
**HIGHER GROUND: AN ANALYSIS OF THE RANGE OF POTENTIAL
INSTRUMENTS FOR EFFECTIVE RESETTLEMENT IN FLOOD-PRONE AREAS**

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In co-operation with

Ecologic, Institute for International and European Environmental Policy

PREFACE

During their spring term 2006, four students enrolled in Tools of Environmental Management at the Hertie School of Governance looked for a mock client willing to ask for their services in providing environmental policy solutions. Ecologic, Institute for International and European Environmental Policy, located in Berlin, took on the challenge and ordered from the students a study which was to consider means to engage in adaptation and resettlement in flood-prone areas. The students immediately took to the problem at hand, as they recognized its critical salience following disasters such as Hurricane Katrina, which had devastated New Orleans just months prior to the student project.

The vulnerability of human settlements to floods has become evident from regular catastrophic events around the world, most recently in the flooding of Jakarta. If augmented by heavy rainfall, snowmelt or storm surges, the water can rapidly turn from blessing to threat, and floods may endanger lives and cause displacement and suffering. Damage assets that have been assembled over long periods of time show that these events cause major economic losses footed by the public as well as the private sector. Climate change is expected to raise the frequency and intensity of such events in the future, and to induce sea level rise adding to pressures in coastal areas. Yet, human livelihoods and economic activities continue to be systematically drawn to flood-prone areas near rivers, lakes and the coast, as they seek and depend on the water's economic potential for transportation, irrigation, resource exploitation, and leisure.

The vulnerability of European societies to floods was illustrated by the catastrophic floods along the Danube and Elbe rivers in 2002 and the severe floods in 2005 and 2006. By all accounts, climate change may affect wide areas of Europe, from the mountainous areas along the Alps, via the watersheds along densely populated river basins throughout Europe, all the way to the coastal areas of countries such as the Netherlands or Denmark. This is why flooding is a salient issue in water policy and related policy areas of the European Union, such as coastal zone management. The upcoming EU Floods Directive recognises the increased threat from climate change and aims to improve instruments for managing flood risk.

While climate change policies are considered around the world and technologies to predict floods and protect flood-prone areas from catastrophic damage are constantly perfected, there is also a growing need to consider receding from flood-prone areas. In certain circumstances, it may be the most sustainable solution to remove private property and

critical infrastructure from damage prone areas. With this premise in mind, **what are possible instruments to achieve resettlement?** This is how the students phrased the core question of their study on behalf of Ecologic. They decided to focus on river basins, as these are often areas in which the multifaceted interests to stay put are strongest.

In line with the aim of the attended course, the students took what policy analysts like to call an “instruments approach”. In sum, this approach conceives public policies as a set of instruments aimed at achieving certain stated goals, i.e. the resettlement of communities away from flood prone areas. The students purposefully considered the broadest range of instruments possible, ranging from persuasion to mandatory government action. Also in the interest of analytic breadth, they considered the adoption of new tools as well as the removal of disincentives in place. With the breadth of policy instruments discussed in the literature in mind, they first compiled a set of resettlement cases, which can be found in condensed form at the end of this report. They then examined these cases in light of the policy instruments literature in order to draw lessons applicable to the resettlement problem at hand. The report is organized along types of instruments by referring to and drawing from these cases.

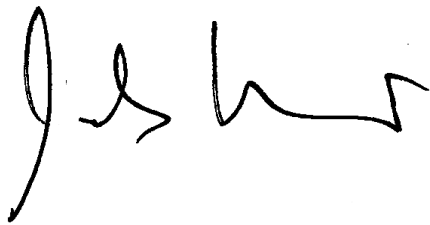
The present report is the result of a co-operation between the Hertie School of Governance and Ecologic. The report was written by the students, who contributed to it in equal amounts. Hertie School of Governance professor Sonja Wälti provided theoretical guidance and supervised their work. The report’s content and drafting benefited greatly from the input and guidance provided by Ecologic. R. Andreas Kraemer, Ecologic’s managing director, instructed the students in the expectations a client has towards such a study and generously let the students use material gathered by Ecologic. Anna Leipprand and Thomas Dworak, fellows with Ecologic, supported the students’ endeavour discussing with them intermediary results and by keeping them on track.

The project thus combines Ecologic’s expertise from more than ten years of project and consultancy work in the field of water and flood risk management with the interest of the Hertie School of Governance’s MPP in instructing its students about aspects of environmental governance. Ecologic thus provided the students of the Hertie School of Governance the necessary setting and framing of the problems that has given them insights into the work of an environmental policy consultancy. Thanks to the high motivation and abilities of the students, the results of this cooperation are highly presentable.

The report provides a well-written, well-structured and balanced discussion of the issue of resettlement, as well as a comprehensive list of potential instruments that policy makers can

consider to encourage and achieve resettlement where needed. The report will hopefully prove to be a valuable resource for our work and that of others on related issues in the future, and thus make an important contribution to the current debate about climate change and flood risk increase.

We wish the authors of this report all the best in their future careers!

A handwritten signature in black ink, appearing to read 'J. Kraemer', with a stylized, flowing script.

R. Andreas Kraemer

Director

Ecologic – Institute for International
and European Environmental Policy

A handwritten signature in black ink, appearing to read 'Sonja Wälti', with a large, elegant loop at the beginning.

Sonja Wälti

Professor of Public Policy and Public Administration

Hertie School of Governance

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EXECUTIVE SUMMARY

This report investigates the range of instruments that can be utilized in achieving resettlement. It report begins with the assumption that the process of global climate change will inevitably require the resettlement of various communities worldwide. Since there has been little written on the options that policy-makers have in choosing effective instruments, this report attempts to fill part of this gap. While not exhaustive, the broadest range of instruments possible has been identified—from command-and-control to the provision of public information.

The target audience for this publication includes those who are or could be actors in the decision-making process when the issue of resettlement finds space on the public agenda. While its main focus is on the theoretical range of instruments that can be used to achieve resettlement, every attempt has been made to include a broad range of practical cases from around the world. Therefore, while the report should be substantive in its content, it should also be accessible to a wide range of individuals and organizations.

The report starts with a definition of the problem. Therefore, Chapter 1 will be useful for those who need an introduction to the topic itself, as well as to the context within which the report was written. Chapter 2 provides a description and discussion concerning the range of actors and stakeholders that are involved in processes of resettlement. Included are a diverse group of governmental institutions, private organizations, professional associations, and community interests. Thus, an attempt was made to include all potential actors and stakeholders from the public, private, and civil society sectors. This discussion may be useful for those developing a strategic plan for policy development to consider groups that may have similar or opposing interests.

The bulk of the report is dedicated to the range of instruments that are available to policy-makers. In order to systematically categorize these instruments, the typology from Howlett and Ramesh (2003) has been utilized. Therefore, instruments have been grouped into those that are organizational, informational, authoritarian, or financially-based. Descriptions and examples of potential—and sometimes often-utilized—instruments are included in each of the four sections of this chapter.

After outlining the range of potential instruments in Chapter 3, the following chapter provides a comparative assessment of these instruments. Overall, it is suggested that

instruments of the treasury and of authority can be seen as very effective in achieving the goals that policy-makers develop. However, there are other assessment criteria that make them less attractive based on either their levels of coercion or their sheer cost. Some non-traditional instruments, however, such as the removal of hidden subsidies, can actually be both highly effective and highly efficient in achieving resettlement goals. It is recognized that every community and region will face its own challenging situation. Therefore, there is no one policy proposal for all settings; rather, readers can use this section as a guide as a tool to assist in making decisions concerning instrument choice.

The report concludes with some overall findings and recommendations. One particular proposal, for example, would be to avoid single-instrument approaches. Often times, some instruments seem to function the most effectively and efficiently when used in combination with other instruments. Financially-oriented instruments, for example, might be rather ineffective on their own but be a great success when coupled with the right awareness-raising campaign. For this reason, there should be a range of instruments in different categories considered. This, indeed, allows for the broad engagement of actors and stakeholders in creative constellations. Overall, instrument-choice outputs should often include a variety of instruments, and a diversity of voices in the decision-making process is highly recommended.

Finally, there must be a willingness for creativity and innovation in order to achieve future goals of resettlement. Therefore, examples must be drawn out of other sectors. For instance, quite unorthodox models of ‘resettlement’ can be found that concern population displacement due to circumstances having nothing to do with natural disasters. Examples are urban development and international political tension. There are countless examples around the globe of people being displaced from one location to another. While some situations would be unacceptable due to their abuse of human rights, this is not the case for all of them. In these cases, the instruments used to achieve relocation should be viewed and considered by policy-makers when attempting to develop resettlement strategies in their own communities and regions. Some of these very cases have been included—all of which can be found in the annex included at the back of the report—and more should be sought in detail in order to broaden the range of available options. Through creativity, positive resettlement solutions can be found.

1. INTRODUCTION

The purpose of this report is to serve as a guide for the broad range of actors and stakeholders in the policy-making process. This report begins with the assumption that the process of global climate change will eventually require the resettlement of some sections of the human population. It investigates the range of instruments that could be used in achieving resettlement, it provides a comparative assessment of these instruments, and it attempts to assist policy-makers in the process of instrument choice.

1.1 *The Problem*

Disastrous storms, loss of biodiversity, elevated sea levels, desertification or growing health risks are just a few examples of the irreversible impacts of climate change. As global temperature rises the water-absorbing capacity of the atmosphere increases, resulting in less frequent but heavier precipitation. For some this phenomenon means less water, loss of crops and disappearing vegetation. However, others face repetitive and more torrential storms and increasing risk of flooding. It is interesting to see that while the attitude of “Not in My Backyard” has developed concerning nuclear power plants, chemical-waste dumps or even airports, people seem not to worry about living in the proximity of regularly flooding rivers. Although technology, and consequently, warning systems and building techniques have rapidly progressed in the past sixty years, we see ever increasing costs associated with floods.

Table 1: Great Flood Disasters¹

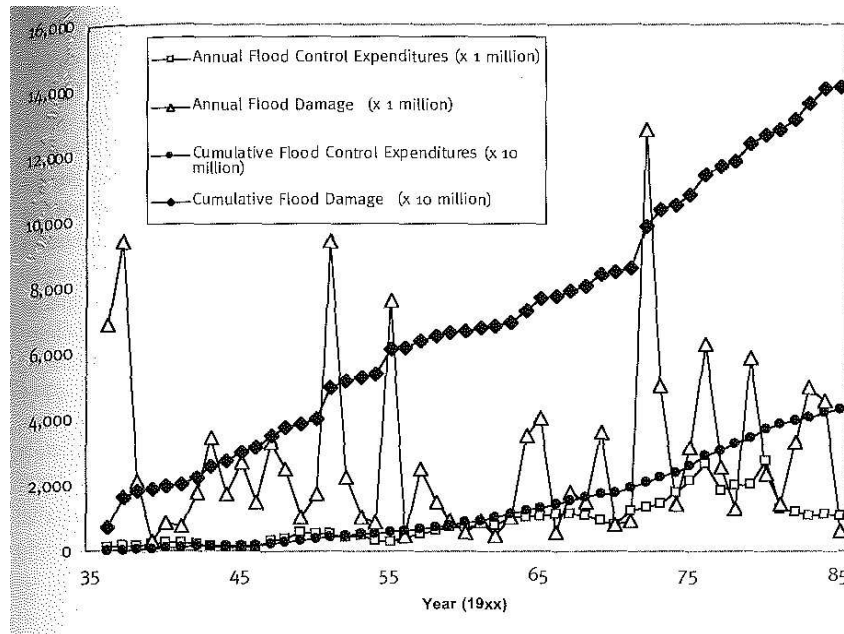
	1950-9	1960-9	1970-9	1980-9	1989-98
No. of events	7	7	9	20	34
Losses (US\$ bn, adjusted for inflation)	27.9	20.2	19.2	25.5	199.6

This can be explained by the idea that as technological advances and corresponding infrastructure make more places habitable, fortify those settlements and gets them to believe that they are safe, the natural fear of floods disappears from people’s minds. That false feeling of security leads to the irrational density of settlements and accumulation of wealth in highly flood-prone areas. With the passing of time when an unavoidable flood actually

¹ Hunt (2004), p. 134

makes its way to the people, formidable losses occur, both concerning lives and property. This is well illustrated in the following chart:

Figure 1: Flood Control Expenditures and Damage (in US dollars)²



Faced with this, what can governments do to avoid increased damage and to mitigate risks?

There are different approaches they can take to adapt to the new situation *caused* by climate change but *enhanced* by foolish human beliefs about our abilities to control nature with the help of technology. The following strategies were developed by the Canadian government's Climate Change Impact and Adaptation Program, and are organized in the following table according to increasing involvement in the process.

Table 1: Adaptive strategies³

CATEGORY	EXPLANATION	EXAMPLE
Bear the costs	Do nothing to reduce vulnerability and absorb losses	Live with recurring flood events
Prevent the loss	Adopt measures to reduce vulnerability	Elevate dikes, levees and other barriers to the river
Spread or share the loss	Spread burden of losses across different systems or populations	Institutionalize natural hazard/flood insurance
Change the activity	Stop activities that are not sustainable under the new climate, and substitute with other activities	Adapt housing, for example with amphibious houses
Change the location	Move the activity or system	Relocate vulnerable communities

² Hunt (2004), p. 137.

³ From Climate Change Impacts and Adaptation: A Canadian Perspective.

Enhance adaptive capacity	Enhance the resiliency of the system to improve its ability to deal with stress	Restore floodplains
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As a precautionary measure for minimizing possible future costs and damages, the last two strategies are the most effective. This report is about the issue of resettlement, or relocation of communities living in increasingly flood-prone areas.

1.2 The Context of this Study

This report is being written as a term paper at the Hertie School of Governance in Berlin within the framework of a course on “Instruments of Environmental Governance”, and under the guidance of “Ecologic”, the Berlin based Institute for International and European Environmental Policy. In the wake of recent government reforms, the choice of policy tools at disposal of policy-makers has been extended from direct service and good delivery to the more indirect regulatory, financial and informational tool categories.⁴ Each tool has different operating procedures, skill requirements and delivery mechanisms, and affects different stakeholders in various ways. The choice of the best adapted instrument by the policy-makers is therefore not an easy decision and needs a careful analysis.

This study is hypothetically addressed to a European river basin organization. They are very specialized in flood protection and resistance, but have only little experience with permanent relocation. This might change with the expected increase in frequency and violence of floods induced by climate change. Some areas that were safe during the last century can evolve into flood prone areas. In this study, we look at any potentially necessary resettlement case in a European river flood plain due to more frequent and violent floods, as they are expected due to climate change. What could a European river basin organization answer to a government looking for advice on how to proceed with a situation of flood relocation necessity?

There are different ecological areas immediately affected by climate change in Europe. To name a few: the expected rise of sea-level will change the coastlines, the melting of permafrost and glaciers will threaten biodiversity and induce mudslides in mountainous areas and the increased precipitation will result in more frequent and more violent flood events in river floodplains. We concentrate only on floodplains, and then look at the potential for generalization to the others in Chapter 5.3. River floods are flooded punctually for a rather short period. The rest of the time, river plain land is very valuable for

agricultural means and other activities. Coastal areas tend to be flooded punctually by high tides and storms and permanently when the sea-level rises. Punctual floods however are difficult to foresee. The question whether to resettle or not is much more complicated in river plains than on coastal areas, where there are less economic trade-offs involved. Compared to mountain areas too, river floodplains tend to represent more value: they are more densely populated and the agricultural potential is much greater. This is why the river floods represent a much greater potential for damage than mountain floods.

We chose Europe because it has less experience with relocation than other continents. A second reason is that Europe is composed of well-established democratic states in which top-down decision-making for this kind of problem is not anymore conceivable. Participatory processes seem more logical and unavoidable, but have rarely been used yet for resettlement decisions in a European environment. An example is the Dutch Overdiepse Polder Case, where the local community took the initiative for its own resettlement.⁵ Europe is special furthermore because of its very dense use of its territory. In certain areas, wealth has been accumulated over several centuries, and bears high economic, historic, symbolic or emotional value. This makes any decision-making on resettlement in Europe a quite complex task which has to be conducted with much sensitivity and ability.

1.3 The Method

The assumption that resettlement is the only reasonable option in a certain floodplain area is our starting point. In order to facilitate the decision making process and help avoid the “garbage can approach” we attempt to gather all possible instruments at the disposal of governments, and evaluate them according to their pros and cons in different phases: their probability to pass the decision-making procedure, their delivery and their effect on the policy recipients. Illustrative case files are presented in order to match theory and empirical experience. They are listed in the Annex.

Before starting with the analysis of the instruments in Chapter 3, an introduction to the main actors and stakeholder involved follows in the next chapter. The different instruments are compared in the fourth chapter.

⁴ Salamon L.M. (2002), p..2

⁵ see Case file Number : 14

2. DISCUSSION OF ACTORS AND STAKEHOLDERS

In order to proceed with this report, there must be an understanding of the actors and stakeholders that are involved in the potential policy sub-system. This is important for readers to keep in mind, because some stakeholders, for example, might be missed in organizing participative planning efforts. If all actors and stakeholders are vested in the pursuit of resettlement, the feasibility of any implementation effort will be increased.

There is a large constellation of actors and stakeholders that are involved in the policy areas concerning the issue of resettlement. First, there is a large variety of organizations and individuals who are involved in environmental protection, many of which are interested in limiting the negative effects of flooding. Other groups are interested in the freedom of individuals and firms to make their own decisions in all cases without the interference of regulations. Still others are interested in the protection of wild animals, the planning of strong communities, the protection of vulnerable populations, and the promotion of countless other goals.

A further division can be drawn between the types of players in this process, whether they are actors, stakeholders, or a combination of both. Actors are generally considered to be active participants and decision makers in policy development processes, while stakeholders are those who are specifically affected, either positively or negatively, by events and policies, although they are not necessarily active participants in the process of finding solutions. In order to explore the wide range of actors and stakeholders that can be included in the process of planning resettlement, these individuals and groups will be divided into three groups: the governmental, non-governmental, and private sectors. Each sector will be discussed in turn.

2.1 Governmental Sector

Concerning the topic of resettlement, there are a variety of governmental levels that could be involved. First, there can be supranational governmental organizations. In the case of many European countries, the European Union has become a major actor in many areas of policy development. If there were enough pressure from individual member countries or from supranational interest groups, the development of European, supranational policy

encouraging resettlement, even if using only the most non-intrusive of instruments, could be conceivable.

National governments are the next level. It could be argued that this is the level that can have the broadest impact upon resettlement efforts. By developing resettlement policies, whole river basins could achieve a unified set of policy instruments to achieve overarching resettlement goals. Of course, there can also be a variety of actors within national governments. For example, there are perhaps ministries and agencies within the national executive, both of which have their own organizational cultures and path dependencies. For example, the path dependency of an emergency management agency would be somewhat different from that of a ministry for environmental affairs. This makes national governments everything but a homogenous actor in this process.

State and regional governments can also be actors. Depending on the country, one, both, or none of these levels may exist or actually be a significant player. Particularly where regional governments are formed along environmental boundaries, such as defining watersheds or river basins, these organizations can potentially be a strong actor in making change to regional-level policy. Furthermore, their potential for interconnectivity with other organizations can make them much more effective in dealing with local governments and various non-governmental organizations.

Finally, local governments can also be important actors in the policy-making process. Even if upper levels of government are unwilling or reluctant to take a leading role in promoting resettlement, municipalities have a role to play. While they may lack a large amount of financial resources available to other levels, municipalities are, nevertheless, the closest to local populations, and they often have various competencies over long-range planning and the decisions concerning land use. In this way, local government can become an important complement to or even a replacement of action from upper levels of government.

2.2 Private Sector

The second group of actors and stakeholders in this area of policy development is the private sector. Whether on the whole or individually, private interests will likely want to be a part of the process of developing policy responses, and including these actors can improve public acceptance of the overall output.

There are certainly a variety of business interests that will promote specific stances in developing policy on resettlement. On the aggregate level, there can be business or trade associations that have specific preferences about the choice of instruments. For example, some private actors will prefer the use of market-based instruments over the standard type of command-and-control regulation. On the micro-level, however, there will certainly be individual business owners that will have a direct interest in the policy output—perhaps because it will affect their enterprise directly.

Particularly in the context of river basins, there are several actors or stakeholders that must be mentioned. First, members of the agricultural community will have an interest in any policy-development process. They often own or utilize land near or adjacent to rivers and will, therefore, often be affected by flooding or any policy affecting land-use of flood plains. Next, there are water-based enterprises, such as fishing and navigation businesses. Although their primary interest is the river that provides their livelihood, issues of land-use and general regulation of waterways will be of great importance to them, and they can be active players in the policy sub-system. Finally, the leisure and tourism industry will inevitably have a stake in the changes in policy along waterways, as these areas are often one focus of their services. Making sure that these specific actors and stakeholders are informed and involved might be challenging, but it is important for the overall policy process.

Finally, a few other specific private-sector groups must be mentioned. Additional entities that may have a particular interest in participating in policy processes could be insurance companies, real estate companies, and the construction industry. These two areas of the private sector could potentially gain or lose a great deal depending upon the policy responses created to the need for resettlement. While there are many other private interests that can exist, these are some of the most widely known and involved actors.

2.3 Non-Governmental Sector

Along with government and the private sector, the non-governmental sector must also be included in the discussion of actors and stakeholders. One of the most significant actors in the non-governmental sector can be issue-based organizations. For example, many organizations exist to pursue various goals. The goal can be very broad, such as environmental protection, or it can be quite narrow, such as protection of the ability of salmon to migrate upstream to spawn. Furthermore, these actors can be more involved in influencing policy, as many interest groups are, or they can be a loosely organized group that

only provides information on the local level. In any case, the range of non-governmental, issue-based organizations can be incredibly broad. It should be clear that these groups can be very diverse and have variety of overlapping (or mutually exclusive) policy cores.

One issue-based organization that is worth mentioning here is, however, the community-based organization. Although these organizations usually deal with other types of issues, such as community betterment, they might provide a social network necessary to represent neighborhoods that are vulnerable to the effects of flooding. Such organizations might be actors in such a process, or they might merely be civic or religious organizations that are inactive, but large stakeholders in such decision-making processes. Bringing these organizations into direct participation, particularly if they are inactive stakeholders, is very important, because it will help to ensure that average, individual citizens are included in the process. This not only helps to achieve a broad base of support as plans are developed, but it also helps to ensure that as many interests as possible are represented, and that implementation of any plans will be more successful.

Another type of organization will inevitably seek participation based on their professional focus: groups such as the associations of flood plain engineers and floodplain managers are also important stakeholders. These groups can reinforce path dependencies by preferring particular structural approaches to floodplain management. Hence, they act as veto players in the floodplain policy subsystem.

Not to be forgotten are political parties. These groups are, by definition, actors in the policy-making process. Path dependencies will also be an important consideration in collaborating with parties. They typically have a particular preference in instrument choice, be it a more laissez-faire, market-based approach, or a more centralized, regulatory approach. Since they inevitably acquire a large amount of attention from the media, and thus influence over public opinion, it is important to include these parties in the process from the beginning.

A final type of non-governmental organization is the media itself. While some debate whether media is an actor or a stakeholder, it certainly is involved in the process of developing policy. Since media is often the primary source of information for groups and individuals in society, its ability to choose whether to provide various pieces of information or not gives it inevitable power. For example, left-leaning media may be more likely to report on the problems of flooding and the reasons in support of resettlement, while right-leaning media might focus information on the need for individual rights, or it might ignore the topic altogether, preventing the public from being informed about the issue. In

summary, media can play a role, and it should be considered as either an actor or a stakeholder in the policy development process.

3. THE RANGE OF INSTRUMENTS AND POLICIES

As mentioned earlier, this report attempts to assist its reader in the process of instrument choice when the decision has been taken to pursue resettlement. In this section, instruments will be identified and described according to the way in which they can be used to achieve resettlement. In some cases, the instruments have already been utilized and have proven to be useful. In other cases, the instruments may be untested, at least in regard to the problem of global climate change and the need for resettlement. In as many cases as possible, examples of real-life measures have been included. Furthermore, when these actual examples have been provided, a corresponding case file has been made available in the appendix for the reader who desires more information.

In order to organize the types of instruments available, the taxonomy of instruments from Howlett and Ramesh (See Sources) has been utilized. In this classification, instruments are divided into the following categories: organization, authority, treasury, and nodality. Each of these categories is briefly described in Figure 2 and will be further developed in the coming sections.

Figure 2: Classification of Instruments⁶

Organization: Such instruments involve the direct provision of goods and services, the use of community and voluntary organizations, the creation of markets, and the reorganization of government.

Authority: These instruments involve regulation by the government in the shape of permits, bans or standard-setting by legislation.

Treasury: Instruments of the treasury involve the power of government to raise and distribute funds.

Nodality: Such instruments involve the distribution of information, advice, and advertising, as well as the use of commissions and inquiries.

Furthermore, in order to assist in understanding the merits and inherent weakness of each of these instrument groups, they will be described according to the following dimensions:

their level of coerciveness, directness, automaticity, and visibility.⁷ Each of these dimensions are briefly described in Figure 3.

Figure 3: Dimension of Instrument Classification⁸

Coerciveness: This dimension measures the extent to which an instrument dictates certain decisions or behaviors. A non-coercive instrument would merely encourage or discourage certain behaviors.

Directness: This measure illustrates the extent to which all administrative activities—planning, funding, and implementing—take place within the same entity.

Automaticity: This measures the extent to which an instrument utilizes the structures that are already in place within government or other organizations. Non-automatic instruments require the formation of a new organization or unit.

Visibility: This dimension measures the tendency of an instrument to be clearly shown in government or organizational budgeting and review.

These dimensions are useful for understanding the nature of the instruments, their implementation capacity as well as their selection.⁹ When choosing a policy tool, decision-makers consider not only the inherent characteristics of the instruments, but also their political consequences. These can be very significant and explain why choices are not always rational when analyzed on the effectiveness and efficiency scale.

Just to mention a few examples, a policy benefiting to a small minority might be attributed a rather invisible tool. Indirect tools can attract support from provider groups but make the implementation less manageable. Automatic instruments can save administrative costs and are less visible. Coercive instruments are more likely to hassle harsh resistance from interest groups during the decision making process.

With these categories and dimensions in mind, the range of instruments that are available will now be investigated.

⁶ Howlett and Ramesh (2003), Chapter 4

⁷ Salamon (2002), p.24

⁸ Salamon (2002), p. 24-37.

⁹ Peters B.G. in Salamon (2002), p.552

3.1 Instruments of Organization

The first group of instruments, those that are organization-based, rely on the direct use of personnel and organizational resources of a variety of entities: governments, public agencies, and non-governmental, community, voluntary, family, and market organizations. They are the oldest and the most widely used policy instruments to deliver relief services in times of emergency or crisis. Organization-based instruments tend to fall into two main types: “substantive instruments, designed to deliver or affect the delivery of goods and services and procedural instruments, used to alter policy processes in such a way that governments can retain their legitimacy or capacity to act”¹⁰.

Organizational instruments can be classified in a variety of ways. Due to their direct involvement in the delivery of resettlement or relocation services, they are the less coercive than some other policy instruments. Nonetheless, within this class, the degree of coerciveness varies from direct government provisions to voluntary-based organizations. These instruments have a lower degree of automaticity, since they often involve the creation of new administrative structures, programs, agencies or corporations. Finally, they have an inherent physical visibility. The mobilization of personnel and organizational resources is generally quite visible to the public and, hence, enhances their political viability¹¹.

Organization-based instruments have a variety of merits. First, the high degree of directness of organization-based instruments lowers transaction costs, which makes them easier to establish. For instance, governments’ direct provision of relocation services reduces the information costs that are involved in the use of third parties. The large size of some agencies and organizations enable them to benefit from economies of scale. For example, the US’s Federal Emergency Management Agency’s (FEMA) size allows it to mobilize human resources to engage in large-scale relief operations. Due their low level of coerciveness, organization-based instruments benefit from regulatory simplicity. They are also often consistent with established cultural norms. For instance, governments’ provision of disaster relief fits with their traditional duty of providing welfare to citizens. Furthermore, their low automaticity gives them flexibility and speed, as well as opportunity for experimentation. For instance, FEMA has reserved 15 percent of its portfolio for the

¹⁰ Howlett M. and M Ramesh (2003), p.91

¹¹ Salamon LM. (2002), p.12

provision of relocation and resettlement services. Finally, because of their high visibility, organization-based instruments have a high degree of political acceptability.

The weaknesses of organization-based instruments are, however, no less significant. First, due to their large size and absence of competition, delivery programs run by agencies are often inflexible and inefficient. Second, their high degree of directness makes them vulnerable to political interference and conflicts. For example, the choice of particular tools or delivery mechanisms that agencies select in addressing flooding is vulnerable to political manipulation. Finally, organizations may develop a life of their own, drifting or persisting beyond their original mission. These weaknesses should be considered when contemplating creation or alteration of organization-based instruments. With these points in mind, specific examples can now be provided.

3.1.1 Direct Government Provision

Direct government provision is the traditional instrument utilized by governments. Instead of waiting for private or non-governmental organizations to react in times of emergency, governments often employ their own personnel resources to directly provide relief services. Governments may utilize existing agencies to precipitate resettlement of businesses and peoples from potential flooded areas. For example, the United States National Army Corps of Engineers (USNACE), under the flood plain management program, provides planning assistance on flood and flood plain management issues including permanent evacuation and relocation services¹². The personnel of FEMA also undertake post-disaster relocation activities. The size of agencies gives them a comparative advantage over non governmental organizations (NGOs) in terms of economy of scale. For instance, they are capable of mobilizing personnel resources to meet the needs of large-scale relocation operations. However, while direct government action via existing agencies is effective for quick and large-scale operations typical after floods, it is less suitable for long-term policy planning for resettlement and relocation.

Since disaster response is inherently political, a disproportionate attention has been placed on ex post management rather than ex ante planning options to avert or prevent crisis. Long-term planned resettlement of communities and businesses from vulnerable zones is the least of agencies' priorities. For example, even though federal disaster laws in the US were changed in the aftermath of Great Mississippi Floods of 1993, only 15% of all disaster

relief funds are allocated to relocation, land acquisition, and other forms of hazard mitigation¹³. Given the increasing recurrence of floods, the use of non-structural tools, including resettlement for long-term adaptation to climate change, cannot be overstressed. The mobilization of personnel resources to initiate and speed up precautionary resettlement by governments is critical. There is a paucity of cases involving governments' direct actions in climate-induced resettlement. However, comparative lessons could be drawn from cases where governments have or are planning to strategically relocate some major capital cities in the world. For example, Brasilia was planted in Brazil's interior because the old capital, Rio de Janeiro, along with the entirety of Southeastern Brazil, was considered overcrowded¹⁴.

Government can engage directly via symbolic actions or leading by example. For instance, plans to ease congestion and generate balanced regional economic growth by relocating 27,000 civil service and other public sector workers outside of London to other parts of UK are in their maturity phase¹⁵. The Public Sector Relocation Project (PSRP) is coordinated by the Office of Government Commerce, an independent office of the influential Treasury Department. The PSRP is managed as an integral part of the Public Service Efficiency program. In the same light, governments can employ their personnel resources directly in cross-cutting programs, involving departments such as housing, city planning, social affairs, public health, finance, and environment for long-term relocation and resettlement of communities and businesses. As with PSRP, the coordination of resettlement programs could be handled by the Ministry of Finance in order to give them the necessary financial clout and political visibility.

To avoid some of the coordination problems involved in managing cross-cutting programs, governments may elect to create specialized agencies with a mandate to undertake long-term adaptation to climate change. Most disaster management agencies are ill-equipped to manage precautionary resettlement and relocation of communities and businesses to less vulnerable areas. For example, the United States Army Corps of Engineers (USNACE) is faulted by river conservation groups for failing to take into consideration the environmental costs and benefits of structural flood control projects. Furthermore, in the aftermath of Hurricane Katrina, there has been a proposal for the US Congress to create a recovery corporation that will oversee the buy-out of private homes in the area through the issuing of

¹² 'US Army Corps of Engineers Flood Plain Management Services Program' [http:// www.coastalstates.org/](http://www.coastalstates.org/)

¹³ Sendzimir et al (1999) Adaptive Understanding and Management for Floods

¹⁴ [http://en.wikipedia.org/wiki/Capital_\(government\)](http://en.wikipedia.org/wiki/Capital_(government))

public bonds worth \$30 billion.¹⁶ The creation of a new bureaucracy can attest to governments' activism in preparing society against vulnerabilities to climate change, thereby enhancing legitimacy and providing opportunities to build coalitions with environmental groups. Helming such new agencies at the level of the cabinet will give them the political muscle necessary for them to effectively plan and implement precautionary adaptation measures to climate change.

Governments may also engage directly in the provision of resettlement and relocation services through policy evaluation. For instance, though levees provide a limited level of protection, the Galloway Report, commissioned after the Great Mississippi Flood by the Clinton Administration, criticized structural flood control projects for creating a false sense of security that encourages floodplain development, multiplying the consequences of the levees and dams' inevitable failure. Flood losses in the US have nearly tripled since 1951, to more than \$4 billion annually (when adjusted for inflation).¹⁷ The economic cost of the 2005 floods for Central Europe is estimated at \$2.75 billion dollars.¹⁸

Governments can directly undertake precautionary relocation and resettlement initiatives via bilateral agreements or programs to restore floodplains. Riparian governments may opt for a win-win strategy for nature and human settlements by undertaking relocation and resettlement actions on floodplains to make room for the common river. For example, in 2000, the governments of Romania, Bulgaria, Ukraine and Moldova signed a declaration to restore more than 220,000ha of former floodplains along the Lower Danube “-roughly the storage capacity that is now missing on the lower Danube.” Some 200,000ha of the plains are now under water¹⁹.

Governments may also elect to directly implement precautionary relocation and resettlement action plans for climate change via a supranational organization. Governments may employ this route as a strategy to avoid strong domestic opposition to new environmental regulations. For example, the European Union could initiate a regional-level adaptation program for climate change with resettlement of flood prone communities and businesses as one of the instruments. The forthcoming discussions on the second phase of the European

¹⁵ <http://www.hm-treasury.gov.uk/media/CB3/3F/CoreCitiesresponse.pdf>

¹⁶ see Case file Number 12

¹⁷ Faber S. (1997).

¹⁸ European Flood Report (2005) Central and Eastern Europe (<http://gcportal.guycarp.com/portal>)

¹⁹ See Case file Number: 2

Climate Change Programme could provide a window of opportunity to push forward EU adaptation program for climate change.

3.1.2 Community and Voluntary Organizations

Unlike direct government, relocation activities can be carried out on a voluntary basis by community and non-profit organizations. Governments may have to create the conditions under which voluntary actors operate, or they may deliberately decide that they will do nothing about long-term adaptation to climate change, because they believe that businesses or non-governmental actors are already addressing the problem²⁰.

Governments may use their financial resources to support community based organizations to undertake relocation activities. For example, the Hazard Mitigation Grant Fund which was allocated to the Louise Town Community (LTC), USA, to address problems of repetitive floods by providing relocation assistance to low-income residents. LTC successfully acquired all at-risk structures and paid relocation cost of eleven families.²¹ Communities can be encouraged to band together to pressure governments to undertake precautionary relocation of people, businesses and properties from flood-prone areas. One example is the Shishmaref Erosion and Relocation Coalition in Alaska, USA, which consists of Shishmaref Native Village, City of Shishmaref, and Shishmaref Native Corporation (SERC)²². The SERC advocates for an expedited collective relocation of the Shishmaref community of 700 villagers to a higher ground, near the mainland of Tin Creek. SERC frames resettlement as a 'preemptive strategy' to preserve the sense of community by averting the social dislocations inherent in the individual relocation programs carried out by the government. Communities may also seize new opportunities offered by disaster management reforms to voluntarily relocate from harms' way. For example, flood-weary homeowners took advantage of amendments to federal disaster laws in the US, which set aside 15% of all disaster relief for relocation, land acquisition and other forms of hazard mitigation. In some cases, entire communities were relocated to higher ground, permanently reducing the threat of future floods²³.

²⁰ Howlett M. and M Ramesh (2003), p.91

²¹ <http://www.floods.org/publications/mit%20succ%20stories/mssiiims.htm>

²² <http://appropriations.senate.gov/hearings/record.cfm?id=223530>

²³ Faber S. (1997).

Not-for-profit organizations are quicker than governments in providing relief services to victims of floods and other natural disasters²⁴. Hence, they can build on their flexibility to provide grants and loans to communities in order to encourage them to relocate from flood-prone areas. Though there is a dearth of cases of NGOs directly involved in providing precautionary relocation activities, their proximity to local communities can provide a delivery mechanism for governments' acquisition and buy-out programs. Resettlement could be used as an instrument for coalition-building with river conservation organizations opposed to structural flood control methods like dams.

Environmental groups can use successful community-based relocation initiatives as evidences to challenge structural floodplain management policy paradigms. For example, Environmental Defense used the 'Living River Plan', a non-structural floodplain management plan proposed by a consortium of NGOs, activists, homeowners, business people and bureaucrats to make way for the Napa River, to call for reforms of USNCE. The plan, unlike the structural proposals of USNCE, encouraged the voluntary relocation of 16 houses, 25 mobile homes, 8 commercial buildings, and 13 warehouses from the river's banks and floodplains to give the river room to swell during floods²⁵.

Not-for-profit organizations can also engage in relocation actions by using their credibility, expertise and concern as resources to broker trans-border agreements between riparian states to protect floodplains. For example, the World Wildlife Fund (WWF) in 2000 facilitated the cooperation agreement for the creation of the lower Danube Green Corridor between the governments of Romania, Bulgaria, Ukraine and Moldova to restore the viability of Danube floodplains²⁶.

3.1.3 Market Creation

Governments can also employ market organization as an instrument to encourage voluntary relocation of communities and businesses from flood-prone areas. The most notable form of government involvement in market creation is the use of vouchers. Vouchers are papers with a monetary face value offered by the government to consumers of a particular good or service. Consumers can give these vouchers to their preferred supplier, who in turn presents

²⁴ Howlett M. and M Ramesh (2003), p. 91

²⁵ see Case file Number: 11

²⁶ see Case file Number: 2

the vouchers to the government for redemption²⁷. Governments can use rental vouchers to allow for individuals to exercise relatively free choice in deciding where to relocate. For example, after the 1994 earthquake near Los Angeles, California, which left 20,000 people homeless, Congress swiftly appropriated \$200m to provide special vouchers for use anywhere in the state. At least 10,000 people used them to move into stable apartments, often in better neighborhoods than those they had left²⁸. To minimize integration problems associated with individual vouchers, government can maximize group choice by providing group-based vouchers to communities to collectively exercise their free choice on where to relocate. Though this may be a novelty, it could be applied particularly to indigenous communities who are at risks of losing their cultural heritage.

3.1.4 Government Reorganization

Unlike direct provision, governments can use their organizational resources to encourage relocation of communities and businesses from flood-prone areas. Governments can use stakeholder consultations as an opportunity to share knowledge on the risks, challenges and rationale of undertaking precautionary vulnerability and adaptation measures for climate change such as relocation. Furthermore, consultations can be employed as a tool to set the agenda for precautionary adaptation action for climate change. For example, the European Commission sought the views of citizens and organizations in Europe on forthcoming EU action to reduce the risk of floods to people, property and the environment. Feedbacks from the consultation were incorporated into the proposal for a Floods Directive, which is one of the components of an action program on flood risk management that the Commission is preparing²⁹.

Governments can use stakeholder consultations as a tool to “alter policy processes in a way that they can retain their legitimacy or capacity to act.”³⁰ The procedural manipulation of the policy subsystem is very crucial for securing acceptability of precautionary relocation and resettlement actions. For example, in preparation of the “making space for river,” a strategy for managing the risks from flooding and coastal erosion, the UK government, under the auspices of the Department of Environment Forest and Rural Affairs (DEFRA), undertook

²⁷ Howlett M. and M Ramesh (2003), p. 91

²⁸ The Economist, September 25, 2005, also see Case file Number: 12

²⁹ http://europa.eu.int/comm/environment/water/flood_risk/consult.htm

³⁰ Howlett M. and M Ramesh (2003), p.102

a broad-based multi-stakeholder consultation exercise to solicit the knowledge of different stakeholders in the flood and coastal policy sub-sector³¹.

Governments can opt for broad-based consultations as means of reconciling the political scale of intervention with the geographic scale of action. For instance, relocation decisions of businesses and communities along a river basin may involve different administrative units, sometimes located in different countries.

Governments can also opt for consultations to evaluate potential impacts of relocation and resettlement of flood prone communities and businesses. The process can enable governments to efficiently target relocation funds or buy-in programs to the communities and businesses affected. For example, in large development projects, an Environmental Impact Assessment is mandatory in order to identify the potential socio-economic and environmental impacts.

For practical reasons, it is impossible to consult every affected individual. A key challenge, therefore, is the format in which different groups or stakeholders are engaged. Should participants involved in the consultation to decide on when, how and where to relocate be 'representative of interests' groups or 'representing interests' groups³²? The answer to this necessitates a case-by-case approach depending on the scale and objectives of the proposed actions. If it is to develop a long-term national or supra-regional framework or guidelines for managing precautionary relocation or resettlement, then considerable efforts should be invested on the selection process to ensure that those selected are credible and represent a wide range of interests in the community, rather than specific groups who may be unwilling to budge from their selfish positions. On the other hand, if it is to affect relocation of a specific community, then engaging with specific interests is crucial for the acceptability of governments' actions. Governments can standardize procedures for carrying out consultations by spelling out some broad guidelines for participation.

The next section deals with the group of instruments that relies more on strict regulation to achieve the goal of resettlement.

³¹ see Case file Number: 3

³² Petts (2001), p. 207-226.

3.2 Instruments of Authority

Authority-based instruments are defined as “a process or activity in which government requires or proscribes certain activities or behavior on the part of individuals and institutions, mostly private but sometimes public, and does so through a continuing administrative process, generally through specially designated regulatory agencies.”³³

These instruments are also known as command and control regulations, or in the distinction of “carrots, stick and sermon” they are referred to as the government’s “stick”. Such instruments are used in order to clarify norms and desirable behavior, or to regulate certain activities in a society³⁴. They therefore consist of defining activities as permissible and impermissible, together with the corresponding punishment or reward when undertaking such activities, however these are not of financial nature. Naturally, authority-based instruments seek compliance, thus their enforcement is necessary. The judicial role of regulation is one aspect of its rationale, the other two are efficiency and the trust of the public³⁵. According to Schneider and Ingram, authority-base instruments suppose, that even without concrete incentives subjects are committed to follow rules, laws and regulations. They state that citizens are assumed to naturally have some “loyalty to duty”.³⁶ That is the driving force behind the power of such instruments.

The advantages of authority-based instruments in comparison to other tools are³⁷: that 1) their implementation requires less information, 2) it is easier to establish prohibiting regulations than to promote a change in operations, 3) because of greater predictability they increase the chance for more effective coordination, 4) they are better suited in times of crisis, 5) such instruments are less costly compared to other instruments like subsidies and taxes, and 6) they are politically appealing when quick action is expected.

Unfortunately such instruments not only have positive sides, as their disadvantages include that 1) they distort activities in the private sector and promote inefficiencies by upsetting the market, 2) they can hinder innovation and technological advances, 3) they are rather inflexible, and do not leave space for adjusting to individual conditions, 4) authority-based

³³ Howlett and Ramesh (2003), p. 103

³⁴ Lemaire (2005), p. 59

³⁵ R. F. K. (1972) , p.881

³⁶ Schneider and Ingram (1990), p.514

³⁷ Enumeration based on Howlett and Ramesh (2003), p.104-105

instruments are not possible in all cases, and 5) their related costs (occurring from information gathering, investigation or prosecution) might be very high.

It is commonly noted that there is a difference between *economic regulations* (to correct imbalances and inequities in: prices, volumes of production, return on investment, or the possibilities for entry/exit of firms) and *social regulations* (that are about moral and physical well-being, such as health safety, civil rights, or discrimination)³⁸, these two groups we have separated as authority- and treasury-based instruments.

Since “social regulation is aimed at restricting behaviors that directly threaten public health, safety, welfare, or well-being”³⁹ unlike economic regulation, which “is aimed at ensuring competitive markets for goods and services and at avoiding consumer and other harms”⁴⁰ one would assume that for the relocation of communities as a measure of flood risk mitigation, governments would need to turn to social regulation to address the problems. At the same time, a balanced mixture of many different tools might be more effective for reaching a goal. In our assessment, we should argue for either standpoint and support our claim by the relevant cases we have gathered.

Command and control instruments can take many different forms. As we will see in the following, their discussion cannot be limited to “individual” instruments, as they enforce, validate and enable each other.

3.2.1 Rules, Laws and Acts

Achieving required action is best done through the establishment of rules. A government has the power through rulemaking to set up administrative or regulatory law in order to clearly specify what has to be done and how, or what is to be avoided and how. With regard to resettlement, this would mean the explicit specification of regulations on a given floodplain.

In the U.S. the Federal Clean Water Act (Section 404) (1972) can be seen as the greatest framework for the regulation of water and wetlands, and states have separately passed further legislation to assure compliance with it. Such laws will be discussed below in more detail when dealing with other instruments.

³⁸ For example: May, Peter J. (2002) “Social Regulation”, in *The Tools of Government*

³⁹ *ibid*, p.157

⁴⁰ *ibid*

Interestingly some states have designated “land subject to flooding” to be treated as protected areas under their Wetlands protection acts. An example for this is the Massachusetts Wetlands Protection Act (M.G.L. c. 131. § 40)⁴¹

Since we are interested in how to achieve the resettlement of people or communities from the proximity of rivers, regulation relating to wetlands, flood plains and natural reserves will be discussed as examples of regulatory instruments. Countries’ “efforts” to comply with the international agreement regarding wetlands, the Ramsar Convention (1971), can give us a hint on how to designate areas where certain activities should be restricted.

3.2.2 Zoning (US) or Land Use Regulation

Zoning is one of the most widely used “umbrella” instrument in consideration with floodplains. Under “umbrella” instrument we mean that it is usually combined with prohibitions, standards and permits – designating what one can or cannot do and to what extent in the given area. It is used for regulating the use of land, which is mapped and divided into different zones, according to certain criteria. We can see many cases of watershed protection that utilize zoning as the underlying measure. These are, for example in the U.S. the previously mentioned Massachusetts wetland act⁴², or the additional legislation passed by municipalities to support it, like the Town of Wellesley's Zoning Bylaw⁴³. As other example we can state the wetlands law in Virginia, which was enacted in 1972, by the Virginia General Assembly, and also utilizes zoning for regulating the development of wetlands⁴⁴.

In the U.S. the constitutionality of such zoning ordinances have been challenged in different instances, especially with regard to compensation payments concerning restrictions of actions by property owners, but U.S. courts repetitively uphold that zoning is the constitutional exercise of the government’s, states’ and municipalities’ police power, to be applied in order to regulate landowners. One such case is the *Just v. Marinette County*, when the Just family bought land lying within the wetland area designated by the Marinette County, Wisconsin, Shoreland Zoning Ordinance (No. 24, Sept. 19, 1967), and were denied

⁴¹ <http://www.mass.gov/legis/laws/mgl/131-40.htm> (last accessed 27.04.06)

⁴² R.F.K. (1972), p.879

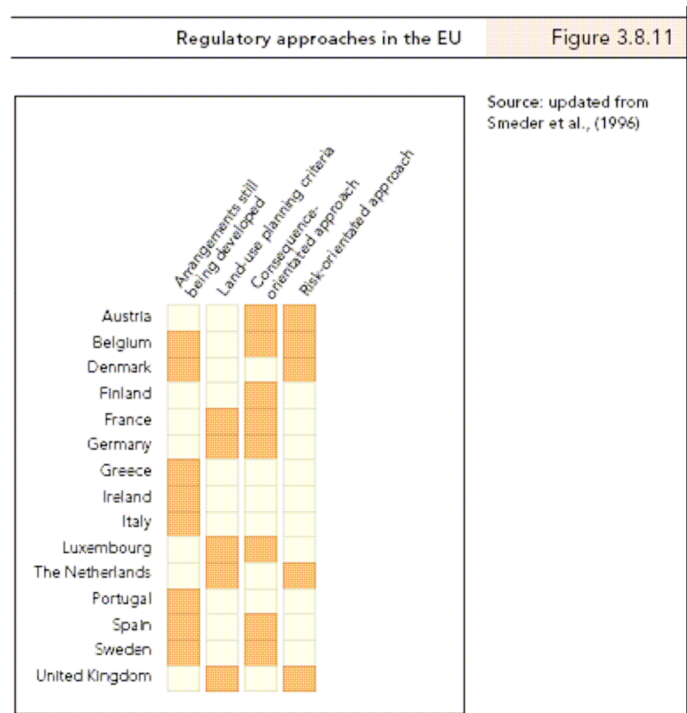
⁴³ http://www.ci.wellesley.ma.us/Pages/WellesleyMA_NRC/wetlands/index (last accessed 28.04.06)

⁴⁴ R.F.K. (1972), p.880

permit to fill their land on the basis of the above regulation.⁴⁵ This episode can show us how effectively such instruments can be used if coupled with strong judiciary backing.

Regarding land use planning for regulatory approaches to environmental issues France, Germany, Luxemburg, the Netherlands and the U.K apply these from the EU15 countries, as we can see from the chart on the next page (Figure 4).

Figure 4: Regulatory Approaches in the EU⁴⁶



Furthermore, one specific example of zoning from the European region can be the Water Act of Spain, which contains the designation of three different areas in the proximity of rivers: “restricted use, surveillance and flood risk zones”.⁴⁷ These three areas have the following definitions and regulations: 1) the restricted zone, which covers the first 5 meters on the bank of a river on both sides, has construction restriction attached to it under all circumstances, 2) in the surveillance zone, covering a 100 meter strip of the riverbanks, for any kind of construction authorization is needed, and 3) the flood risk zone is designed to cover the area the river could flood in the case of a 500-year return period flood carries the risk of flooding, so there awareness and certain adjustments are necessary.

⁴⁵ Environmental Law. Zoning. Etc (1973) p.1582-83

⁴⁶ European Environment Agency (1999), p.239

⁴⁷ European Environment Agency (2001), p.81

For another example we can look at the Dutch wetland, called De Biesbosch, which is owned by the Dutch Ministry of Agriculture, Nature Management and Fisheries, that adopted zoning as a measure to limit recreational activities in this National Park. Fishing, hunting and the access of the public is highly restricted in many zones.⁴⁸

Similarly to the Spanish Water Act, governments can turn to the instrument of zoning when detailing the specific measures that have to be taken into consideration with resettlement. A floodplain could be divided into various zones according to its flood risks and then diversified regulation could be tied to the different zones accordingly. This is an important feature when we consider not only the complete relocation of communities, but partial relocation as well. The regulation attached to specific zones could include the different other instruments that we are introducing in the following sections.

3.2.2.a Prohibitions/Bans

By definition, these are instruments that rely on the power of the government to claim that an activity is not allowed. The main rationale behind them is that banning an activity would get rid of it entirely. Though in general this might not be actually effective, with regards to relocating communities, it is definitely a powerful tool to stop people from settling in a risk-prone zone. The Maryland Nontidal Wetlands Act (1989) is one example of an Act that uses prohibition for the protection of wetlands. As we can see, such instruments can be tied to zoning, which makes them more rational and their enforcement easier.

3.2.2.b Permits, Quotas and Licenses

Naturally, regulation is not only possible through banning, but by regulating when and how an activity is allowed. Permits, quotas and licenses are such measures. They enable actors to undertake a certain action through obtaining them. The Maryland Tidal Wetlands Act of 1970 states, that in order for a landowner to be able to alter a wetland, a permit or license has to be gained by specific procedures.⁴⁹ According to this legislation, “General Permits” are given to projects that have minimal impact on the wetland in question, whereas an “Individual Permit” has to be gained for projects whose impact would be more significant.⁵⁰

⁴⁸ Wetlands International, Ramsar Sites Information Service: <http://www.wetlands.org/RSDB/default.htm> (last accessed 27. 04. 06)

⁴⁹ http://www.cbf.org/citizenguides/final_protecting_wetlands_site/3pw_knowing.htm (last accessed 27. 04.06)

⁵⁰ http://www.cbf.org/citizenguides/final_protecting_wetlands_site/3pw_permits.htm#table (last accessed 28.04.06)

Permits, licenses and quotas therefore help fine-tune the objective of zoning. In case of community relocation they can powerfully be used for regulating those activities that certainly need to be in the proximity of the river.

3.2.3 Standards

Standards act as official benchmarks for setting compliance measures with regards to certain environmental regulation. They can be of two different kinds: one is a uniform standard, which means that they apply to an entire industry or country. And consequently the other type is standards that apply to different actors differently with considerations of their individual characteristics.⁵¹

In the area of floodplains, standards can specify construction standards that need to be taken into account when building such infrastructure that needs to be in the proximity of the river. At the same time standards can also be used for assessing territories in order to apply zoning measures. For this, one example is found in the Massachusetts Rivers Protection Act⁵², that uses a standard for appointing what a densely populated area is: “an area of ten or more contiguous acres of land that is being utilized for intensive industrial, commercial, institutional or residential activities or combinations of such activities”⁵³.

Moreover, standards in a sense can work as overall targets for the government. For the resettlement of communities the number of people or number of communities that need to be relocated by a certain time can be brought up as an example. Though the ideology and the rationale behind the project is questionable, the Socialist Republic of Vietnam has turned to such measures after the reunification of the country in 1976. The government’s objectives were the relocation of 10 million people and the opening up of 5 million hectares of agricultural land before the end of the 20th century.⁵⁴

3.2.4 Enforcement

Enforcement of government regulation is the key issue when considering effectiveness, unfortunately in many instances we can see that because of lax enforcement the originally well developed law can fail to achieve anything. Just to name a few examples: the instrument

⁵¹ Wilkinson (2004), p.135-144

⁵² Authority granted by M.G.L. c. 131, § 40 amended by St. 1996, c. 258, and by M.G.L. c. 21A, §2. at: <http://www.mass.gov/dep/water/laws/301cmr10.pdf> (last accessed 27.04.06)

⁵³ Ibid, 10.05, p.4

⁵⁴ Desbarats (1987) p. 50

of zoning and bans has to be consistent. We can see that in many different cases zoning regulations relating to prohibiting construction in flood-prone areas had been invalidated on the grounds of individual considerations.⁵⁵ Furthermore, there might be an institution of permit requirement, when permits are rarely denied – as for example was in the case of Virginia, one needs to question whether this tool of government is effective at all in limiting certain activities.⁵⁶

The power of agencies to enforce also links to their ability to monitor and control. That is why the arrangement in Massachusetts, which gives them the right to enter private property to enforce compliance, is a step forward in solving this issue.

Overall, assessing the advantages and disadvantages that were mentioned in the beginning of this section, we can draw the following conclusions. Authority based instruments are inflexible and a comprehensive regulation of floodplains requires a lot of information, therefore a relatively big amount of money. However, if they are well-enforced and particularly well-designed, these instruments or their combination can be greatly effective for achieving a settlement-free floodplain and mitigate future flood induced damages.

Instruments of authority could be useful in bringing about resettlement in cases where it is determined to be necessary. There are, however, still other options that are available to policy-makers. One area is using the financial power of government. This will be covered in the next section.

3.3 Instruments of Treasury

Treasury is the group of policy instruments that utilizes the financial resources of government. It can include instruments both to collect funds and to distribute or to invest them.⁵⁷ These resources of the treasury can be and are often used to achieve goals in the area of environmental protection. Particularly in cases of resettlement, government will need to consider the range of options that its power of the purse can provide.

As outlined in the section on instruments of authority, the government can use its powers of command and control to achieve results. However, this power is often limited due to the legal rights of various actors and stakeholders in society. Utilization of financial resources is

⁵⁵ K, R.F. (1972), p. 877

⁵⁶ K, R.F. (1972), p. 879

⁵⁷ Howlett M. and M Ramesh (2003). p. 108.

thus particularly important in societies when decisions are largely subject to the wishes of non-governmental and private actors and stakeholders. They are also salient in location decisions, since property rights in developed countries are often well-defined. In such cases, private decisions can be best influenced through financial incentive or disincentive. In this way, individual and group preferences are respected, but rewards are given to those who pursue government preferences.

Assessing instruments of the treasury can result in both advantages and disadvantages. An important advantage is the non-coercive nature of these instruments. This is the case because these instruments are not necessarily restrictive; rather, they provide incentives to encourage or discourage certain behaviors.⁵⁸ Another positive characteristic of these instruments is that they generally have high visibility. The amount of public expenditure invested in such instruments is easy to track in annual budgets, and they are not hidden from periodic review processes of their effectiveness and efficiency.⁵⁹ Treasury instruments do not, however, perform as well as others, or at least as consistently well, on other scales. Some financial instruments can be rather automatic, meaning that they use existing structures for implementation, such as in the case of utilizing tax administrations for implementation.⁶⁰ In some cases, as will be seen in the following sections, there may be the need for creating a new administrative unit to manage the utilization of financial resources. In a similar way, some financial instruments may be less direct. This is the case when more than one or perhaps a constellation of organizations is required to plan, finance, and implement an instrument.⁶¹ While a higher degree of directness can be considered beneficial for the sake of efficiency, coordination between government and non-governmental actors can also be useful, as will be seen in upcoming examples.

The following section will introduce the range of instruments of the treasury that are available, and it will provide a brief description of the ways in which these instruments could be used to achieve resettlement. When available, specific examples from actual cases will be briefly mentioned.

⁵⁸ Salamon, L.M. (2002), p. 1-41.

⁵⁹ *ibid*, p. 35-36.

⁶⁰ *ibid*, p. 32-33.

⁶¹ *ibid*, p. 27-29.

3.3.1 Subsidies: Grants, Tax Incentives, and Loans

One of the well-known ways in which government utilizes its financial resources is in the form of subsidies. Subsidies are an important tool, which can encourage private persons and businesses to resettle from one location to another. This can be done through grants, tax incentives, and loans.

Governments can provide a positive incentive for individuals, groups, or organizations to resettle by providing grants. Grants are one of the most well-known forms of subsidies. They are generally provided in order to encourage the means that can produce a desired end. Often, they are directed toward producers, in order to encourage them to supply goods and services that are more socially desirable than those that they would supply without any intervention.⁶² In the case of resettlement, the goal is to encourage private decision makers to live or work in a more desirable location than in a flood prone area. The possibilities range from providing subsidies to purchase new land or buildings or to defray the costs of moving from a less-desirable location to a more-desirable one. In the case of Valmeyer, Illinois, USA, the State of Illinois offered grants not only to help the community resettle after the devastating Great Flood of the Mississippi River in 1993, but it also encouraged the reconstruction of homes to include sustainable, energy-efficient technology. In this case, the State of Illinois' Department of Commerce and Community Affairs (DCCA) provided individual grants to residents of up to \$1,700 to residents, and a total of approximately \$70,000 was provided overall.⁶³

A similar but less direct way of providing a financial incentive is through tax incentives. Also called tax expenditures, these incentives include the forgoing of various forms of government revenues, such as taxes, royalties or license fees. Thus, they tend to be rather automatic and visible. Such incentives are subsidies because revenues, which government would normally collect, are not collected.⁶⁴ Tax incentives have been frequently used to encourage private decision-makers to choose to locate in specific areas. They are often used by local and provincial governments to attract business and industry into their taxing districts. In the same way, such incentives can be used to achieve resettlement either away from floodplains or to non-flood-prone areas. An example of how such tax incentives can work can be illustrated by the Low-Income Housing Tax Credit (LIHTC) program, a tax

⁶² Howlett and Ramesh (2003), p. 108

⁶³ see Case file Number: 18

⁶⁴ Howlett M. and M Ramesh (2003), p.109

incentive program established by the United States federal government. In numerous communities around the country, LIHTC is being and has been utilized to achieve relocation, or resettlement, of low-income residents. In Atlanta, for example, 540 housing units were constructed for low-income families utilizing the government's LIHTC Program.⁶⁵ While such an instrument may be novel for the purpose of inducing flood-threatened home or business owners to relocate, it has certainly been utilized successfully in other circumstances involving housing relocation.

Loans are a third tool in the financial incentive toolbox. When loans are provided to members of the community at an interest rate lower than that which could be acquired on the free market, this can be considered as a subsidy.⁶⁶ The difficulty of acquiring capital at an affordable price can sometimes be the main factor preventing individuals or firms from changing their location. For those that fall into this category, affordable capital, provided by a local, provincial, or national government, can be exactly the extent of assistance necessary to change a decision from remaining in a location to moving to a new one. One successful example of loans encouraging relocation can be found in Empowerment Zones in the United States. In Boston, for example, loans are provided by the Boston Redevelopment Authority to businesses who are interested in relocating to or expanding within a specially designated zone.⁶⁷ Such an instrument could also encourage flood threatened home or business owners to relocate to safer areas.

Sometimes subsidy instruments can be combined. For example, loans can be provided to achieve resettlement, and they can be converted into grants after a certain period of time. This combination of instruments has been successfully implemented in Israel. The Israeli Disengagement Authority has encouraged resettlement from communities in Palestinian areas to others. According to the Authority, settlers moving from Palestinian areas to 'national priority areas' are provided with loans of 135,000 ILS (ca. 24,000 EUR). These loans are turned into grants after the settlers have stayed in their new towns for at least five years.⁶⁸ This time lag helps to ensure that residents integrate themselves into their new communities, thereby increasing the likelihood of the permanence of their move, before rolling the loan over to a maintenance-free grant. Such creative combination of various

⁶⁵ Salama, (1999), p.106

⁶⁶ Ibid, p.109

⁶⁷ Boston Redevelopment Authority, www.cityofboston.gov/bra/bostonez/

⁶⁸ Israeli Disengagement Authority, www.jewishvirtuallibrary.org/jsource/Peace/compensation.html, also see Case file Number: 4

instruments can also be an option in utilizing instruments to achieve resettlement in varying settings.

3.3.2 Financial Disincentives: Taxes and User Charges

Financial instruments such as taxes and user charges are a common way for governments to raise revenues. However, they can also be implemented to provide a financial disincentive. These instruments can work in two ways: either by discouraging an undesired behavior or by encouraging a desired one by charging for an alternative behavior.⁶⁹ Included in this range of instruments are payroll or property taxes, negative taxes, and user charges.

Payroll taxes, the first type, are often used to collect an insurance pool for particular risks. Then, when the undesirable happens, the one who has paid into the payroll tax fund is financially supported by the fund.⁷⁰ In this case, insurance provision is not made voluntary through the private market; rather, it is made compulsory through a level of government. The advantage is that required membership in the fund makes the pool of those insured much larger, thereby reducing the rates of premiums for individual members and disbursing the risk of certain activities among the entire population.⁷¹ While such an insurance fund may not have been set up yet for the purpose of pursuing resettlement, such a system should be theoretically possible. Perhaps more sensible in the case of resettlement would be property taxes in flood-prone zones, which also could be funneled into a common insurance fund. With such an instrument, insurance liability can be redistributed locally, regionally, or nationally, depending upon need.

Taxing power of government can also be utilized in the form of a disincentive or sanction. In this way, government can indirectly discourage consumption of certain goods or services by making their prices higher.⁷² While such a measure has often been utilized to discourage things such as smoking, drinking, or gambling, it could certainly also be established to discourage individuals or firms from locating to or remaining in areas that are prone to flooding. A tax on property could be possible in special zones where living and working should be discouraged. Revenues collected could, then, be used to pursue complimentary measures to achieve resettlement.

⁶⁹ Howlett M. and M Ramesh (2003), p. 110

⁷⁰ Ibid. p. 111

⁷¹ Ibid. p. 111

⁷² Ibid. p. 111

It has already been shown that location decisions can be influenced by the rate of taxation on land. In many cases, development has been directed and promoted through tax-free development, which has been so successful in the case of industrial and technology parks, such as RTP, Research Triangle Park, in North Carolina. Such an incentive has contributed to \$2 billion in investment and the creation or relocation of over 37,000 jobs.⁷³ Precisely in the opposite way, high taxes on land should have a similar inverse impact upon location decisions. When setting these tax rates high enough, command and control regulation will be redundant due to the strong incentive to locate elsewhere.

Finally, government can put a flat rate price on certain behaviors that it wishes to discourage. This is basically the opposite of rewarding positive behaviors with subsidies. Known as user charges, this instrument type is a mixture of government regulation with a market-based approach. In this case, government sets a fee for an activity that it wishes to limit or fully discourage. This extra cost leads individuals and firms to conduct a cost-benefit analysis and potentially reduce their consumption of a good or service to the point where the benefits outweigh the costs. In this way, more socially-acceptable alternatives that do not carry such associated costs are sought.⁷⁴

One mechanism, similar to user charges, which is often used in land use control is the impact fee. These one-time fees must be paid to local or regional governments for the right to construct something on land. The State of Arizona was first to utilize them, starting in 1982, and they have become quite common in the American context.⁷⁵ Although this instrument is usually intended to help raise money for the necessary public services to accompany development—and not to stop development—it could be set far higher than usual in flood-prone areas in order to make development in safer areas more attractive. Theoretically, user charges could also be placed upon existing activities such as living, producing, or selling goods or services within flood-prone areas. This would, then, have an effect upon those who were already living in unsafe zones. When the user charge is placed high enough, residents and firms will eventually decide to move to other locations outside of zones that do not contain user charges. In utilizing such a measure, the rationale could be the reduction of the negative externality provided to society by those living or working in

⁷³ see Case file Number: 15

⁷⁴ Ibid. p. 111

⁷⁵ National Conference of State Legislatures (1999)

flood-prone areas by reducing the likelihood that public funds will be needed to ‘bail them out’ when a flooding disaster occurs.

Some creative policy measures have been made to combine subsidies with financial disincentives. In this case, funds can be collected in the form of user fees and then distributed in the form of grants to achieve various goals. One way is for government to use flood insurance premiums to finance resettlement programs. For example, the US Congress reformed the Federal Flood Insurance Program to set aside \$20 million annually for relocation projects, with the funds being derived from flood insurance premiums⁷⁶. A similar approach is used in France where every French house and car insurance premium is subject to a compulsory extra charge of 12% (initially 6% but increased in steps to 9 and, finally, to 12), and the money goes to a fund on natural hazards, but is kept by insurance companies⁷⁷. However, instead of covering losses incurred and their consequential moral hazard incentive, the fund can be used to fund relocation and resettlement programs. These types of innovative policy-making can be replicated in a variety of settings to achieve positive results.

3.3.3 Removing Unwanted Subsidies: Hidden Subsidies

One of the less-considered instruments of the treasury is the review and removal of financial instruments that actually counteract the intended goals of a government policy. One good example of this non-strategic investment is the US Army Corps of Engineers’ annual spending of around \$1 billion on construction and repair of flood-control infrastructure. Although the goal of this investment is to reduce losses from flooding, it actually subsidizes additional development in flood-prone areas, which increases the likelihood that there will be even more catastrophic results when floods do occur.⁷⁸ In order to avoid such policy outcomes, investments can be rethought, and these negative subsidies can be reduced or eliminated in annual budget allocations.

An example of hidden subsidies comes from the State of Missouri following the Great Flood of 1993. As in some other American states, government can designate blighted areas as tax free in order to encourage development or redevelopment. This system, which is called tax increment financing (TIF) has been used in a variety of cases to achieve its

⁷⁶ Faber S. (1997).

⁷⁷ <http://www.ecologic-events.de/floods2003/de/documents/BernardBarraque.PDF>

⁷⁸ see Case file Number: 5

intended goals. However, its usage can bring detriment: it enabled tax incentives to be used to build a large, big-box retail center in the Chesterfield Valley adjacent to the Missouri River in the late 1990s, land that was deep under water in 1993.⁷⁹ Such a hidden incentive certainly requires review and revisions so that no longer contributes to further patterns of development that are in flood-prone areas.

The provision of government bail-out funds following a flood is yet another form of unwanted subsidies. It involves free riding and moral hazard, since it removes incentives for individuals and firms to make better decisions that will better protect themselves. A creative policy measure has been implemented in Finland to reduce this threat of moral hazard. Whereas government compensation is automatic in some societies, it is not in Finland; rather, compensation is only provided when a flood is considered to be exceptional, meaning that the area in question has not flooded in the last 20 years. Each year, a limited amount of funds are placed in a government account that will be divided among those who are affected by flooding. Each case is considered individually, and no full-payment compensation is made—80% is the maximum allowable reimbursement. Furthermore, since this fund is limited, the amount could be much less, because it must be divided among all flood victims for the year. Finally, Finnish insurance companies do not provide coverage against flooding.⁸⁰ While this system provides some compensation, it drastically reduces moral hazard, thereby reducing hidden subsidies for individuals or firms to locate or build in potentially flood-prone areas.

3.3.4 Interest Group Funding

A final area of treasury-based instruments is funding to interest groups. According to public choice theorists, interest groups cannot spontaneously become a force for developing solutions to societal problems and influencing the policy process. Instead, they need a broad amount of support in recruiting quality staff, achieving high levels of confidence, and collecting the funding needed to engage in their work.⁸¹ While interest groups could be supported through the private or non-profit sectors, there is also a potential role for government to play. If a government wishes to encourage grassroots support for resettlement, it may establish connections to environmental or sustainability-oriented civil society groups. In providing them funds (in addition to other resources, such as information

⁷⁹ Luce T. (2003), Executive Summary

⁸⁰ Sustainable Water Use in Europe (2001), p. 83

and technical assistance), the government can help bring the need for resettlement onto the public agenda. The level of government involvement in funding interest groups varies greatly across different cultural contexts and might be difficult to utilize in some areas. However, proving such direct funding is an instrumental option for government in the achievement of resettlement.

3.4 Instruments of Nodality

Nodality instruments concern the use of information by a government⁸² and its ability to be at the centre of social and informational networks.⁸³ We add to this category the other tool with the lowest degree of coercion⁸⁴: voluntary action, which is any action of private actors stemming from free will, having a moral purpose, and undertaken in a spirit of independence.⁸⁵

The government has a privileged position in collecting information from and disseminating it to society.⁸⁶ Due to innovations in communication technologies over the last half-century, societies evolved to knowledge-based and information societies.⁸⁷ In this context, the relative importance of nodality tools compared to other policy tools has grown more than ever. The increased use of nodality is a positive evolution as it is very consistent with liberal democracies based on freedom, debate and individual responsibility.⁸⁸

The greater access to information allows private actors to act on behalf of the society or at least of a part of it more easily than before, when this access was restricted to higher spheres of decision-making. Firms engage in corporate social responsibility actions and sign voluntary agreements. Many non profit organizations volunteer in order to improve general welfare.

While the coerciveness of nodality and voluntary instruments is definitely very low, the other dimensions are variable: there is a tendency towards indirectness and non automaticity and rather more visibility, but it is not always the case. Information diffusion can be highly

⁸¹ Ibid. p. 113

⁸² Howlett M. and M.Ramesh (2003), p.114

⁸³ Margetts H. (2003), p.7

⁸⁴ Salamon L.M. (2002), p.15

⁸⁵ Knight B. (1993), p.XII

⁸⁶ Margetts H. (2003), p.7

⁸⁷ Juillet L. and G.Paquet (2001), p.2

⁸⁸ Howlett M. and M.Ramesh (2003), p.115

direct and automatic, for example when an official (president, minister, ...) talks to the population through television or radio. But it often involves media participation which makes it a rather indirect tool. Voluntary action can be very direct, when an actor decides to engage in a voluntary action, and very indirect, when a voluntary program is suggested by the state to private actors. In each case, voluntary action is not automatic, while information can be diffused through existing channels. The budgetary visibility of both instruments is very low. The physical visibility of voluntary action varies. In the same concern, nodality is special inasmuch as it is the goal of information to be as visible as possible.

The advantages of voluntary action and nodality instruments are first of all their low cost and high flexibility, because they do not need big bureaucracy nor enforcement mechanisms.⁸⁹ Information can be released very quickly and easily, through printed media, broadcasts, conferences or virtual channels. These advantages make nodality the first envisaged policy and an ideal starting point for dealing with new problems, even when solutions do not yet exist.

Information can be very efficient when it raises the awareness of the existence of a possibility to improve its own condition or of a very serious and urgent problem to the point where the people feel like an obligation of reacting. In most other cases, information alone usually fails to create enough effect to change a situation. It is a necessary tool for raising awareness of a problem, but its insufficient force makes it a complementary instrument, best combinable with any other, stronger instruments.⁹⁰

Voluntary instruments, even though they can be suggested by government, or agreed upon, is an independent action of a private actor. These instruments have become fairly popular recently.⁹¹ Even though they are supposed to be very effective, because they are not imposed but chosen by the actor himself, they also happen to be implemented only half-heartedly.⁹² Their effectiveness depends on the real motivation behind the initiative.

On the following pages, information and voluntary action will be given a closer description.

⁸⁹ Howlett M. and M.Ramesh (2003), p.115

⁹⁰ *ibid*, p.115

⁹¹ Sterner (2003), p.70

⁹² Ringeling A.B. (2002), p.591

3.4.1 Information: Inquiries, Information Campaigns and Suggestions

As the last of the triad “carrots, sticks and sermons”, information is a basic category of policy instruments.⁹³ It is a fundamental tool upon which every policy depends.⁹⁴

Since the complexity of environmental problems makes them particularly challenging for policy makers, information about interactions and interdependences in the natural and the human sphere need to be considered in a particularly comprehensive way.⁹⁵ Commissions and inquiries involve researching information, and are set up to clarify new problems, and sometimes also to delay decisions or even hide inactivity.⁹⁶ Knowledge about natural and social conditions is an evident precondition for any relocation program. Many rivers in Europe already have their river basin commissions with researching and controlling activities.

Information can be both a policy input as well as an output: it is needed by decision-makers to make best possible policy choices. It can also be released by them as a tool to change other actors’ perceptions and preferences.⁹⁷ This can be done in different ways:

The pure dissemination of general information through advertising and public information campaigns serves the awareness rising on a problem in the population.⁹⁸ The population is made conscious of the problem and can choose how to react. The aim is that the informed population makes choices according to the new knowledge, but it is totally free to do it or not. In the case of floodplains, it is certainly seen as a duty of the state to create institutions capable of warning its residents on potential floods and flood risks, to allow them to react in an adapted way. Campaigns can also serve to inform the population about governmental activities and plans relating to a public problem. For example, the French “Plan Loire Grandeur Nature” consists in educating the local population by publishing maps designing high risk areas along the Loire river as an incentive for them to avoid further settling down in the dangerous areas.⁹⁹

⁹³ Sterner T. (2003), p.67

⁹⁴ *ibid*, p.67

⁹⁵ European Environment Agency (1999), p.5

⁹⁶ Howlett M. and M. Ramesh (2003), p.114

⁹⁷ Salamon L.M. (2002), p.15

⁹⁸ Howlett M. and M. Ramesh (2003), p.114

⁹⁹ see Case file Number: 14

The state can go further towards giving advice, exhortations, and suasions.¹⁰⁰ Education could be added to this section. This time, the government makes an effort to change the way of thinking and the behavior through more concerted and targeted information. Consultative meetings between government and private actors can also serve this objective.

Awareness raising and information release is a part of paramount importance for any policy concerning flood damage prevention, since the population and especially their security are directly concerned by it.¹⁰¹ In Europe, International River Organizations have been established to coordinate actions of countries confronted with trans-boundary rivers, like the Rhine or the Danube. These organizations, for example the International Commission for the Protection of the Rhine, are mandated to collect information by analyzing the flood risk situations of the rivers, and to release information to raise the risk-awareness of local populations.¹⁰² They can advise the populations how to reduce the risks individually in an adapted manner, for example by avoiding settling down in a risky area or even by resettling out of it.

3.4.2 The Voluntary Approach: Voluntary Action and Agreements

Increased information access, the discovery of various market failures and growing sensitivity regarding environmental and social conditions enables stakeholders like ethical investors, consumer federations, labor unions, other non-governmental organizations or the media to put increasing pressure on firms to consider their negative impact on nature and their employees.¹⁰³ Legal environmental restrictions spread more and more. Enterprises answer to this pressure with self-regulation in order to avoid negative publicity or binding laws.

The pure form of voluntary action consists of a private actor deciding on its own to reduce its negative externalities or to better contribute to social welfare. The typical case is when a firm undertakes corporate social responsibility actions. A variant is when the firm exceeds legal regulations.¹⁰⁴ By doing this, the firm might have in mind to anticipate and forestall stricter laws in the future, or to gain competitive strength by inducing tighter standards

¹⁰⁰ Howlett M. and M. Ramesh (2003), p.114

¹⁰¹ Tyagi A.C. (2006), p.12

¹⁰² IKSIR/CIPR (1998), p.4

¹⁰³ Arora S. (1996), p.414 and Cunningham J. (2004), p.1

¹⁰⁴ Arora S. (1996), p.414

which would increase competitors' compliance costs. A third explanation for self-regulation can be simple costs savings, for example through investments into energy saving appliances.

Voluntary action can also be suggested as a program by a government.¹⁰⁵ Self-regulation can involve important investments and presuppose coordination between different actors. For this reason, voluntary agreements or covenants can be engaged, be it within an industry sector, in order to harmonize the competitive conditions, or between private and public representatives.

When negotiating a voluntary agreement, state and private actors are on a similar bargaining level.¹⁰⁶ This can lead to weaker measures than would have been taken in a regulation, but with higher effectiveness and efficiency, as the private actor is more resolute to apply what should be a better adapted measure to the firms conditions.¹⁰⁷ The lesson which can be drawn from this statement is that participatory decision-making can improve effectiveness and efficiency of a policy by integrating preferences and conditions of the actors concerned by this policy.

Voluntary agreements are appreciated by public officials for they save legislative and enforcement costs, and furthermore potentially increase popularity amongst managers and the population at once, as an efficient measure satisfying everybody is found.¹⁰⁸ Indeed, the greater flexibility of such an agreement lowers compliance expenses for the private sector in comparison to the case of a strict regulation. A voluntary action can also serve both public policy designer and private managers as a testing phase to analyze the conditions for a potential future regulation.

Concerning resettlement, a slightly different approach than the one mentioned above must be adopted. Contrary to pollution abatement or corporate social responsibility actions, resettlement serves primarily to reduce the actors own risk of being damaged by floods and is less a moral action in order to improve social welfare. Voluntary action must therefore be redefined for this case: here it mainly consists of an individual or a local community taking a bottom-up initiative for the own resettlement or relocating out of free will. Such initiatives usually occur in repeatedly flooded areas.

¹⁰⁵ Cunningham J. (2004), p.5

¹⁰⁶ Ringeling A.B. (2002), p.591

¹⁰⁷ Innes J.E. and D.E. Booher (1999), p.414

¹⁰⁸ Arora S. (1996), p.430

In the Dutch Overdiepse Polder case¹⁰⁹ for example, the inhabitants and enterprises established on a risky part of the Meusel riverside elaborated a concept for the arrangement of their area. To compensate the rise of the water level due to higher water discharge, the proposition consists in widening the river basin and rebuilding the houses along the planned new dyke. By doing so, the local community made sure that it was involved in the planning from the very beginning. The realization of the project was delegated by the national government to the regional authority to facilitate the cooperation with the inhabitants. The main problem remains the time necessary to carefully decide on a concrete design of the project, a process supposed to last about 10 years.

Another local initiative can be found in the small Moos village in Bavaria, Germany.¹¹⁰ Flooded three times in 1999, 2002 and 2005 by the Elbe river, the residents of the village wish to resettle in a nearby locality. The main problem they face is of financial nature. The large costs of repairing the recent flood damages and the little size of the village and of the commune makes their resettlement dependent on a larger financial support from the Länder or national level, which takes time to be granted.

A similar situation can be found in the United States. According to the “Flood Loss Reduction White Paper” by the non-governmental organization “Environmental Defense”, ten thousands voluntary flood relocations took place in the USA in the wake of the Great Flood of 1993.¹¹¹ However, demands for resettlement from other thousands of Midwestern wetlands’ farmers were rejected due to a lack of funding. “Environmental Defense” represents the other variant of voluntary action for relocation: the NGO promotes flood resettlement through campaigns and by giving information on the available relocation programs existing in the USA.¹¹² It encourages relocation not only for reducing costs and risks for humans, but also for restoring the natural state of rivers and floodplains with their capacities of self-regulation.

In consideration of resettlement of a riverbank community, being as transparent as possible about flood risks and institutional answers to these risks seems to be a fundamental condition for any good risk management. Information not only allows individual responsibility to take necessary measures, it is also very cheap, flexible and quick. Simple information might however not be sufficient. Most people react only when they become

¹⁰⁹ see Case file Number: 13

¹¹⁰ See Case file Number: 10

¹¹¹ Environmental Defence b)

conscious of the urgency and severity of risks, or when they have experienced several floods.

The state might also establish a voluntary resettlement procedure and suggest it to concerned communities. In such a procedure, conditions and costs, as well as the time frame might be considered. Voluntary resettlement is certainly much cheaper, easier to realize and more legitimate than an involuntary one, but it usually still requires financial and logistic support from government or alternatively from a non-governmental organization.

3.5 Summarizing the Range of Instruments and Policies

This chapter on instruments illustrates the very large range of options that policy-makers have at their disposal. Although many of these instruments have never actually been used to assist in resettling populations that were in danger of being flooded, the potential for doing so is quite great. Furthermore, with the creative and innovative work that communities are doing around the world, there are bound to be new solutions. Therefore, this list is probably not exhaustive.

The surprising finding, however, is how limited the use of some of these instruments actually is. Despite the breadth of this list, many cases and tools are scarcely utilized, at least when compared to the exceptional capacity that they have to discourage development, enable rebuilding, and prevent certain behaviors. In fact, the need for development of new instruments for resettlement is not necessary. The mere optimal utilization of those instruments that do exist is what is needed.

Another important summarizing point is the capacity that instruments have when used in combination. Although many cases attempted to solve a problem by the utilization of a single instrument, the most efficient scenario could, in fact, be when different instruments of different classifications are used simultaneously. For example, a local resettlement campaign could arguably be most effective when instruments of nodality, such as information provision, are first used. Then, the reorganization of an administration to pursue a new goal—resettlement—can be followed by financial incentives and disincentives to implement this plan. Finally, when all other measures have been attempted, more strict authority measures, such as command and control, can be utilized. Of course, this combination and sequence can be different in every community. However, the power of

¹¹² Environmental Defence a)

using these instruments jointly is something that must be more carefully considered in the future.

In order to provide some assistance to policy-makers in the process of instrument choice, this long list of instruments must be compared and assessed. The hope is that the following section will give the reader guidance in deciding what policy instruments to choose in a variety of contexts.

4. COMPARATIVE ASSESSMENT

With an understanding of the range of instruments available for achieving resettlement, an assessment can be made by comparing different instruments. Each instrument will be evaluated based on four criteria: effectiveness, efficiency, coerciveness, and flexibility. All evaluations will be made on a scale of low, medium, or high. Effectiveness is an assessment of the extent to which an instrument achieves its goal. This includes the ease of which implementation of this instrument is achieved. Efficiency is understood as an assessment of instrument costs versus overall benefits. The extent to which an instrument forces action or leaves the decision to individuals or groups is called coerciveness. In general, a less-coercive instrument is more politically acceptable, and vice versa. Finally, flexibility is used as the measure of adaptability of an instrument to specific cases and to changing situations over time. Although there are other possible criteria for evaluating instruments¹¹³, these four criteria can be seen as the most important for a broad range of actors and stakeholders in the area of instrument choice.

Table 2: Assessment of Instruments

INSTRUMENTS	EFFECTIVENESS	EFFICIENCY	COERCIVENESS	FLEXIBILITY
Organization-based				
Direct Government Provision	High	Low	High	Low
Community and Voluntary Organization	Medium	Medium	Low	High
Market Creation	Medium	High	Low	High
Government Reorganization	High	High/Medium	Low	High
Authority-based				
Rules, laws and acts	High	Medium	High	Low
Zoning, land use regulation	High	Medium	High	Low
Prohibitions/bans	High	Medium	High	Low
Permits, quotas and licenses	Medium	Medium	High	Low

¹¹³ Salamon (2002), p. 22-37.

Standards	High/Medium	Medium/Low	Medium	Low
Treasury-based				
Grants	High	Medium	Low	High
Tax Incentives	Medium	High	Low	Medium
Loans	Medium	High	Low	High
Taxes	Medium	High	Low	Low
User Charges	High	High	Medium	Low
Removing Negative Incentives	Medium	High	Medium	Low
Fund Interest Groups	Low/Medium	Medium	Low/Medium	High
Nodality-based				
Inquiries	High	High	Low	High
Info campaigns	Medium	Medium/High	Low	High
Voluntary Actions	Medium	Medium/High	Low	High

With the exception of direct government provision, organization-based instruments are high in terms of flexibility, hence can easily be adapted to suit the needs of relocation and resettlement in different circumstances. Organization-based instruments also command legitimacy and are high in terms of political feasibility. This implies that they can easily be implemented and are effective in meeting the goals of precautionary resettlement and relocation of communities and businesses from flood prone areas.

Although instruments of authority are very coercive, and as such are probably not preferred until a wide range of other instruments have been exhausted, they are by definition rather effective. Despite the fact that effectiveness depends highly on enforcement, authority based instruments can achieve a level of compliance that other instruments can not. Furthermore, since their costs are considerably lower than those of the treasury based instruments (except for revenue-generating mechanisms), however higher than the instruments of nodality, their cost efficiency is in the middle range of possibilities. The weak point of these instruments is their inherently inflexible character. It is extremely difficult to alter them according to emerging needs, or in the case of floodplains, according to the needs of specific areas. Therefore in order to make the most use of them, the lowest level of authority needs to be in charge of specifying and implementing them.

Meanwhile, instruments of the treasury, as one can see in Table 3, are, as a whole, quite efficient. At times they may involve considerably high costs, but they typically are very good at achieving the corresponding and sought benefit. The other real advantage is the overall low level of coerciveness that financial instruments involve. They nearly always allow private actors and stakeholders to make their own decisions. This does not mean that there are no strong financial advantages or disadvantages to certain options. Nevertheless, these instruments work well within a market-based system to guide behavior rather than forcing it. Since these instruments are less coercive, it is inevitable that they lack some degree of effectiveness. Despite this fact, though, most instruments are generally effective. Only the funding of interest groups could, at times, be money that is invested without great return. Finally, the degree of flexibility varies considerably. Grants and loans can be easily altered and distributed to fit a variety of settings. This ability, however, is considerably limited when dealing with user fees and taxes. In general, these disincentives need to remain equal in order to maintain fairness and legitimacy. Overall, instruments of the treasury perform very well. The main challenge is to find the public funds to develop programs and distribute the benefits.

Nodality instruments are discernible by their very high flexibility and their low level of coerciveness, which makes them very popular, but which does not allow any guarantee of effectiveness. The effectiveness depends a lot on the incentives for the actors to voluntarily change their behavior. Because of their low costs, these tools tend to be rather efficient. All in all, these instruments are very advantageous and cannot be harmful for any project. They are best used to convoy or prepare the terrain before applying other, more effective instruments.

5. CONCLUSION

In concluding this report, a few unaddressed details must be briefly discussed. Although the range of instruments and an associated analysis has been provided, support will inevitably be needed in making instrument-choice decisions. For this reason, there will be a few brief comments on decision methodologies that might be helpful for policy-makers. Then, recommendations will be made for those who find themselves in the process of deciding on the type of instruments to use. Finally, since this report has focused on applications to river basins, there will be a brief attempt to generalize this report's applicability to other biospheres and subject areas.

5.1 Decision Methodologies

The challenge of instrument choice can, at times, be quite large. This is particularly the case when strong interests are of opposing points of view. In these cases, it is recommended that some scientific methodology be utilized in making this process more systematic. There are a range of decision methodologies available to decision-makers. Particularly in environmental cases, impact assessments can be carried out. This process can help to ensure that the outcomes of various decisions are as clear before the fact as possible. A similar instrument is cost-benefit analysis. Such a methodology can also serve as a useful medium to investigate the actual pros and cons surrounding instrument options. While a positive result can lead policy-makers in their decision-making process, it can also serve as a useful starting point for discussions among various actors and stakeholders on the desired course of action. Finally, when trying to decide between a range of options, multi-criteria decision analysis can be helpful. Such an instrument, particularly when utilized properly through decision conferencing, can be highly effective in bring a diversity of interests to consensus in divisive situations. Information on all of these methodologies and their use can be found in various areas of academic literature.

5.2 Recommendations

One of the most important recommendations that this report finds is to look for the possibility of combining instruments. When utilizing individual instruments, the effectiveness, as well as perhaps efficiency, may decline. When reinforcing zoning authority

with information, and assisting in the provision of subsidies through organizational restructuring, some instruments have a better chance of success.

The second recommendation is to consider the sequence of instrument implementation. Moving from least to most coercive instruments may be helpful in raising awareness and public support for resettlement efforts. While this does not necessarily have to entail movement through the instrument classification system from nodality to authority, public information campaigns, for example, are certainly recommendable as a first step in altering population living patterns.

A large amount of experience in moving populations can be won by looking at non-traditional resettlement schemes. For example, residents have been moved from dilapidated to newer low-income housing in American inner-cities, and the Israeli government has successfully moved entire communities from less politically-acceptable to more-acceptable areas through a variety of measures. While these examples do not have anything to do with climate change, they can be very useful. The experience from these processes, as well as the many other possible examples, should be sought and utilized in considering options for the future of resettlement.

Next, policy makers should be prepared for windows of opportunity. For example, when considering the upcoming EU Flooding Directive, there is the opportunity to utilize multi-national policy creation to put resettlement on local agendas. Support in this process can be found in the variety of national adaptation plans that sometimes mention the future need for societies to adapt to the global changes in climate. While resettlement may not be mentioned explicitly, the opportunity for reference and usage can exist. This includes not only seeking quality methods of resettling, but in a first step methods to prevent continued development in endangered areas, whether through free-market decisions or—worse—through hidden governmental subsidies. In general, being proactive, instead of reactive, will benefit all of society.

Finally, there should be no illusion that there is a one-size-fits-all policy instrument or combination. Each local or regional situation will be unique, and most decisions will have to be tailor-made to local situations. Looking at examples, near and far, is a salient part of the instrument-choice process; however, making sure that these instruments fit within the local context will be of utmost importance in each case.

5.3 Generalizability

As we have stated in the outset of this paper, climate change affects every geographical area and all kinds of different biospheres found in them. We have for this project concentrated on efforts to adjust to the changes of precipitation and river flows induced by climate change. In our assessment we decided that for the least damages in the future and for achieving the most possible sustainable adjustment, the best alternatives were to “change the location” and “enhance adaptive capacity”¹¹⁴. Therefore we have considered the different instruments -within these boundaries- states, governments or communities have in their disposal when faced with such climate-change-induced flood risks.

Unfortunately, even using the same logic, the conclusions can be very different, depending on the areas we want to apply them. The two above adjustment options we considered for floodplains (i.e. location change and adaptation enhancement) might be applicable in, for example, coastal areas, however when dealing with disappearing biodiversity, our recommendations cannot be applied. Though the range of instruments might be similar, the initial logic of adaptation level (discussed on page 3) might have to be altered – solutions to the problem of disappearing biodiversity cannot profit from instruments that urge location change.

At the same time, river basin adjustment can possibly draw useful examples from developments and regulations in coastal areas. Interesting cases and options that also follow the same adjustment logic restated above have to be sought after and considered as possible examples for floodplains.

Furthermore, it needs to be noted that though communities might relocate, the adjustment of transportation infrastructure needs to be developed from a different perspective. Roads and bridges are there to stay in the case of any kind of floods. For that, relevant regulation, considering the possible risks associated with increasing occurrences of floods, have to be incorporated in their planning, building and development.

Applying the same logic from the other angle, agriculture could also adjust to seasonal farming at times when there is no flood risk. A comprehensive system and accurate amount of information for proper planning is mostly indispensable for making such an arrangement work.

¹¹⁴ See table on page 3.

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ANNEX: CASE FILES

Case Number: 1

Case	Finnish Flood Compensation
Country, location, year	Finland (2001)
Problem, event(s)	The Finnish government has innovative new legislation that provides less compensation for flood victims and, thereby, more incentive to live in non-flood-prone areas.
Responses, instrument(s)	Flood compensation is only provided in Finland when the flooding is considered to be 'exceptional', which means that the area can not have flooded in the past 20 years. Only a certain amount of money is reserved in the budget each year for compensation, and this fixed amount must be divided among all flood victims. The amount of compensation ranges from 40 – 80%, which prevents total compensation, and each case is investigated individually. Finnish insurance companies do not take liability in cases of flooding.
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	This case is innovative because it provides a national example of how to systematically reduce the burden that governments have in compensating flood victims for their losses. While this is probably politically difficult to achieve in most areas, it sends a strong signal to all home and business owners that they should be very careful when making location decisions. It could also encourage those in flood-prone areas to relocate on their own initiative. Such a case is useful in river basins, as well as in coastal regions.
Further documents and link	Sustainable water use in Europe (2001) Environmental issue report, No. 21, Copenhagen: European Environment Agency, p.83
Notes on search strategy	Perhaps there are other countries that have implemented similar legislation. Investigating the Finnish case further would be necessary.

Case Number: 2

Case	Lower Danube Green Corridor
Country, location, year	Bulgaria, Romania, Ukraine, Moldova
Problem, event(s)	Transfrontier river corridor
Responses, instrument(s)	Organization based instrument
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	<p>WWF used its credibility and expertise to broker a transfrontier agreement to give room to the Danube river. This agreement recommends the relocation or curtailing of human activities to free space to the floodplains.</p> <p>It shows that NGOs can use their expertise to engage governments to undertake 'win-win' strategy that will protect nature and the human settlement from recurrent floods.</p>
Further documents and link	<p>http://www.panda.org/about_wwf/where_we_work/europe/what_we_do/danube_carpathian/index.cfm?uNewsID=67080</p> <p>http://www.panda.org/about_wwf/where_we_work/europe/what_we_do/danube_carpathian/index.cfm?uNewsID=66620</p>
Notes on search strategy	Wwf Danube floods

Case Number: 3

Case	Making Space for Water: Developing a New Government Strategy for flood and coastal erosion risk management in England
Country, location, year	England, 9/2004
Problem, event(s)	Consultation on UK's government New Strategy for flood and coastal erosion risk management
Responses, instrument(s)	Government Reorganization through multi-stakeholder consultation
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	Consensus based instrument to secure acceptability and legitimacy for relocation and resettlement programs Government Reorganization
Further documents and link	http://www.defra.gov.uk/corporate/consult/waterspace/consultation.pdf
Notes on search strategy	Defra

Case Number: 4

Case	Resettlement in Israel
Country, location, year	Ganim and Kadim, Israel (2005)
Problem, event(s)	The Israeli government is in the process of resettling residents in Palestinian areas to Jewish settlements in other parts of the country. In this case, support has been approved to move 12 families “from Ganim and Kadim...to Gan-Ner in the Gilboa Regional Council area and to Afula.”
Responses, instrument(s)	<p>Settlers that move from such areas to ‘national priority areas’ are provided with loans of 135,000 ILS (ca. 24,000 EUR). These loans are turned into grants after the settlers have stayed in their new towns for at least five years. This is in accordance with the Evacuation Compensation Law.</p> <p>The law outlines conditions under which residents and businesses can receive compensation for resettlement. If eligibility criteria are not met, a special committee has the legal authority to grant or increase compensation to allow/encourage resettlement. This special committee includes members of the finance and justice ministries, as well as other public representatives.</p> <p>In order to administer the various cases of resettlement, the Israeli government has also established the Disengagement Authority.</p>
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	<p>The applicability of this case is that it involves the partial and/or complete resettlement of communities. While it does not have anything to do with environmental concerns, it nevertheless is a government response to a public safety concern. As the Israeli government supports resettlement to distance its citizens from ethnic conflict, other governments can utilize similar instruments mentioned above to distance its citizens/businesses from flood waters.</p> <p>The use of loans and/or grants to encourage resettlement is not new. However, the use of loans that encourage resettlement to ‘designated areas’ and that turn into grants to encourage the resettlement to these areas to become permanent is an novel instrument.</p>
Further documents and link	<p>http://www.mfa.gov.il/MFA/Government/Communiques/2005/Disengagement+Authority+approves+resettlement+loans+1-Jun-2005.htm</p> <p>Disengagement Authority approves resettlement loans - 1 Jun 2005 (Communicated by the Prime Minister’s Media Adviser)</p> <p>A special Disengagement Authority committee today (Wednesday, June 1, 2005), approved NIS 135,000 standing loans per family for 12 families from Ganim and Kadim, who are moving to Gan-Ner in the Gilboa Regional Council area and to Afula.</p> <p>Settlers who move to national priority areas in the Galilee and the Negev are eligible to receive these standing loans in accordance with the Evacuation Compensation Law. The loans become grants after five years in the new areas.</p> <p>The special committee has the legal authority to approve special payments, beyond the letter of the law, in those cases in which the eligibility conditions for receiving them have not been fulfilled, to approve moving communities, to increase compensation payments to businesses, etc.</p> <p>The Disengagement Authority wishes to emphasize that the above is not a sweeping decision and that each family request will be considered on its merits.</p> <p>Disengagement Authority Director Yonatan Basi chairs the special committee, which also includes Justice Ministry, Finance Ministry, and public representatives.</p>
Notes on search strategy	Do more searching for “Disengagement Authority” and “Evacuation Compensation Law” to find out more information and probably more cases.

Case Number: 5

Case	Great mid west floods
Country, location, year	United States, 1993
Problem, event(s)	Floods induce damages approximate \$15billion, loss of lives and demonstrated failure of traditional flood management techniques.
Responses, instrument(s)	Led to largest voluntary resettlement in US history with about 20000 Midwesterners evacuating their homes and relocation of 8000 homes and businesses
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	Instrument type: Organization and authority based instruments for resettlement Also an example of combined treasury and voluntary instruments (see link to Environmental Defense Fund) Bioregion is a river basin
Further documents and link	To read more about the Great Midwest case study, visit www.greencissors.org/water/floodcontrol.htm www.environmentaldefense.org/documents/594_FloodPolicy.pdf
Notes on search strategy	Great Midwest floods (also known as “Great Flood”)

Case Number: 6

Case	Hidden Subsidies concerning Flood Control
Country, location, year	United States (No date)
Problem, event(s)	“The U.S. Army Corps of Engineers (Corps) spends upwards of \$1 billion annually on flood-control construction and repair projects. Rather than reducing flood losses, however, the projects have increased the potential for even more severe flood damage. Many of the projects encourage high-risk development in flood-prone areas, reduce incentives for strong state and local floodplain management, and eliminate the natural and beneficial functions of floodplains.” –Green Scissors
Responses, instrument(s)	In this way, subsidies are used to actually make flooding a larger problem, since even larger sections of communities are placed in danger. Green Scissors recommends reducing the budget for the US Army Corps of Engineers, and they hope to reduce the percentage participation of the federal government in flood control projects.
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	Finding and removing negative subsidies is one of the primary areas where instruments of the treasury can have the most efficient impact. While other instruments typically require more financial investment, removing subsidies can actually save a government’s money while helping it to achieve its overall goals. This should be an example for governments in all contexts to search for such policies and try to remove them from legal books.
Further documents and link	http://www.greenscissors.org/water/floodcontrol.htm
Notes on search strategy	There are plenty of examples of hidden or unwanted subsidies. Looking more at the information provided by Green Scissors might be useful.

Case Number: 7

Case	“Hydrometropole”: Future Resettlement from Land to Water?
Country, location, year	Naaldwijk, Netherlands (2005-Present)
Problem, event(s)	<p>The Netherlands is a country that has a lot of experience struggling with high water levels. While its coastal and riverside lands are well protected through an extensive network of dikes (being prepared for 10,000 year floods), the country is still planning for long-term development sustainability into the 22nd century. Their potential solution is called ‘climate proofing’. This approach focuses on infrastructure development, accompanied by ‘soft’ insurance measures and evacuation plans.</p> <p>Two cases of climate proofing are proposed: Resettlement from low-lying western areas to higher and drier eastern areas. Hydrometropolises could be created. In theory, these could be large, urban, industrial (or even rural) areas that are partially floating on or surrounded by water.</p>
Responses, instrument(s)	Research projects were funded and implemented. The current phase is pilot projects.
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	The applicability of this case is that it could provide a future for agriculture (and even human resettlement) despite the presence of water. It would be flexible enough to accommodate flood levels as well as droughts.
Further documents and link	www.waterandclimate.org/news/Documents/Nature_Kabat%20et%20al.pdf More information on floating greenhouses in the following report (Conclusions) www.spliet.nl/Report%201%20screen%20optimized.pdf
Notes on search strategy	Perhaps this risk institute site provides more information.

Case Number: 8

Case	Post-Hurricane Floyd & Partial Relocation of Kinston, NC
Country, location, year	Kinston, North Carolina, USA (1999-Present?)
Problem, event(s)	<p>Kinston, NC was hit hard by Hurricane Floyd. This event was part of a series of hurricanes and tropical storms that saturated the ground along the Atlantic coast and produced flood waters. The Neuse River crested at 10 feet above flood level. Three-quarters of the homes in the flood plain were severely damaged.</p> <p>As a result of the devastation, the city decided to incorporate risk management and flood plain management tools into their community toolbox.</p>
Responses, instrument(s)	<p>The city decided to use Geographical Information Systems to map the areas of the city that were susceptible to 100 and 500-year floods.</p> <p>A home acquisition initiative was started with help from FEMA's Hazard Mitigation Grant Program (HMGP). This program has provided a total of \$30 million to purchase 75% of homes in flood plains. The other 25% must be invested by communities, individuals, or organizations. At least 1,000 homes have already been bought out, and approximately 225 are scheduled to be purchased.</p> <p>The relocation program helped minimize the tax-base loss to the community by assisting homeowners in buying or rebuilding within areas of the city on higher ground.</p> <p>A state relief fund provided \$1,500,000 for the purchase of construction materials to build new homes. Around 100 homes will be partially financed with these funds.</p> <p>Community action groups were set up to recruit volunteers for reconstruction and resettlement efforts. Thus, civil society has played a notable role.</p> <p>Existing structures have also been utilized. An abandoned school has been converted into housing for senior citizens.</p> <p>Zoning was used to convert previously-residential properties into community green space.</p>
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	<p>The applicability of this case is that it involves the partial resettlement of a community.</p> <p>The bio-region is applicable because Kinston is located in the Neuse River Valley.</p> <p>The use of economic instruments in rebuilding the community is also important. Creative strategies can also be drawn out of this case, for example the adaptive reuse of a former school into senior citizen housing. This process has, thus, used resettlement as a way to reuse vacant buildings.</p>
Further documents and link	<p>http://www.riskinstitute.org/FP_DOCS/floodplain.pdf</p> <p>Innovative Floodplain Management</p> <p>FEMA Mitigation Case Studies</p>
Notes on search strategy	Perhaps this risk institute site provides more information.

Case Number: 9

Case	Missouri Buyout program
Country, location, year	US, Missouri
Problem, event(s)	1993 floods
Responses, instrument(s)	Government occasioned a buyout program
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	Government had to buy out property in flood prone region in order to facilitate resettlement. Shares same bioregion: river induced flood Instrument type: organization & treasury
Further documents and link	www.fema.gov/mit/cb_aqres.htm
Notes on search strategy	Missouri buy out program

Case Number: 10

Case	Moos village resettlement
Country, location, year	Germany, Bavaria
Problem, event(s)	<p>The little village was flooded three times in the last decade: in 1999, 2002 and 2005. To avoid further damages, there are two possibilities: a dyke encircling the village, or resettlement. By now, the villagers seem to prefer resettlement, and are ready to move to a close State own area.</p> <p>But the costs stay problematic: who pays how much? The department is ready to pay 65% of the value of the houses which are left: but this is not enough, as this value is much reduced after 3 floods. The commune, which is quite small, doesn't have the capacity to pay the rest.</p>
Responses, instrument(s)	resettlement
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	<p>Show the actuality of the resettlement problematic (introductory chapter) for European regions.</p> <p>The cost sharing problematic is illustrated in the case. Even when the resettlement is "voluntary", it is expensive and needs help from departmental or national funds. > We could propose states to prepare a resettlement procedure including the cost matter.</p>
Further documents and link	<p>Only in German:</p> <p>http://www.dradio.de/dkultur/sendungen/laenderreport/427773/</p> <p>http://de.news.yahoo.com/17032006/336/dorf-flieht-hochwasser.html</p> <p>http://www.neuburg-schrobenhausen.de/aktuell/akt01.php?nr=2006036.txt</p> <p>http://www.bayern.de/lfw/iug/info.html</p>

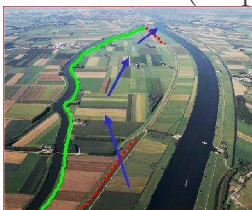
Case Number: 11

Case	Living River Plan
Country, location, year	Napa River, USA (1998)
Problem, event(s)	Stakeholders of the Napa river banded together to produce a non-structural alternative proposal based on free more space for the Napa river. The plan also led way to the voluntary relocation of homeowners and businesses along the floodplain
Responses, instrument(s)	Reorganization through multi-stakeholder consultation
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	NGOs can use this success story to challenge structural floodplain management paradigm and build a case for reform of disaster management agencies. USA
Further documents and link	http://www.environmentaldefense.org/documents/577_napariver.html

Case Number: 12

Case	Post-Hurricane Katrina Flooding in New Orleans
Location, yr	New Orleans, Louisiana, USA (2005)
Problem, event(s)	Hurricane Katrina hit the area of the Mississippi Delta where the City of New Orleans is located. The city's system of dikes was not strong enough to withstand the high waters, and dikes were breached in the days after the hurricane. Flooding was at various levels, but some neighborhoods, like the Lower Ninth Ward, were completely devastated. Decisions must be made concerning the location of reconstruction efforts. Some geographic factors are available, which help make this decision, but demographic segregation in the city make the problem of deciding what groups/neighborhoods are resettled a politically challenging one.
Responses, instrument (s)	<p>The Mayor, Ray Nagin, formed a commission, Bring New Orleans Back (BNOB), to plan reconstruction/recovery. Timeframe was given until May 20, 2006, for residents to commit to return and rebuild. If this does not happen, the government will pursue a direct 'buy out'. Bought land will be converted into parkland/green space or reverted to swampland.</p> <p>City service provision is an important instrument in this case. Police, water provision, street maintenance, and care of public land are all areas that receive heavy public subsidies. With a decreased population, as well as a corresponding decrease in tax base, decisions will be necessary about where to continue such service provision and where to stop it.</p> <p>The federal government has offered to provide some capital investment to improve infrastructure. Specifically, several new water pumping stations will be constructed along Lake Ponchartrain, a large local body of water, and three drainage canals will be closed. These are direct infrastructure subsidies.</p> <p>Zoning is a necessary instrument in this case, although implementing zoning is proving very difficult. Some parts of the smaller city will have to be condemned, but the decision has not yet been made which areas will be saved. This could serve as an economic instrument to encourage private reinvestment, but the lack of decision is causing widespread hesitation throughout the private sector.</p> <p>Direct regulation has already been used in the case of building moratoria. Some building permits have simply not been approved and will not be until decisions on future zoning have been made.</p> <p>Direct government action has been proposed by Richard Baker, R-LA, who wants the federal Congress to create a recovery corporation that will oversee the buy-out of private homes in the area. This corporation would, if created, be able to issue \$30 billion in public bonds to finance buyout.</p>
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	<p>The applicability of this case is that it is the most famous, recent example of a large population migration (in a western, developed country) in response to flooding. Looking at this case can help to provide insight into the needs and means of resettling populations, particularly urban ones.</p> <p>The problem is applicable because New Orleans is built upon a flood-prone alluvial plain. Many other cities of varying size are also residing on lands in river valleys that could face similar difficulties should river levels continue to rise, or should natural disasters cause the demise of protective barriers.</p> <p>This case has bio-regional significance because of its location on the Mississippi River. Of course, New Orleans also lies near the coast of the Gulf of Mexico, but it was the river dikes that burst and caused the massive flooding.</p> <p>The variety of instruments used in this case is also significant when considering the range of instruments available to policy makers following flooding.</p>
Further documents and link	<p>http://www.economist.com/displaystory.cfm?story_id=5417123</p> <p>The Big not-quite-so-Easy - Jan 19th 2006 NEW ORLEANS</p> <p>The Economist 'A smaller, safer New Orleans makes sense. It may not come to pass</p>
Notes on search strategy	The Economist provides a good description of instruments in its articles. Other articles could be sought that involve some sort of resettlement—perhaps even Israeli resettlement from Gaza or the West Bank.

Case Number: 13

Case	“Overdiepse Polder” project
Country, location, year	The Netherlands, North Brabant region, ongoing
Problem, event(s)	As sea levels have risen due to climate change, the discharge of the Meusel river has significantly increased, which started to threaten farmlands in the area and to pose a risk for humans settling behind the dykes.
Responses, instrument(s)	Very new approach, instead of raising dykes, they decided to “widen the river”.
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	<p>The case is applicable, since it shows us possible reactions to climate change induced flood risk.</p> <p>In order to give space to the river to expand, the community decided to relocate farms (see picture).</p>  <p>It was done through strong involvement of local people in the project (initiative actually came from the locals).</p>
Further documents and link	http://www.waterland.net/index.cfm/site/Waterland.net/pageid/20F10368-1805-4CB2-847A9021E4E39BD3/newsid/13608638-D72C-865A-D1FC7BEFB9CED71E/index.cfm
Notes on search strategy	Further search could reveal the actual state of the project, whether it is a seasonal adjustment and how farmers can use their previous lands if it is seasonal. The issue of where to relocate and who is responsible for possible losses in output – if there is any, due to the quality of the new land – needs to be looked at as well.

Case Number: 14

Case	Plan Loire
Country, location, year	France, watershed of the river Loire, original plan 1986 which has been greatly altered and launched in 1994
Problem, event(s)	Flood control was suggested through the building of new dams in 1986, which started the so-called “SOS Loire Vivante” movement (mainly by WWF). The new policy is rather information for the population and keeping people away from settling in the floodplains of the Loire.
Responses, instrument(s)	<p>(Excerpt from the Plan Loire site:)</p> <p>“Ensuring security of the Loire valley’s residents in case of floods The security of the Loire valley’s residents is a priority of the Plan Loire. Increased settlement in the floodplains has created unacceptable risks, made worse by poor riverine management practices. Bad upkeep of the riverbed has increased these risks.</p> <ol style="list-style-type: none"> 1. Identifying the risks Education of local populations will include the publication of maps which show high-risk areas, along with flood protection advices and evacuation plans. 2. Controlling urbanization Further expansion of human habitation in the floodplains will be strictly supervised and will be forbidden in the most dangerous areas.”
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	<p>This case illustrates possible action for the mitigation of flood risks or damages that are incurred by floods.</p> <p>The main tool is awareness-raising, together with controlling urbanization.</p>
Further documents and link	http://www.rivernet.org/loire/plgn.htm#INTRODUCTION http://www.rivernet.org/loire/soslv/soslv.htm
Notes on search strategy	Necessarily, the effectiveness of such campaigns has to be researched before making assumptions.

Case Number: 15

Case	Research Triangle Park (RTP)
Country, location, year	Raleigh-Durham, North Carolina, USA (2004)
Problem, event(s)	The North Carolina government designated 7,000 acres of land between the cities of Raleigh and Durham as the location for a large research and technology park. The purpose of this was to utilize economies of scale to attract resettlement of business to this area from other areas.
Responses, instrument(s)	The land was zoned for purchase and development by private enterprises in a variety of science and technology-oriented fields. Tax incentives were and still are provided to encourage development. No development taxes were charged, and special infrastructure was provided to make the location more attractive. Particularly helpful is the location adjacent to the regional airport. Furthermore, public information and marketing is provided state and nationwide to encourage resettlement to RTP.
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	The applicability of this case is the use of various instruments to affect location decisions. First, the authority instrument of zoning was key in making this land a special zone for development. Then, the treasury was utilized by doing without various local taxes. Finally, public subsidies were provided in the form of infrastructure investment, not only through airport proximity, but also through freeway access. The case is also important due to the innovative approach taken to coordinate multiple layers of government to achieve common goals.
Further documents and link	www.rtp.org Fact Sheets are available concerning the size and diversity of this project.
Notes on search strategy	Other cases can be found for combining instruments and affecting location decisions in the area of business and technology parks.

Case Number: 16

Case	Impact Fees
Country, location, year	United States (1992)
Problem, event(s)	Some state legislatures in the United States have passed legislation to develop user charges for land.
Responses, instrument(s)	While user charges are typically not connected with land development and usage, a very similar instrument has been developed in the United States. Impact fees place a charge on the development and usage of land. It is typically done to help governments to pay for the development of appropriate infrastructure.
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	Impact fees are typically for the purpose of reducing the burden of development on governments. While this is usually done to decrease overall infrastructure costs due to development, they could also be used to discourage development in flood-prone areas and to set up funds for the collection of risk capital. Such an instrument, where legally feasible, could be utilized in a wide variety of settings.
Further documents and link	http://www.ncsl.org/programs/fiscal/fpufmain.htm
Notes on search strategy	Impact fees are utilized in dozens of US states. Specific examples can be found through a variety of sources.

Case Number: 17

Case	Tax Increment Financing
Country, location, year	United States (2003)
Problem, event(s)	The financing mechanism called TIF (tax increment financing) has been a solution to some problems, and it has caused other problems, as well. The purpose of the instrument was to revitalize blighted urban areas. The problem is that it has been abused as a negative subsidy for development in flood plains.
Responses, instrument(s)	Tax increment financing designates a zone where property taxes are frozen at certain levels. This freezing, potentially combined with other instruments, encourages private investment in these areas. As the value of these areas increases, no higher tax rates are required of property owners. The problem of abuse includes the interpretation of 'blight' to include areas that have been subject to past flooding. Instead of encouraging resettlement, the instrument sometimes encourages development in flood-prone areas. This has, to some extent, been identified and is being addressed.
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	The many cases of TIF zones show how instruments that combine authority and treasury can direct development to certain areas. It could be relevant as an incentive for attracting people and businesses away from flood-prone areas. The applicability is also shown through the need for getting rid of hidden subsidies that counteract resettlement efforts. The way that this type of policy is administered and enforced must be reviewed to ensure that negative outcomes are not produced.
Further documents and link	Luce, T. (2003). "Reclaiming the Intent: Tax Increment Finance in the Kansas City and St. Louis Metropolitan Areas" Discussion Paper prepared for the Brookings Institute.
Notes on search strategy	There are plenty of examples of how TIF can be used in positive and negative ways to achieve location-decision goals.

Case Number: 18

Case	Post-Great Flood of 1993 Relocation of Valmeyer, Illinois
Country, year	Valmeyer, Illinois, USA (1993-1996)
Problem, event(s)	<p>The Great Flood of 1993 had a great impact upon the Mississippi River Valley. Valmeyer, Illinois was a small community of approximately 900 residents located ca. 25 miles south of St. Louis, Missouri. The dike protecting the village burst on August 1, 1993, and the river filled the community. The community was under water for two months, and, in the end, about 90% of the towns buildings were destroyed beyond repair. In total, about 2,500 people were affected, because another 1,600 people were living in the farmland around the town.</p> <p>The decision was made to resettle the population to higher ground. The new town included, as of December 1996, 115 single-family homes, 24 senior citizen apartments, a school, government offices, and various businesses. The population of the new town was 450, and construction was continuing in the late 1990s.</p>
Responses, instrument(s)	<p>A trailer-village was first set up in by the Federal Emergency Management Agency (FEMA). This provided immediate housing for many displaced residents. The county's regional planning committee decided to rebuild the agricultural infrastructure and to relocate the community itself. Valmeyer would be rebuilt on a 500-acre piece of land on a nearby bluff over the river. The federal government provided subsidies through the Department of Energy's Office of Energy Efficiency and Renewable Energy, which helped the community to be rebuilt in an energy-efficient manner.</p> <p>Technical expertise was provided in the form of a Sustainable Redevelopment Team, which worked closely with town officials and residents on utilizing sustainable technologies and materials.</p> <p>Grants of \$1,700 were provided by the Illinois Department of Commerce and Community Affairs to residents who were willing to rebuild using resource efficiency technology.</p> <p>A grant of \$36,000 was given to the developer of the senior citizen facility also to incorporate efficient technologies in the building design.</p>
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	<p>The applicability of this case is that it involves the complete resettlement of an entire community, albeit a small one.</p> <p>The bio-region is applicable because Valmeyer was and is located in the Mississippi River Valley.</p> <p>The use of economic instruments in rebuilding the community is also important. This is particularly the case because the subsidies encouraged sustainable development and the use of alternative energies.</p>
Further documents and link	<p>http://freshstart.ncat.org/case/valmeyer.htm</p> <p>Operation Fresh Start</p> <p>Using Sustainable Technologies to Recover from Disaster</p> <p>For more on this case, a master's thesis by Jack Rozdilsky, who chose Valmeyer as the topic of his 1995 masters degree thesis, can be found by doing a Google search. The thesis is titled "Flood-Related Relocation, Sustainable Redevelopment, and Alternative Energy: Planning Recommendations for the Use of Wind Energy in Valmeyer, Illinois."</p> <p>The above website also has similar cases of other small towns that were relocated following floods.</p>
Notes on search strategy	There are other communities like Valmeyer that were also resettled after the Great Flood. Perhaps other communities have different tools that they used.

Case Number: 19

Case	Resettlement Action Plan : Odra River Basin (ORB) Flood Protection Project
Country, location, year	Poland, around Wroclaw 2005/08/01
Problem, event(s)	Reaction to very destructive 1997 flood The official document delineates the whole resettlement procedure planned, including: Background, problem, project outline, public consultation and participation, Polish law and World Bank policies, monitoring and evaluation, compensations, voluntary and involuntary resettlement, resettlement into a new village built for this occasion, allocation of responsibilities... (see summary)
Responses, instrument(s)	Resettlement
Applicability, Relevance (to problem of climate change induced need for adaptation in river basins)	Fully applicable climate induced floods in river basin resettlement
Further documents and link	http://www-wds.worldbank.org/servlet/WDS_IBank_Servlet?pcont=details&eid=000012009_20051110131710
Notes on search strategy	By typing flood resettlement into www.google.de. It's the 7th link...