations	°	°		Yes	No	1 2 3 4 5
Other (above all CIG-EIG, specify) _____ _____	°	°		Yes	No	1 2 3 4 5
°° indicate: 1 permanent; 2 regular; 3 periodically even beyond emergencies; 4 only on the occasion of a disaster; 5 exceptional						

What are the main activities and projects implemented by these bodies in relation to floods?	
Village community development committee/ neighbourhood committee	
National or local NGOs	
International NGOs	
Development projects	
Community mutual aid and micro-credit groups	
Artistic, cultural, musical and sports groups	
Churches and religious congregations	
Cooperatives or associations of farmers or breeders	

What are the main activities and projects implemented by these bodies in relation to floods?	
Women's associations	
Protection and aid groups (elderly, etc.)	
Trade unions and political parties	
Local public administrations	
Other (above all CIG-EIG, specify) _____	

G. Social action				
Is the community population currently participating via materials or labour in flood prevention and management initiatives?	To a broad extent	To an average extent	To a limited extent	No plans to do so
In this community, is it customary to help a relative or neighbour when he has to repair damage?	To a broad extent	To an average extent	To a limited extent	There have not been any cases

H. Subsequent comments

For more information, please contact:



Associated Programme on Flood Management

c/o Climate and Water Department
World Meteorological Organization

tel +41 (0) 22 730 83 58
fax +41 (0) 22 730 80 43
email apfm@wmo.int
www.floodmanagement.info



**World
Meteorological
Organization**
Weather · Climate · Water

World Meteorological Organization

Communications and Public Affairs Office
7 bis, Avenue de la Paix – P.O. Box 2300
CH-1211 Geneva 2 – Switzerland

tel +41 (0) 22 730 83 14/15
fax +41 (0) 22 730 80 27
email cpa@wmo.int
www.wmo.int



GWP Global Secretariat

Linnégatan 87D - PO Box 24177
SE-104 51 Stockholm – Sweden

tél +46 8 1213 86 00
fax +46 8 1213 86 04
email gwp@gwp.org
www.gwp.org

