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**Adaptation to climate change:
*A challenge of integration***

Theoretical introduction : Climate policy integration

The concept of *climate policy integration* (CPI) has recently appeared in policy and scholarly discourse. This is ensuing from the *environmental policy integration* approach that emerged in the 1990s with the aim to embed environmental concerns into all policies (Jordan and Lenschow, 2010).

CPI is defined as the integration of the climate change dimension into all areas of policy making (Urwin and Jordan, 2008) or, more particularly, as:

*“• the incorporation of the aims of climate change mitigation and adaptation into all stages of policy-making in other policy sectors (non-environmental as well as environmental);
• complemented by an attempt to aggregate expected consequences for climate change mitigation and adaptation into an overall evaluation of policy, and a commitment to minimise contradictions between climate policies and other policies.”* (PEER, 2009, p19)

CPI can be divided into horizontal and vertical policy integration:

- Horizontal policy integration (HPI) or mainstreaming (Ahmad, 2009) refers to *“cross-sectoral measures and procedures by the government undertaken in order to mainstream or bring about a comprehensive integration of climate change mitigation and adaptation aims into public policies”* (PEER, p20)
- Vertical policy integration (VPI) refers to *“the integration of climate policies into a specific sector. It includes sector-specific strategies and decisions made at ministerial level, as well as the integration of climate policy into the strategies, measures and actions taken by different agencies under the supervision of a ministry. Vertical policy integration can be assessed at just one level, but it also refers to integration throughout many levels (i.e. national state, state, region, local). Thus, vertical policy integration across levels refers to the integration of climate policies over different levels of policy making according to multi-level governance approaches”*. (PEER, p22)

In this paper, we use the concept of CPI to analyze the integration of the aims of climate change adaptation into external policies such as development aid and regional policy making.

In a first part, we analyze the advantages of the CPI regarding the integration of climate change adaptation within development aid. Two different approaches of integration will be studied. The first approach is not related to the CPI. It is a sectoral approach of adaptation as it proposes to elaborate projects for developing countries that specifically address climate change adaptation. Those projects are elaborated as a specific sector within development aid aimed at adaptation. This approach will be briefly exemplified through Napa¹'s. The second approach is linked to the CPI in its horizontal form. This approach intends to integrate adaptation within existing development projects, in order, not only to address climate change issues, but also other socio-economic vulnerabilities. This mainstreaming of adaptation is a comprehensive integration of climate change adaptation into development policies.

Both approaches have already been at the core of many studies. Rather than analyzing them on a theoretical background, we will use field study results in developing countries (from literature and from our own work) to illustrate and evaluate those approaches.

In a second part, we introduce several research questions, in a CPI perspective (both at the horizontal and vertical level), related to the implementation of a regional adaptation plan. The Walloon Region in Belgium has been chosen as study case. Contrary to the first study case presented in this paper, we are only in the beginning of the research project related to the Walloon adaptation plan. Results related to our research questions are thus not yet available in this stage.

1) Sectoral and mainstreaming approaches to integrate climate change adaptation within development aid

In this point we will introduce two different ways to implement adaptation within developing aid policy. The first approach is sectoral as adaptation issue becomes a specific sector of action within development aid. The second one is based on a mainstreaming of adaptation and integrates this issue within all development concerns.

In order to evaluate both approaches we will propose the use of field results on climate change adaptation researches in Africa. We will therefore exploit field study results found in literature on climate change adaptation as well as our own fieldwork in rural Benin. The framework we used in our work will be described; it is based on the concept of vulnerability, used in natural disaster studies and in some current adaptation studies.

We finally draw our conclusions using field results in order to evaluate, as part of development aid policy, the sectoral and mainstreaming approaches of climate change adaptation.

1.1. Introduction to both approaches

We will first present the sectoral approach through the example of Napa's, which consists of adaptation projects supported by the IPCC for the Least Developed Countries. It will be compared to the mainstreaming approach (horizontal CPI), which is, in our opinion, a more global approach of adaptation, that takes into account other issues than climate change.

¹ National Action Plan for Adaptation

Napa's are linked to the sectoral approach because their projects are elaborated as a specific sector aimed at adaptation within development policy. This is suppose to bring more clarity on what is done for adaptation in developing countries, and how much money is given to this issue.

Napa's projects try to adapt some developing countries essential sectors (such as water or agriculture) to current climate change impacts. Therefore, the projects can also be seen as cross-sectoral (since they deal with main sector's weaknesses linked to climate change). Since the main goal of the projects is to adapt a sector to climate change impacts, we consider them as a new sector of action within development aid rather than a cross-sectoral approach.

Projects focus on current and critical needs, which are determined by firstly highlighting the vital sectors of a country. On the basis of climate change impacts, the sectors vulnerabilities are underlined and impacts on population are afterwards assessed: for instance, in Benin, agriculture is very vulnerable to climate change. Its effects on this sector will have several consequences on population such as rural exodus or increased food prices. Therefore, adaptation options are needed, and they are proposed for the vulnerable sector, based on existing adaptation strategies.

Adaptation projects resulting from this method are elaborated as a sector separated of other development issues and are designed to reduce short-term vulnerabilities of sectors. This method could be criticized on several points. Causes of people's vulnerability on a particular sector are not searched and solved. Reducing vulnerability of agriculture to drought, for instance, by setting early warning systems, will not necessarily imply that people themselves will be less vulnerable if the information is not well understood by all, or if farmers have no means to be concretely prepared for drought.

The link between adaptation and other development issues, illustrated through the mainstreaming approach, has been recognized by several authors and institutions (Stern N. (dir.), 2007 ; Enda, 2007 ; Oxfam, 2008 ; Klein R., *et al.*, in European Parliament, 2008 ; Peskett *et al.*, 2009 ; Banque Mondiale, 2009). However this link is not always taken into account in specific adaptation projects. Also, responses to current climate stresses might become irrelevant as new changes in climate occur or due to climate forecast uncertainties.

In order to avoid those two slants, we believe that mainstreaming adaptation within development issues offer a more global approach to deal with climate change impacts on people. The approach focuses on people rather than sectors or climate stresses in order to deal with the causes of people's vulnerability to climate change. As for the horizontal CPI, we believe that it is a comprehensive integration of climate adaptation aims within all development policy.

Authors or institutions and NGOs (Enda, 2007 ; Oxfam, 2008 ; Adger N., *et al.*, 2001; Leary N., *et al.*, 2008) in favor of this approach often underline the fact that climate change impacts are not necessary the cause for vulnerability. Addressing other development issues, such as access to food and income or education, is a better way to make people more resilient to climate change than addressing climate change impacts on sectors directly. Mainstreaming adaptation within development policies is a way to deal with several socio-economic vulnerabilities which often lead to climate change vulnerabilities.

In the next point, we will face both approaches of adaptation with field reality through studies found in literature as well as with our own fieldwork among rural farmers in southern Benin.

1.2. Field study of adaptation and its outcomes

We studied several rural communities in Benin during our PhD in order to understand the needs regarding climate change adaptation. While performing our study we combined two different approaches in order to analyze adaptation needs:

- 1) The study of vulnerability as done in natural disaster studies (cf. Blaikie P., *et al.*, 1994)
- 2) The study of climate change vulnerability and adaptation as found in Dube O.P., *et al.*, Dabi D., *et al.*, Chinvanno S., *et al.*, in Leary N., *et al.*, 2008 ; Paavola J., in Adger N., *et al.*, 2006; etc.

In their study of natural disaster Blaikie *et al.* (1994) define the risk of a disaster (R) as the combination of *hazard* (H) and the *vulnerability* of a *system* (V)² :

- the *hazard* is a natural event that create the risk of a disaster
- the *system* is the natural and social background made of complex links and interdependency
- the *vulnerability* is the characteristics of people or society that determine their capacity to anticipate, manage, resist and recover from the impacts of a natural disaster

A system is vulnerable to natural disaster due to the natural hazard, as well as to its biophysical, social, cultural, political and economical characteristics. To decrease vulnerability the authors propose to understand the deep roots of vulnerability, which are studied through PAR³ model. This model sets apart the hazard from the causes of vulnerability, which are explained at three different levels:

- Deep-root causes, found, at a global level, in political or economic structure and process of the system
- Dynamic pressures which come, at the regional and local level, from the weakness of local institutions, difficult access to resources, demographic pressure or land degradation
- Insecurity due to settlement location, a fragile ecosystem, weak incomes, etc. The dynamic pressures channel the root causes into specific forms of insecurity at the local level

In their study, Blaikie *et al* underline that it is necessary to act on the three levels of causes as well as on its multiple aspects (individual, physical, social, cultural, etc. characteristics of a system) in order to decrease natural disaster vulnerability.

In our own study of climate change adaptation in Benin, we use this approach combined with recent studies on climate change adaptation. Those studies rather focus on people and their living context than on climate change impacts per se in order to study the causes of climate change vulnerability. This approach can be found for instance in the work of Adger *et al.* (2006). In their study authors underline three components of a system that determine its vulnerability to climate change :

- Its exposure, which is the current biophysical situation of the system, as well as future climate change
- Its sensibility to climate stress, how it is already affected by current climate stresses, due to social, cultural, economic, etc. characteristics

² The formula $R = H \times V$

³ Pressure and release model

- Its adaptive capacities, which are the means available to face present and future climate change

In this model, as well as in natural disaster study, vulnerability to climate change depends on the social, political, economical or cultural characteristics of a system that determine its sensibility and capacity to cope with climate change. Therefore adaptation cannot be considered as a sector separated from those issues.

Authors situated within this thought describe their field context in three components: its climate change exposure through biophysical factors such as location, current and future climate and climate stresses, type of soil, etc.. Its sensibility and its adaptation capacities through socio-politic, economic, or cultural indicators, such as gender, main economic activities, income, access to input or market, etc. This approach underlines several relevant factors of climate change vulnerability in the context of developing countries rural area. Those factors may be land property, diversification of activities, income, or available labor. They underline where actions should be taken in order to decrease climate change vulnerability and we may see that it usually comes to general development concerns, such as rural development, strengthening of local institutions, or access to input in order to increase productivity. However, other actions specifically aimed at climate change (such as information and training or early warning) will also be necessary.

By adding Blaikie's PAR model to this kind of study, our own work in Benin also underlines the multi-level causes for climate change vulnerability at the village level. The framework (which will be explained during the oral presentation) highlights the socio-economic causes for vulnerability to climate change and provides an idea on their national, regional and local causes. In the case of Benin, for instance, weak national investment in crop field, or few financial and human resources for the local authorities can also explain local climate change vulnerability.

The results from literature and from our field research show that socio-economic vulnerabilities can explain climate change vulnerabilities, which are not directly linked to natural hazard. Therefore a mainstreaming approach of adaptation would be more appropriate than a sectoral one, which approach wouldn't take into account the several dimensions and deep-root causes of climate change vulnerability as well as the uncertainties on future climate scenarii. Indeed it appears that reducing climate change vulnerability will also imply acting on different socio-economic weakness, at different level. Setting a specific sector for climate change adaptation could deny this necessity.

1.4. Conclusions

Our work addresses the question of how to integrate climate change adaptation through development aid policy, which is a quite central issue in international politics and development institutions today.

We firstly described two different approaches of the question. The first one can be found in Napa's and is a rather sectoral approach of climate change adaptation. This issue becomes a specific sector within development aid, separated from other development issues (a specific sector for adaptation). Projects focus on climate change impacts on main sectors in order to suggest adaptation action and the natural hazard is seen as the main cause of people's vulnerability.

The second approach integrates adaptation within development policies (CPI mainstreaming), which is often stimulated by international institutions or NGOs such as the EU, the World Bank, Oxfam or Enda. In this approach, climate change issues should be integrated within development projects because they are deeply linked together.

Both approaches (sectoral and mainstreaming) were faced with results from literature and our own field studies. Those results show that the focus should be on socio-economic vulnerabilities at the local level as factors on which to act in order to decrease vulnerability to current and future climate change. Combining the study of climate change vulnerability with Blaikie's PAR model, we underline the fact that adaptation could be implemented through social, economic or institutional actions, at the local, regional and national level rather than taking climate change impacts on a sector as the core of a project (such as Napa's).

Development projects can already favor adaptation by decreasing socio-economic vulnerabilities. However we recognize that actions linked specifically to climate change will also be needed as climate change becomes more apparent (actions such as climate information through radio, training and preparedness, climate insurance, etc.). Integrating climate change adaptation within development aid is a way to decrease the socio-economic causes for people's vulnerability, making them more resilient to future and uncertain climate change, but it will also be necessary to give them a new set of knowledge and weapon to face future climate risks.

2) CPI and the implementation of a regional adaptation plan

In response to climate policy impacts, the European Commission's "White Paper on adaptation to climate change" recommends implementing adaptation strategies, at the European, national and regional levels (EC, 2009). Around ten European Union countries and thirty regions have adopted such strategies or plans (PEER a, 2009; Ribeiro et al, 2009). In Belgium, a national and (Flemish and Walloon) regional adaptation plans are planned for 2012.

In the Walloon Region, a "Walloon network on adaptation" has been set up since end 2008 to prepare the regional plan. It gathers representatives of vulnerable activity sectors to climate change (e.g. air, agriculture, forestry, biodiversity, water (groundwater & surface water), health and country planning) and is coordinated by the *Walloon Agency for Air and Climate*, responsible for the preparation of the Walloon adaptation plan. The objectives of this network are 1) to exchange information on adaptation issues on different levels (from regional to international) between different sectors 2) to coordinate the Walloon position to adaptation issues and official reports and 3) to guide reflexions on the future adaptation strategy (Hoyaux, 2009).

The preparation of the Walloon regional adaptation plan raises several research questions that are related to CPI.

Firstly, we wonder if this plan could be a useful policy instrument to embed climate change adaptation into sectoral policies (**horizontal climate policy integration**). In the environmental field, plans (for example plans for waste management or air quality) are indeed considered as mainstreaming- or integration- tools because they gather different sector-based policies around a common objective (PEER a, 2009; Haughton et al, 2004).

In the Walloon Region, several policy measures related to climate change adaptation already exist (for example "Plan PLUIES" in the water sector/ flood risks or the "plan vagues de chaleur et pics d'ozone" in the health sector) but these latter are not coordinated through a common guiding instrument. On the other hand, other sectoral policies have not yet integrated adaptation concerns, namely because climate change impacts are not sufficiently foreseen (particularly at the regional or local level).

The Walloon adaptation plan, through its cross-sectoral nature, could thus be viewed as an attempt to better integrate adaptation in all concerned sectors and to search for synergies between sectors. Indeed, the composition of the Walloon network on adaptation corresponds to this objective. Furthermore, the Walloon plan is clearly envisaged to be linked with existing sectoral plans, namely the mentioned “Plan PLUIES” or the “Plan air-climat”, what supposes a policy coordination process.

Secondly, the implementation of a regional adaptation plan raises the question of its linkages with the national plan and the other policy instruments at national and European levels that address adaptation to climate change (**vertical climate policy integration**). Indeed, while regional or local levels are often considered as the appropriate scale to put in place adaptation measures (Lowe et al, 2009 ; Ribeiro, 2009 ; Sovacool and Brown, 2009), vertical integration with the other policy scales is needed to insure coherence.

Finally, the preparation process of the plan can be examined under the angle of the participative dimension of integration. Indeed, adaptation is made up by actions led by public and private actors, i.e. individuals, groups and governments (Adger et al., 2005). Therefore, participative approaches can contribute to the integration process by several means, namely the identification of the most appropriate adaptation measures and of the priority areas and the mobilization of stakeholders’ knowledge and experiences on local vulnerabilities and impacts (PEER a, 2009).

If such a (large) participative approach is envisaged for the preparation of the Walloon adaptation plan, then we can analyse if and how “adaptation strategies” already implemented by the actors on the field - for example enterprises from the different activity sectors- will be integrated in the regional plan. These policy-led and stakeholder-led adaptation approaches and their mutual interactions constitute a central element to implement a “successful” adaptation practice.

In conclusion, while there are still no accepted methods for achieving CPI or even for undertaking this sort of policy analysis at single or across a variety of interconnecting spatial scales (Urwin and Jordan, 2008), we think that we can use this conceptual framework in order to study the elaboration of the Walloon adaptation plan. Indeed, this policy instrument raises several challenges related to the integration process of climate change adaptation, i.e. integration of adaptation in the different sectoral policies, between all policy levels and by all concerned stakeholders.

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