

## The challenge of framing adaptation policies: influence of policy design on implementation success<sup>1</sup>

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**2<sup>nd</sup> DRAFT VERSION: PLEASE DO NOT QUOTE WITHOUT AUTHORS' CONSENT!**

### Abstract:

The implementation of adaptation policies suffers from several barriers and limits. If adaptation is now well set on the political agenda of most developed countries only a few examples of concrete policy realisations were found by recent comparative assessments. This paper investigates how the design of adaptation policies and particularly the framing of goals, on one hand, and the construction of burden-sharing agreements, on the other, might influence the success of implementation. The study is based on the methodology of comparative case study and analyse pairs of implementation processes in India and Switzerland. Main findings of this research are that policy objectives which are targeting specifically climate change impacts turned out to be less feasible than policies aiming at reducing drivers of vulnerability in both Indian and Swiss context. Reasons for this are that stakeholders did not perceive climate impacts as a urgent and salient issue. Furthermore, designing adaptation policies implies trade-offs that were not well managed when climate impacts were prioritised over drivers of vulnerability. Besides, in the case of the Swiss national adaptation strategy, the attempt to attribute adaptation costs to CO<sub>2</sub> emitters caused important political opposition in the parliament which led to implementation delay. Therefore, we argue that although designing adaptation policies that focus on future climate risks and whose burden are placed on GHG emitters is desirable from the the perspective of sustainable resources management and distributive justice, their implementation seem hardly feasible at the present time.

**Keywords:** climate change, barriers to adaptation, political sciences, policy design, implementation, feasibility

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<sup>1</sup> This research was realised with the support of the Swiss National Science Foundation (SNF) and the Swiss Agency for Development and Cooperation (SDC)

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## 1. Introduction

The need to develop specific policies to adapt to the multiple risks of climate change has been emphasised since the beginning of the international negotiations to the UNFCCC in the early 1990's. However the policy diffusion of adaptation and more precisely the implementation of these policies in member states seem to suffer from several barriers and limits (Adger et al. 2007). Two striking features have been underlined by recent studies comparing adaptation policies in OCDE or European Countries and in developing countries (see: European Environmental Agency 2009; Gagnon-Lebrun and Agrawala 2006; Keskitalo 2010; Massey and Bergsma 2008; Massey 2009; McGray et al. 2007; Swart et al. 2009). First, while adaptation has appeared on the political agenda of many countries, legislative changes as well as concrete implementation of measures have rarely occurred. Adaptation policies have often been limited to enunciation of general objectives, formulation of guidelines and funding of climate impacts research programs. In some cases, public administrations and governments have initiated legislative reforms (Delta act in the Netherlands) or even created new administrative entities in order to deal with climate change adaptation (UKCIP network in England). However, the production of concrete policy outputs has barely followed. Second, in the cases where decisional processes have resulted in the concrete implementation of outputs and measures, their added value has appeared somewhat deceiving in comparison to business as usual policies led in the several domains concerned with climate change adaptation. Consequently adaptation policies often appear to be little more than "empty shells". It can be argued that current policymaking is facing an *implementation deficit* (see: Bardach et al. 1977; Hill and Hupe 2009; Pressman and Wildavsky 1984; Sabatier 1986), which is characterised by the fact that the more or less binding obligations on adaptation created by international institutions, namely the UNFCCC (article 4e and 4f) or the European commission (2009; 2007) have been problematically and only partially translated into concrete implementation acts by state and sub-state actors.

The reasons underlying the implementation deficit of adaptation policies are incompletely addressed by the scientific literature. In fact, up to the publication of the fourth report of the IPCC in 2007, the capacity of states to develop adaptation strategies has been essentially described using the concept of *adaptive capacity*, that is "the whole of capabilities, resources and institutions of a country or region to implement effective adaptation measures" (IPCC 2007). Hence adaptive capacity has been essentially measured using indicators such as per capita GDP or literacy rates, that are criterion which are strongly related to the level of economic development (Smit et al. 2001). It has been suggested that industrialised countries which have a relatively high adaptive capacity would respond almost naturally to climate change. As a result, adaptation was viewed above all as a challenge facing developing countries (Gagnon-Lebrun and Agrawala 2006; Wolf 2011). This hypothesis of a causal link between the existence of capacities and the implementation of adaptation measures was powerfully dismissed by O'Brien et al., (2004b) who demonstrated, in the case of Norway, that strong adaptive capacity would scarcely be sufficient to guarantee that concrete policy action be taken in highly vulnerable areas.

More recently, a large number of studies have examined the various obstacles that may stand in the way of adaptive capacity. Notably, the last IPCC report has identified several barriers to adaptation process (see: Adger et al. 2007): uncertainty of available scientific knowledge which could be significant enough to cause embarrassment to decision-makers (Dessai and van de Sluijs 2007; Schneider and Lane 2006); fragility of ecosystems which renders dull certain forms of policy intervention (Hulme 2005), cost-benefit ratio of adaptation measures which is not always favourable to public action (ECA 2009); the lack of economic resources (Global Environmental Facility (GEF) 2010); and, finally, weakness of state institutions that are unable to design and implement adaptation policy (Yohe et al. 2006).

Although the concept of barriers to adaptation did improve our understanding of what might hinder efficient implementation, it is surprising to note the extent to which knowledge, theories and conceptual frameworks from the sociology, political or administrative sciences have not been considered by research up to date (Biesbroek et al. 2009; Dovers and Hezri 2010). Although resource availability and capacities do have an influence on the likeliness of efficient implementation, the integration of adaptation into the conduct of public policy is necessarily a

social process, whose success also depends on political variables that the literature on climate change is only starting to study (see: Adger et al. 2009; Dupuis and Knoepfel 2011; Dupuis 2011; Moser and Ekstrom 2010; Wolf 2011).

We argue that *policy design* theories are highly relevant for explaining some of the reasons underlying implementation deficit of adaptation processes. Within the political sciences, form and content of a policy is one of the primordial independent variables for explaining implementation success (see: Goggin 1986; Ingram et al. 2007; Matland 1995; Schneider and Ingram 1993; Schneider 2006). Every policy is based on assumptions on the changes and goals that are socially desirable, and by which means they can or should be reached. Independently or in conjunction with other variables, such as the role of actors and the characteristics of institutions, the coherence of the inherent social theory that is embedded in a policy is likely to influence the success of its implementation (Knoepfel et al. 2011).

Specialised literature on adaptation suggests that two specific aspects of policy design might trigger barriers to implementation. First, Adger and al. (2009: p341-342) pointed out that different policy goals might be assigned to adaptation processes according to prevalent social values. This choice between several policy objectives is, hence, likely to be related to trade-offs and limits. Second, the attribution of burden and benefits of adaptation processes is also one of the most disputed aspects of adaptation policy design (Adger et al. 2006). The question of who should benefit of adaptation is thus very likely to influence the social acceptance of any policy proposal.

In this article, we propose to explore empirically to what extent the framing of policy goals and the construction of target and beneficiary groups might hinder successful implementation of adaptation and why. We propose a theoretical framework that conceptualises these relations and we apply it to four case studies of adaptation policy processes in India and Switzerland. Based on this analysis, we identify limits and trade-offs that are related to the choice of particular policy objectives and designs. We believe our results constitute a call for changes in both UNFCCC rules on adaptation finance and in the way policymaker frame adaptation policies at the national level.

## **2. Methods**

We have relied on comparative case study analysis. We have selected our cases according to the dependent variable. The logic was to find similar cases of adaptation policy process with variable success of implementation. Two policies were identified in India, in which goal framing differs, along with implementation success. A process-tracing analysis was carried in order to identify to which extent initial goal framing influenced the result of the implementation process.

This comparative design allows us to compare pair of cases that are situated in the same context. If direct cross-context comparison is of course problematic, the testing of relational patterns identified in one context in the other is possible. Since, Indian context and Swiss context are extremely different, the validation of a causal pattern identified in one context in the other allows to a certain extent for generalisation. We also think that this comparison between these two different contexts is also relevant for the studies of barriers to adaptation since implementation processes are generally more advanced in developing and emerging countries than in industrialised countries (Gagnon-Lebrun and Agrawala 2006).

For each set of cases, context is briefly described and then policy designs and implementation success are compared. Data have been collected through policy documents furnished by implementing agencies as primary data for the analysis of policy design, while assessment of implementation relies both on policy documents and on more than 20 semi-structured interviews which were led in situ with project stakeholders

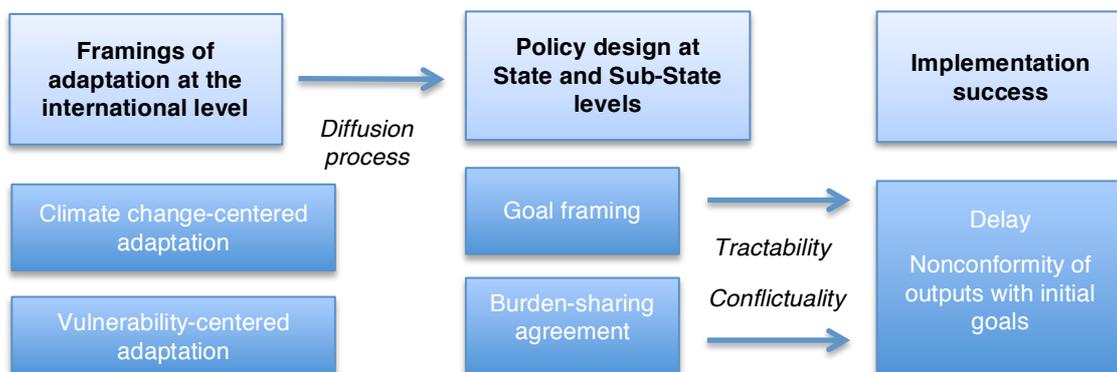
Figure 2: Comparative research design

Implementation Success	High	<p><b>WOTR Climate Change Adaptation Program</b></p> <p><i>Variables of analysis: Policy design</i>  <b>Goal framing:</b> Vulnerability centred  <b>Causal model:</b> Distributive, dependent model  <b>Intervention model:</b> Natural resources management, hortatory and education tools</p> <p><i>Control variables</i>  <b>Location:</b> Maharashtra  <b>Level:</b> Regional  <b>Domain:</b> Rural development  <b>Time period:</b> 2009-2013  <b>Climate risks:</b> Change in rainfall patterns, drought  <b>Beneficiaries:</b> Poor communities with low adaptive capacity</p>	<p><b>Alpes Vaudoises 2020</b></p> <p><i>Variables of analysis: Policy design</i>  <b>Goal framing:</b> Vulnerability centred  <b>Causal model:</b> Distributive, dependent model  <b>Intervention model:</b> Economic steering, corporate governance reforms, artificial snow-making, skia area extension</p> <p><i>Control variables</i>  <b>Location:</b> Vaud  <b>Level:</b> Regional  <b>Domain:</b> Rural development  <b>Time period:</b> 2003-201?  <b>Climate risks:</b> Snowline elevation  <b>Beneficiaries:</b> Exposed and sensible economic-sector with limited adaptive capacities</p>
	Low	<p><b>Vulnerability &amp; Assessment program</b></p> <p><i>Variables of analysis: Policy design</i>  <b>Goal framing:</b> Climate centred  <b>Causal model:</b> Distributive, dependent model  <b>Intervention model:</b> Natural resources management, hortatory and education tools</p> <p><i>Control variables</i>  <b>Location:</b> Rajasthan  <b>Level:</b> Regional  <b>Domain:</b> Rural development  <b>Time period:</b> 2005-2009  <b>Climate risks:</b> Change in rainfall patterns, drought  <b>Beneficiaries:</b> Poor communities with low adaptive capacity</p>	<p><b>Swiss National Adaptation Strategy</b></p> <p><i>Variables of analysis: Policy design</i>  <b>Goal framing:</b> Climate centred  <b>Causal model:</b> Redistributive, polluters-pay principle  <b>Intervention model:</b> Not defined yet</p> <p><i>Control variables</i>  <b>Location:</b> Multiple including Vaud  <b>Level:</b> National  <b>Domain:</b> multiple including rural development  <b>Time period:</b> 2008-201?  <b>Climate risks:</b> Multiple including snowline elevation  <b>Beneficiaries:</b> Not defined yet</p>
		India	Switzerland
		Context	

### 3. Theory

Figure 1 resumes the relations that we postulate between our dependent variable, success of the implementation, and our independent variables.

Figure 1: Analytical model



#### 3.1 Framings of adaptation at the international level

We argue that the formulation of adaptation policies at State and Sub-State level is essentially can be understand as a diffusion process of UNFCCC and IPCC directives and insights on adaptation in nation members' policy framework.

Yet, it is widely acknowledged that since the 90's, several competitive conceptions of adaptation have coexisted in international institutions (see: Brooks 2003; Eakin et al. 2009; Füssel 2007a; O'Brien et al. 2004a; O'Brien et al. 2007; Smit et al. 2000). Defining to what one should adapt, literally the goal of the adaptation process, was even a source of disagreement among scholars (Füssel 2007b). Using the four assessment reports of the IPCC and the initial text of the UNFCCC, we have analysed whether definitions of the problem that is underlying the need for adaptation and the goals related to this process varied across institutions and time (Table 1).

**Table 1: Framings of adaptation at the international level**

Source	Problem	Goals	Climate change centrisism
First Assessment Report of the IPCC (Pentland, Theys, & Abrol, 1990, p. 166) Article 4, UNFCCC, 1992	Climate change which is a phenomenon caused by human activities represents an important future threat that is additional to the risks related to climate natural variability	Adapt to the additional and specific effects and risks of anthropogenic climate change	
Second assessment report of the IPCC (Trenberth, Houghton, & Filho, 1995, p. 56) Third assessment report of the IPCC (IPCC, 2001, p. 984)	Climate variability, which is basically a deviation from climate norm, is problematic for the present and the future independently of its causes.	Adapt to the present and future variability of the climate	
Fourth assessment report of the IPCC (Adger & al, 2007)	Vulnerability to climate change is a symptom of a more general vulnerability to external stress caused by a range of contextual factors	Reduce the diverse drivers of present vulnerability	

We have identified three framings of adaptation at the international level. At the time of the first assessment report, both the UNFCCC and the IPCC embraced a vision of adaptation that insisted particularly on the future impacts of anthropogenic climate change which were described as being additional to natural climate variability. Climate change was thus understood as a new phenomenon, which represented an unprecedented threat for societies and ecosystems because of its speed and potential intensity and magnitude. Accordingly, climate change was seen as a new challenge that necessitated the deployment of new and additional policy responses which would be based on climate modelling and scenarios.

Starting from its second assessment report, the IPCC has officially diverged from this view. Climate variability (which is basically a deviation from climate norm) was identified as the main stress against which human societies should better adapt. The novelty and the unprecedented characteristics of the current climate change were somewhat downplayed in the sense that it was simply seen as a case of long term and persistent variation (more than decades) towards climate norm. Since many societies did not adequately deal with present variability and because incertitude characterised future climate predictions, it was suggested that adaptation policies should aim in priority at reducing present sensitivity and exposure to climate variability.

The fourth assessment report constituted a turning point in the discourse on adaptation since it defined the collective problem as not being caused solely by climate variability or change but by a range of social, environmental and economical factors that are limiting the present capacity to adapt to external stressors and which create a situation of vulnerability. Hence, the aim of adaptation was not to be limited to the mitigation of present and future climate

stimuli but should embrace a more holistic approach that would encompass the diverse environmental, economical or social stresses which contribute to vulnerability. If to some extent the two other framings of adaptation can still be found in the fourth assessment report, the idea that social vulnerability determines exposure and sensibility to climate factors has become dominant and constitutes a criticism of the climate-centrism of the previous approaches on adaptation.

Our analysis thus confirms to a large extent the idea of O'Brien & al. that approaches of adaptation evolved from an *endpoint* conception in which vulnerability results from climate change stimuli to a *starting point* view in which vulnerability is an inherent features of social groups that is aggravated by climate change (O'Brien et al. 2004a; O'Brien et al. 2007) Yet, while we do not deal explicitly with how, where and when these framings of adaptation were diffused<sup>2</sup>, we assume that they are largely influencing goal-setting processes in national and sub-national adaptation policies which in turn do impact the implementation success.

### 3.2 Independent variables: feasibility of policy design

Accordingly to the stage model of policymaking, policies are framed and formulated in the programming phase prior to implementation (see: Knoepfel et al. 2011; Parsons 1995). Policy design implies necessarily the definition of more or less explicit:

- Goals that proceed from the framing of a collective problem, namely real social conditions that are considered problematic, and whose resolution requires public intervention;
- Causal model that designates which actors are able to contribute to resolving the collective problem (target groups) and in the benefit of whom (beneficiaries) and through which burden-sharing agreement.
- Intervention model which is the set of instruments that have to be deployed to force, persuade, or incite target groups to act or to modify their behaviour in order to attain policy goals

Therefore, policy design always assumes a theory on the functioning of social reality which can be resumed under the following formula:

In order to solve  $P$  (collective problem) according to  $G$  (goals),  $T$  (target behaviour) must be changed through  $I$  (intervention model) in the benefit of  $B$  (beneficiaries)

However, not all policy designs are *feasible* to the same extent. Feasibility of a policy design, namely its capacity to produce outputs that will perform the given objectives largely depends on the coherence and the adequacy of the policy assumptions with the social, cultural and political context in which it will be implemented (See: Galston 2006; Webber 1986). In the context of adaptation policymaking, we argue that characteristics of goal framing and causal model c are both of particular relevance to shed light on barriers which could contribute to unsuccessful implementation.

#### 3.2.1 Tractability of goal framing

Every goals and related collective problem definition are not *tractable* to the same extent (see: Hall 2011; Hoppe et al. 1987). Tractability concerns the possibility to manage and tame a collective problem through means at disposal. Some problems might be so wicked or so wickedly defined that they will only result in ambiguous and incoherent goals and means. As Matland (1995) has argued ambiguity and incoherencies between problem, goals and means will in turn lead to confusion, dysfunction and uncertainty in the implementation phase, this being what we could call a “programmed implementation shortfall”. Under theses conditions, actors of implementation process will have to reformulate or reinterpret objectives and means in order to bring some coherence to their action and to overcome this situation. Outcomes

<sup>2</sup> This is however a important research direction

resulting from the implementation of policy which is constructed from a lowly tractable problem can still be extremely positive because of the room to manoeuvre offered to implementing actors. However, it is very likely that in such situation, policy outputs might be delayed or non-conforming to initial objectives.

To some extent, ambiguity or incoherencies between problem, goals and means are likely to be frequent features of adaptation policymaking. Indeed, adaptation is not being developed in an institutional void. Objectives regarding adaptation generally have to be cordoned with the pre-existing policy framework in which it is being integrated. Therefore, adaptation policies are often assigned several societal, environmental or economical goals at the same time. The reaching of simultaneous objectives is however unlikely to occur without certain trade-offs. We argue that ambiguity and incoherence in the way a policy is proposing to manage those trade-offs can lead to intractability.

Furthermore, according to the social context, policy objectives might not be considered as solving a salient issue by implementing actors, beneficiaries or target, what can lead to obstacles in implementation (see: Rochefort and Cobb 1994). Indeed, political definition of social problems can be quite divorced from people's preoccupation (Dery 2000). Hence, it is likely that policy problem which is not perceived as a salient issue by implementing actors or target and beneficiary groups will be more hardly tractable as well. The question whether adaptation policies respond to a salient issue is particularly relevant since climate change impacts were first framed as policy problem in international institutions. Adaptation is hence often brought into national and sub-national decisional processes through top-down processes. As such, climate change impacts might be relatively disconnected from what local stakeholders perceives as urgent and severe collective problems which should be resolved in priority by public action.

### 3.2.2 Conflictuality of causal model

Causal models are theoretical constructs by which policymakers designate who should be targeted, in benefit of whom and through which burden-sharing agreement. Certain causal models are more likely to generate resistance from civil society than others. Ripley and Franklyn (1982) have notably argued that redistributive policies which implied a resource transfer from target groups to beneficiaries will be more difficult to implement than distributive policies which consist of a direct transfer of good and services from state to beneficiaries<sup>3</sup>.

Not only the distributive or redistributive nature of policy, but also the characteristics of social groups taken as targets, matters for the success of implementation. As Ingram & Schneider (1990, 1993) have argued, power and reputation of social groups determine to a large extent the type of policies by which they will be targeted. According to social group characteristics, policy generally follows certain patterns which are institutionalised and embedded in the culture of policymaking and therefore difficult to change (see Table 2). For example, problems affecting advantaged groups, which are both powerful and well reputed, are generally treated in priority, through flexible instruments which allow oversubscribing of benefits. On the contrary, problems affecting dependents group (weak and positively reputed) tend to be ignored by the State, and the allocation of benefits is generally undersubscribed and conditioned to certain conditions.

Policies that are designed in line with these patterns will fit existing political culture and are thus, according to the phenomenon of path dependency, likely to generate increasing returns. Consequently, it is likely that the implementation of such policies will produce less conflictuality (Schneider, 2006; Ingram, et al., 2007). Nevertheless, policy designs that break with traditional patterns of policymaking constitutes a notable change that can only happen under particular conditions (see: True et al. 2007). Hence it is likely that their implementation will encounter more resistance.

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<sup>3</sup> However, it is to underline that every policy is to a certain extent redistributive, since supplementary resource allocation from state budget to specific actors generally reduces the amount of resources available for other activities

**Table 2: patterns of policy actions in function of target population**

Type of target population <sup>4</sup>	Problem framing	Logic of intervention	Burden sharing	Policy instruments
Advantaged (strong & positively reputed)	Important public problem	Agency outreach	Benefits oversubscribed /Burdens undersubscribed	Capacity building, self-regulation, voluntary actions  Unconditional subsidies
Dependents (weak & positively reputed)	Problem is to be solved mainly by the private sector	Client-initiated contacts	Benefits undersubscribed /Burdens oversubscribed	Conditional aid  Subsidies vs. eligibility requirement  Symbolic and hortatory instruments
Contenders (strong & negatively reputed)	Problem is conflicting with others interests	Targets subvert implementation	Benefits are sub-rosa /Burdens are symbolic and overt	Regulatory instruments
Deviants (weak & negatively reputed)	Personal problem	Avoidance	Benefits very undersubscribed /Burdens very over subscribed	Authoritarian and coercive instruments  Sanctions

Adapted from Ingram & Schneider, 1990, 1993

We argue that the way policy designates targets and beneficiaries and allocate benefits and burdens are central to the discussion of adaptation policies deficit. From a normative point of view, it would be desirable for adaptation policy to conform to the principles of distributive justice. In fact, the application of climate justice principles would imply that adaptation policies have to be financed by GHG emitters to the benefits of climate vulnerable social groups (see: Adger et al. 2006). The need to relate cost of adaptation policies to emission of GHGs and to apply the “polluter must pay” principle also emanate from findings of environmental policy literature, which demonstrate that liability for environmental damage is amongst the most efficient means to ensure compliance of polluters (Faure 2012; Schwarze and Hoffmeister 2010). However, if adaptation policies that produce redistributive effects between GHGs emitters and vulnerable groups are desirable from the point of view of equity and environmental performance, it is precisely this sort of policy design which would, according to target construction theories, trigger barriers to implementation.

### *3.3 Dependant variable: Implementation success of climate change adaptation policy*

Because adaptation policies are still young, it is still too early to assess their final outcomes. However, in the current context of policymaking, which is characterised by a gap between policy intentions and concrete realisation, we argue that success of implementation can be adequately captured by the presence of barriers towards the production of policy outputs. Therefore, two indicators can be used to measure implementation success. First, *delay*, which can occur, on the one hand, as a result of parliamentary opposition to policy proposal and which indicate a lack of political support (Mazmanian and Sabatier 1983) or, on the other hand, because of active or passive resistance by implementing actors (Lipsky 2010; Pressman and Wildavsky 1984). Second, *conformity* is a measure of the congruence of policy outputs with initial goals. Conformity allows the analyst to evaluate the performance of the

<sup>4</sup> The social construction of target population is of course dependant of the social context in which it is produced. Identity of the deviants might be different in a western country than in North Africa for example.

implementation process accordingly to ambitions and expectations expressed in the initial design of the policy. Conformity indicates that the policy process did not result in a “paper implementation” (Goggin 1986; Marsh and McConnell 2010), namely that outputs produced effectively contribute to reach policy objectives. Unconformity of outputs shows that the initial goals of the policy could not be translated in coherent acts.

#### **4. Results**

##### *4.1 India: Comparison of the Vulnerability & Adaptation (V&A) program & the Climate change adaptation program (CCA)*

According to the comparative assessment of Brenkert & Malone (2005) India scores among the most vulnerable countries in the world. The *global Adaptation Index* (<http://index.gain.org/ranking/vulnerability>) ranked India 129 on 187 countries right after the small islands of Dominica and Vanuatu which are directly threatened by sea level rise.

India has formulated its national policy on adaptation in 2008. However as the Ministry of environment stated it:

*“India has yet to draw up programs aimed exclusively at addressing critical vulnerabilities to climate change. In other words, India does not implement any adaptation schemes, per se, but has made substantial efforts to integrate adaptation into development schemes”* (Rajasree 2008)

Most of the policy actions that tackled explicitly adaptation were designed and implemented by civil society organisations with more or less involvement and support from national or Indian states level authorities. Among these the V&A program, which started as early as 2005, and to a lesser extent WOTR adaptation project of 2009 can be considered as pioneer interventions.

Both of these adaptation programs resemble traditional rural development programs. They target communities of semi-arid areas of India in which agriculture is the main economical activity. Agriculture in those regions is quite sensible and exposed to climate change since it is mainly rain fed and dependent on monsoon rain. Both policies are similar with regard to many aspects of their design, but differ in goals definition.

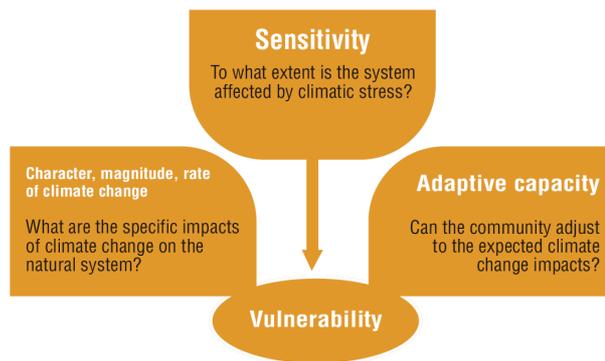
##### 4.1.1 Goal framing

The two programs depict the current situation in the same way. Climate conditions are characterised by low annual rainfall (between 400-800mm) and high interannual variability of monsoon intensity and time (Bruderle and Schwank 2009). Thus soil erosion and water scarcity is threatening agriculture and farmer’s livelihood, because of potential reduction of crop productivity and livestock farming possibilities and even crop failures. Climate change is expected to further aggravate water scarcity and soil erosion because precipitation is projected to become more erratic with heavier extreme rainfall events and longer intermittent dry and warm gaps.

However, the two programs differ in the weight accorded to climate factors in the collective problem and in its resolution. The V&A describes climate variability and future climate change impacts as the root of a problem which needs to be resolved. The main objective of the policy is thus defined as: “ to secure the livelihoods of rural poor and vulnerable communities by promoting adaptation measures that build and enhance their capacity to better cope with adverse impacts of climate change and by improving their disaster preparedness” (SDC V&A Programme 2005).

Goal formulation suggests that adaptation is about enhancing the capacity of target groups to deal with climate impacts, what would in turn improve their livelihood. Vulnerability of target groups is thus understood as the result from climate variability and future changes impacts (see figure 3). Hence, the policy would logically have to mitigate those impacts or to raise the adaptive capacity of target groups toward them.

figure 3: Conceptual model of the Vulnerability & Assessment programme



(Bruderle and Schwank 2009)

The CCA shows a quite different understanding of the problem. It stated the necessity to empower rural communities in order to make them capable of adapting to external stressors: “the general objective of the program is to “have capacitated and empowered rural communities adapted to climate change risk” (SDC 2009).

The CCA explicitly refers to the model of social vulnerability (O'Brien et al. 2004a; O'Brien et al. 2007), and considers climate stimuli only as one factor among others which can bear on the livelihood of social groups. Thus, vulnerability is considered as an inherent attribute of target groups which is due to contextual conditions that are to be improved by the policy in order to raise adaptive capacity.

#### 4.1.2 Causal model:

Both policies are suggesting that target groups, namely poor farmers of rural communities who bear or will bear the adverse effects of climate stimuli, should change their own behaviour in order to attain policy goals. Construction of targets and beneficiaries largely corresponds in the two cases to treatment reserved to “dependent groups” as depicted by Ingram & Schneider (1993). Both policies are distributive, but the provision of goods and services by implementing agencies are conditioned to an intense participation in the work needed by the intervention. The policy is financed through public funds, what allows to avoid designating any particular responsible for the policy problem which does clearly minimise the risk of conflicts arising from the implementation of the program.

#### 4.1.3 Success of implementation

Whereas both policies are to a large extent similar, the outputs of the V&A have appeared disappointing to the implementing agencies. The V&A did come out with a quite extensive list of concrete actions which concerned mainly natural resources management and watershed treatments (see: Bruderle 2009; Bruderle and Chakravarti 2009; Bruderle et al. 2009a; Bruderle et al. 2009b; Nambi and Balasubramanian 2009). However, the relation and coherence of these policy outputs to the initial goals and ambitions of the policy were rather low. We argued that this is because goal framing of the policy turned out to be hardly tractable.

Indeed, the instruments which were implemented aimed to increase water availability and to reduce soil erosion notably through hillside treatments, renovation and construction of water harvesting and stocking structures and reinforcement of local institutions. These measures had the potential to largely benefit farmers, because enhancement of water availability and soil productivity means increasing agriculture productivity and decreasing crop failures rate, what would secure to some extent incomes and thus improve livelihood. However, the mechanisms through which benefits brought by natural resources management would contribute to increased adaptive capacity of target groups to climate change and variability were not conceptualised, nor was there any instrument implemented to ensure that relationship. Yet, temporary increase of water availability will only turn to be beneficial in terms of adaptive capacity to climate effects if water demands and land uses do not compensate the gains produced by policy measures. Studies conducted in villages where

watershed treatments were previously carried out showed that in some cases, farmers used water benefits to run supplementary cash crops and started to use seeds that were more input (water and fertilisers) demanding and less resistant to heat (Rao 2010; WOTR 2011). While, incomes and livelihood of farmers rose, new agricultural practices compensated ecosystem benefits of the intervention, an outcome that can hardly be described as a success in terms of reducing vulnerability to climate stimuli.

To be coherent with initial goals and ambitions, policy actions would have had to mitigate climate effects on target groups or to raise their capacity to adapt to those stressors. Attempts to identify policy instruments which could have reached this goal appeared daunting, time and resource consuming, as well as a source of disagreements among implementing actors who had to rethink several times the implementation scheme. Reasons for this are, on the one hand, that the implementation of instruments which would have tackled solely and specifically climate risks would have been of little pertinence in a context where salient issues, such as absolute poverty or food shortage, were still not resolved. On the other hand, because basic infrastructures for water harvesting and distribution were lacking or deficient, important gain in agriculture productivity could be obtained by very simple interventions on resource management, taken independently of any predictions of future climate change impacts. Measures conform to initial goals and dedicated to the mitigation of climate change effects should have been based on climate scenarios and confronted with the difficulty of predicting the scope and direction of climate stimuli at the regional level. Yet, the V&A, which addressed principally risks related to drought and water scarcity, was confronted with the worst flood situation since the last 300 years<sup>5</sup> in the second year of its implementation phase. In this context, it is of course very comprehensible that the policy turned to an intervention model based on resource management practices, which do not need to rely on climate scenarios and exert positive outcomes independently from climate effects.

We argue that the climate-centrism of the goal framing clearly weighted negatively on the implementation. Ambiguity in the treatments of trade-offs between the goals of improving livelihood and enhancing adaptive capacity as well as low salience of the policy problem contributed to the fact that outputs produced could only be weakly related to initial goals. Ultimately, although the V&A propose to tackle climate change impacts, it represented little added value in comparison to any business as usual rural development policy which would probably have produced policy outputs of the same quality with more efficiency.

While it is not possible to assess final outcomes of the CCA since the program is still running, it performed better with regard to the criteria of outputs conformity with initial goals. The policy problem definition of the CCA, which focused on the reduction of the drivers of social vulnerability turned out to be more tractable in the context of rural India.

Implementation of the CCA relied largely on the same instruments as previous rural developments projects in the area and consisted principally of watershed-based interventions. The added value of the program lied principally where the V&A stopped, namely in the identification of development patterns which could contribute to decreasing both poverty and climate vulnerability. If relating conceptually rural development to mitigation of climate effect turned out to be intensively time and resource consuming for implementing actors, this process succeeded in identifying two important trade-offs. First, gain in water availability brought by watershed development will only improve adaptive capacity to the same extent as livelihood if consequent agriculture development does not accentuate immoderately human pressures on local ecosystems, and if reforms of agricultural system do not lead to less resilient cultivation practices. Hence, the CCA tried to ensure that benefits brought by natural resource management would be used in a way that minimise those trade-offs through training and education measures. Farmers were prompted to use water benefits to increase their production and incomes in a climate-friendly way. Exploitation of supplementary crops would have to be based preferentially on the use of local seeds which are well adapted to local

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<sup>5</sup> <http://infochangeindia.org/disasters/news-scan/130-dead-in-desert-floods-rajasthan-s-worst-in-300-yrs.html>

conditions and heat resistant while the cultivation of new crops that required large amounts of water and fertilisers should be minimised. This pattern of development that the policy tried to trigger was not only more climate resilient but would also diminish economic vulnerability towards market price fluctuation by minimising the spending for exogenous seeds and fertilisers.

We argue consequently that the design of CCA which framed the policy problem as resulting from several drivers of social vulnerability instead of being caused by climate stimuli turned out to be more feasible in the context of rural India. We turn now to the case of an industrialised country to test if this pattern holds in another context.

#### *4.2 Switzerland: Lessons from the Swiss national adaptation strategy (SNAS) & Vision Alpes vaudoises 2020 (VAP2020) programs*

Switzerland is, according to the *global adaptation index*, one of the least vulnerable countries to climate change (ranked 4<sup>th</sup> on the vulnerability scale (<http://index.gain.org/ranking/vulnerability>)). However, if from a general perspective Switzerland can be considered as very resilient to climate effects, area like the Alps as well as certain economic activities like winter tourism are extremely sensible and exposed to climate impacts (Müller 2011; OcCC 2007, 2008). If the threats that represent climate change for Switzerland cannot be judged on the same scale as in the Indian context, there are evidences than even in areas where a potential vulnerability to climate change is acknowledged, political factors are delaying and preventing successful implementation (see: Dupuis and Knoepfel 2011; Dupuis 2011).

In this context, we compare, on the one hand, the national adaptation strategy of Switzerland, which is being elaborated since 2008 but has not yet been implemented due notably to political resistance and, on the other hand, the VAP2020 which is probably, at the cantonal level, the most advanced policy initiative on adaptation in winter tourism. VAP2020 is an economic development program targeting the tourism sector in a rural area, while tourism in rural areas is also one of the prioritized domains of intervention by the SNAS.

##### 4.2.1 Goal framing

Several studies underlined the fact that temperature rise and concomitant snowline elevation will threaten a substantial proportion of ski resorts in low-lying areas (under 1500m). For the canton of Vaud, 8 of the 17 resorts of the region would be considered as snow unsecured for a 2° rise in temperature. For a 4° rise (which is likely to occur in the Alpine region towards the end of the century), only 1 resort would stay snow-secured (Müller 2011; OCDE 2007). While, both policies acknowledged the fact that climate change represents a menace for low-lying ski resorts, they differ in the role and extent given to climate effects in goal framing.

The SNAS aim to: “limit risks and seize benefits of climate change and to increase adaptive capacity of society, economy and environment” (OFEV 2011). Climate stimuli are treated as future risks that are additional to present stress drivers on human and ecological system. Therefore, tourism in rural area is identified as one of the priority domains in which additional policy action is needed to address climate impacts. Consequently, the national strategy framed adaptation as a process, which should aim to tackle directly the problem of future climate effects.

In comparison, VAP2020 is a rural development policy targeting winter tourism in the Alps and which was initiated as soon as 2003 by the Canton of Vaud. The policy explicitly mentions climate risks bearing on the future of winter resorts in its problem definition. However, largely more emphasise is put on the structural and economical weaknesses of winter tourism and its decreasing competitiveness in comparison to national and international concurrence (Furger 2003; SELT 2006). The fragmentation of the tourism sector between too small and competing companies that are lacking the resources to undertake the necessary steps to adapt to changing climate and economic conditions is depicted as the roots of the problem. Thus, VAP2020 framed climate change as a driver of a more general vulnerability situation rather than as the main problem to be tackled. Hence, the goal of the policy was to create the social and economic conditions that would render the winter tourism of the region attractive and competitive on the mid-term. In 2008, after that concerns about viability of the

regional resorts in the context of climate change were expressed in the parliament (Conseil d'Etat du Canton de Vaud 2008), the policy was revised. Although problem and goal framing remained the same, the implementation of policy instruments which would tackle more directly climate impacts were worked on.

#### 4.2.2 Causal model

The SNAS explicitly adopted the “polluter must pay principle” and stated that those who contribute to anthropogenic climate change (namely the GHG emitters) should bear the cost of adaptation. The intention of the administration that drafted the strategy was to design a redistributive scheme which would be complementary to mitigation policies. This seemed a quite logical proposition since, in environmental policies, liability normally affects positively the behaviour of polluters and tend to reduce externalities (Faure 2012; Schwarze and Hoffmeister 2010). Furthermore, the financing of adaptation measures through the redistribution of resources gathered through mitigation policies, notably tax on CO<sub>2</sub>, or allowances market is a way of ensuring a certain form of climate justice (see: Adger et al. 2006). However, while this causal model implied resource transfer from GHG emitters to climate vulnerable groups, the strategy didn't precise by which modality and according to which principles burdens should be borne and attributed, nor did it designate nominally beneficiaries and target groups. This was notably because such decisions lied beyond the attribution of the federal administration and would have to been taken by electoral representatives through the parliamentary process.

In comparison, VAP2020 causal model corresponds to the dependent model of target group construction. Winter tourism is well reputed in society because of the cultural prominence of skiing in Switzerland, while at the same time the sector suffer from economic weakness and is dependent of state aid in many regions. The policy is distributive and important amount of goods and services will be allowed by the canton to the beneficiaries under the condition that they operate structural modifications which would lessen their vulnerability to economic competition as well as to climate stimuli.

#### 4.2.3 Implementation success

The implementation of the SNAS shows evidence that even in the context of an industrialised country, a climate-centred policy design will likely encounter feasibility problems. Furthermore, it shows that even though designing redistributive policy might be desirable to ensure environmental effectiveness and fair attribution of burdens and benefits, these features might precisely cause important conflictuality and social resistances.

Because of the institutional characteristics of Switzerland, notably federalism and the functioning of its democracy, a law article which would give the federal government competency to take adaptation measures at the national level and to coordinate canton's effort had to be voted by the national parliament, in order to implement the national strategy. Two versions of a law article on adaptation went through the vote of the national council on the 31.05.2010. The first version of the law article was proposed by the government and would have simply attributed the competency to coordinate adaptation measures at the national level. A more ambitious proposition was elaborated by a fraction of the national council which proposed that, in conformity with the causal model of the strategy, adaptation policy had to be financed principally by GHG emitters through the allocation of resources stemming from the appliance of the CO<sub>2</sub> law, namely sanctions against non-compliers and auctioning of CO<sub>2</sub> allowances. Interestingly, the national council rejected both law articles. The idea to relate the cost of adaptation to the act of emitting CO<sub>2</sub> emissions encountered strong resistance of elected representatives and led to the fact that both law propositions were indistinctly refused. Hence the proposition to frame adaptation policy as redistributive policy, which would target GHG emitters to the benefit of vulnerable regions and actors, seems rather unfeasible in the Swiss context.

Furthermore, another reason for the refusal of the law article on adaptation by the national council, which is apparent in the parliamentary debates, arises from the perception of many elected representatives that there would be no added value in investing resources and time to elaborate and implement a national policy tackling specifically climate change impacts at the

national level. Elected representatives formulated the idea that climate risks were not salient and important enough or could not be identified with enough clarity. Furthermore, it was argued that the current policy framework and notably the disaster risk reduction policy was sufficient to deal with future climate impacts and that accordingly, new policy actions were not necessary. Interestingly, the framing of adaptation as a necessary process in order to tackle additional climate risks did not convince decision makers, which believed that the current legislation or policy framework was sufficient to address this matter. Hence, both the redistributive aspects of the policy and its specific focus on climate stress led to resistance in the national council which in turn delayed passing the law article on adaptation<sup>6</sup>.

In the case of the VAP2020, the fact that the collective problem was defined as resulting mainly from structural deficiencies and lack of competitiveness, increased the tractability of goals and contributed to the early start of the policy. Furthermore, the fact that the policy was distributive lessened considerably the conflictuality between target groups which also contributed to the advanced stage in implementation.

The VAP2020, which is still running, led to several interventions that were aimed at increasing the economical viability of winter tourism in the area of implementation. Regional climate studies focused on the future availability of snow in the resorts concerned by the policy were initiated, but most policy actions were taken independently and before the research results. Up to now the policy produced four principal outputs in response to the idea that the tourism sector did not have the capacities to adapt to changing and economic conditions and climate on its own. First, several ski lift companies were merged in order to increase their size and capital; second, a new governance structure was created in order to assure promotion and marketing of winter tourism activities in the region; third, a steering committee gathering main stakeholders, local authorities and implementing agencies was created with the task of conceiving a global strategy which would coordinate the development of all ski lift companies in the region; and four, the development of summer tourism offers was reinforced and financially supported by the implementing agency. All these measures concerned primarily the reduction of structural factors of vulnerability and could have been taken with positive outcomes independently of climate change effects.

The distributive design of the policy also played a positive role in its quick development. In a country with an important liberal tradition, different companies of variable size, and sometimes, divergent economic interests accepted to lose some of their autonomy, to cooperate or in some cases to operate fusion in exchange of a potential future increase of state aid and subsidies. Besides allocation of public resources to private companies of the alpine tourism sector has benefited from public and political support due to the fact that this economic sector is both well reputed and its economic weakness is largely acknowledged. Thus, the distributive design of the policy conforming to the “dependent model” did lessen the conflictuality between actors and favoured implementation.

Interestingly, the measures that the VAP2020 is trying to implement to tackle more directly climate impacts are precisely those which are encountering social resistance and which haven't been implemented until now. Artificial snowmaking and extension of ski area towards higher altitude are the two most direct ways of diminishing the impacts of snowline elevation. However, both measures imply important economic trade-offs. In fact, such interventions are cost, time and energy intensive and environmentally damaging. Small ski lift companies do not have the resources to undertake them on their own. Benefits of such measures will only outweigh the costs depending on how long future climate conditions and notably temperature rise will allow artificial snowmaking and extension towards higher altitude to be profitable and effective against snowline elevation. Thus, such calculation can only be made through precise snow models and climate prediction at the local level that were still not available at the present time. Therefore, investments in climate-centred policy instruments had to be delayed

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<sup>6</sup> The law article on adaptation was reintroduced later under its original formulation (without a mention of redistributive aspects) after a conciliation session between the two national chambers of the parliament on the 13.09.2011

until definitive research results. Even if studies will conclude that artificial snowmaking and ski area extension are viable options on the mid-term, the environmental trade-offs involved and the probable obligation on the long-term to switch definitively to summer tourism for most of these low lying resorts, will make these measures hardly feasible due to political opposition which have been already strongly expressed in the public arena and in the media (Modoux).

## **5. Discussion of the results and conclusions**

Our empirical analysis allows us to formulate two main arguments. First, adaptation policies designed to principally focus on climate effects mitigation tend to be less feasible than policies aimed at reducing drivers of social vulnerability independently of the level of development of the region where the policy is implemented. We argue that the reasons for this are, first:

- The degree of certainty and the precision of regional climate models are often still insufficient to allow for decisions and acts which would target specifically future climate impacts.
- Climate impacts are not perceived as a salient issue in every context. In the case of developing countries, other urging issues such as poverty, hunger or underdevelopment are perceived as more pressing than climate impacts by stakeholders. In the case of winter tourism in Switzerland as well, stakeholders consider that other stressors like short and mid term economic pressures are more urgent than climate stimuli.
- There are obvious trade-offs hindering implementation of measures that aim to mitigate climate stresses. In the Indian context, case studies demonstrate that not every pattern of development is compatible with the objective of enhancing the capacity to adapt to climate change effects. Similarly, in low lying ski resorts of Switzerland, mitigation of snowline elevation is associated with environmental and economical trade-offs and might be only rentable on the short to mid term. Because policies based on the social vulnerability model are more holistic and do not necessarily prioritise climate factors in goal framing, they seem to allow for a better management of trade-offs between mitigation of climate impacts and other socially relevant objectives.

Table 3: results

Context	Adaptation Policy	Problem and goal framing	Causal model	Explanatory mechanisms	Implementation success
India	V&A	Climate-centred	Distributive Dependent model	Low salience of the problematic of climate effects in the context of implementation No management of trade-offs and ambiguities between economic development pathway and climate change adaptation	Lower conformity of outputs with initial goals
India	CCA	Vulnerability-centred	Distributive Dependent model	High salience of the problem definition Low ambiguity. Economic development prioritised. Climate change adaptation integrated through education and sustainable production practices	Higher conformity of outputs with initial goals
Switzerland	Suisse National Adaptation Strategy	Climate-centred	Redistributive Burden on GHG emitters to the benefit of vulnerable areas and actors	Low salience of the problematic of future climate change effects in the context of implementation High conflictuality of the proposition to apply the polluter must pay principle	Low conformity of outputs Delay
Switzerland	Vision Alpes vaudoises 2020	Vulnerability-centred	Distributive Dependent model	High salience of the problem definition Low ambiguity. Economic development prioritised. Climate change adaptation integrated in a second step through artificial snowmaking and ski area extension. Implementation conditioned to environmental impact and climate studies results	High conformity of outputs Delay in the implementation of instruments tackling specifically climate effects.

Second, policy designed as redistributive and placing the burden of adaptation on GHG emitters tend to generate more conflictuality and are thus less feasible. We argue that this is because:

- Uncertainty in the attribution of climate change makes the design of burden sharing agreements, which could be scientifically or ethically justified, difficult.
- Targeting GHG emitters with the introduction of some form of liability for adaptation cost will be particularly difficult, given that some categories of emitters do correspond to “advantaged social groups” (Ingram et al. 2007; Schneider and Ingram 1993) which dispose both of power and good reputation and which are very likely to oppose strongly implementation of redistributive policies as the case of the Swiss national adaptation strategy illustrates it.
- Potential beneficiaries of adaptation policies often contribute to some extent to climate change. This fact does constitute a counter-incidentation for them to claim for

fairness in the attribution of resources required to increase resilience to climate change effects.

Our results draw the rather pessimistic assessment that adaptation policies which tackle directly future climate risks with a fair distribution of burden and benefits are those which are the less likely to be politically feasible. It can be argued that climate-centred adaptation policies with a redistributive design do in fact represent much added value in comparison to current policy practices. They imply that we account for future climate risks in present policymaking, according to prevention principle, and that we attribute the cost of climate change anticipation to the polluters what would constitutes an important incentive to reduce GHG emission. We argue that adaptation policies that focus on climate change effects with a redistributive design constitute a *paradigmatic change* (Hall 1993) in comparison with current policymaking. Indeed, environmental policies in developed countries are generally reactive rather than pro-active and reinforcement of environmental protection often necessitates the occurrence of a catastrophic event (see: Ungar 1992). Furthermore, if disaster risk reduction policies do normally anticipate future risks they place the burden of the policy response on society as whole because of the natural causes of those risks. Because policy changes are generally incremental (True et al. 2007), adaptation policies which would both features anticipation of future changes and cost attribution to GHG emitters are not likely to be feasible without some important deep and larger social evolution.

However, we believe that some of the conceptual clarification and evidences that we brought through this research have positive and practical application as well. First, we argue that policymakers should be aware of the several ways adaptation policies can be designed and the trade-offs that this implies. If climate-centred policy design would be the best option to anticipate adverse climate impacts on natural resources and human activities, those policies have little sense in contexts where current policies and practices do not adequately deal with present stressors on human and natural systems. Climate change certainly represents a real threat to many fragile ecosystems and to certain economic sectors, however this fragility often results from other factors as well which have to adequately weight on the design of policies.

Second, we argue that eligibility rules to the several adaptation funds that are managed by the UNFCC and the GEF are counter-productive to the elaboration of policies that are effective and efficient. Indeed, the Special Climate Change Fund, the Least Developed Country Fund and the Adaptation Fund are all requiring from project holders a problematic distinction between baseline development needs and climate change related risks (UNDP 2010). The necessity of this distinction arises from the spread of the “adaptation to climate change” model in U.N institutions, which as we have argued, see climate change effects as a new and additional phenomenon which is distinct from climate variability or drivers of vulnerability. Adaptation funding institutions are thus exerting a pressure to implement climate-centred policies which are, according to our empirical observations, little feasible and related with inefficiencies for results that are bringing ultimately few added value in comparison with traditional development practices.

Finally, and in this is also valid in the context of industrialised countries, if the precision of regional climate models is still insufficient to design policies that specifically tackle future climate impacts at the local level, they are sufficient to identify economic sectors and ecosystems which are threaten by climate stimuli. Environmental policies which would further lessen human pressures on natural resources will in every instance generate positive outcomes in the context of uncertainty which characterises the changing climate. Therefore we argue that the risks of climate change impacts can be presently addressed with positive outcomes by a reinforcement of environmental and natural resources protection policies.

## Bibliography

Adger, W.N, S. Agrawala, M.M.Q. Mirza, C. Conde, K. O'Brien, J. Pulhin, R. Pulwarty, B. Smit and K. Takahashi. 2007. "Assessment of adaptation practices, options, constraints and capacity." In *Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. B. Metz, O.R. Davidson, P.R. Bosch, R. Dave and L.A. Meyer. Cambridge, United Kingdom and New York: Cambridge University Press.

Adger, W.N, Jouni Paavola and S. Huq. 2006. "Toward Justice in Adaptation to Climate Change." In *Fairness in Adaptation to Climate Change*, eds. W.N Adger, Paavola. Jouni, S. Huq and M.J. Mace. Cambridge: Massachusetts Institute of Technology Press.

Adger, W.N., S. Dessai, M. Goulden, M. Hulme, I. Lorenzoni, D.R. Nelson, L.O. Naess, J. Wolf and A. Wreford. 2009. "Are there social limits to adaptation to climate change?" *Climatic Change* 93(3):335-354.

Bardach, E, M Weinberg, J Pressman and Massachusetts Institute of Techn. 1977. *The implementation game: What happens after a bill becomes a law*: MIT press Cambridge, MA.

Biesbroek, GR, P Kabat and JEM Klostermann. 2009. "Institutional governance barriers for the development and implementation of climate adaptation strategies." In *Earth System governance: People, Places and the Planet*. Amsterdam.

Brenkert, A.L. and E.L. Malone. 2005. "Modeling vulnerability and resilience to climate change: a case study of India and Indian States." *Climatic Change* 72(1):57-102.

Brooks, Nick 2003. "Vulnerability, risk and adaptation: A conceptual framework." In *Working Paper 38: Tyndall Centre for Climate Change Research*.

Bruderle, Anna. 2009. "Pasture Land Development." In *Climate Change: Vulnerability & Adaptation. Experiences from Rajasthan & Andra Pradesh*, ed. SDC V&A Programme. Hyderabad, India: SDC.

Bruderle, Anna and Devanshu Chakravarti. 2009. "Community Based Institutions." In *Climate Change: Vulnerability & Adaptation. Experiences from Rajasthan & Andra Pradesh*, ed. SDC V&A Programme. Hyderabad, India: SDC.

Bruderle, Anna, Devanshu Chakravarti and Joseph Plakkootam. 2009a. "Water resource management." In *Climate Change: Vulnerability & Adaptation. Experiences from Rajasthan & Andra Pradesh*, ed. SDC V&A Programme. Hyderabad, India: SDC.

Bruderle, Anna, Shambu Prasad and Shravani Roy. 2009b. "The System of Rice Intensification." In *Climate Change: Vulnerability & Adaptation. Experiences from Rajasthan & Andra Pradesh*, ed. SDC V&A Programme. Hyderabad, India: SDC.

Bruderle, Anna and Othmar Schwank. 2009. "Introduction." In *Climate Change: Vulnerability & Adaptation. Experiences from Rajasthan & Andra Pradesh*, ed. SDC V&A Programme. Hyderabad, India: SDC.

Commission des Communautés Européennes. 2009. "Livre Blanc: Adaptation au changement climatique: vers un cadre d'action européen." ed. Commission des Communautés Européennes.

Conseil d'Etat du Canton de Vaud. 2008. "Rapport du Conseil d'Etat au Grand Conseil sur le postulat d'Olivier Feller et consorts demandant au Conseil d'Etat d'élaborer un plan d'action pour faire face au réchauffement climatique dans les stations d'hiver vaudoises." Lausanne.

Dery, David. 2000. "Agenda Setting and Problem Definition." *Policy Studies* 21(1):37-47.

Dessai, Suraje and Jeroen van de Sluijs. 2007. "Uncertainty and Climate Change Adaptation - a Scoping Study." eds. Copernicus Institute of Utrecht University, Tyndall Centre for Climate Change Research, UK and School of Environmental Sciences and University of East Anglia: Netherlands Environmental Assessment Agency.

- Dovers, Stephen R. and Adnan A. Hezri. 2010. "Institutions and policy processes: the means to the ends of adaptation." *WIREs Climate Change* 1:212-231.
- Dupuis, J. and P Knoepfel. 2011. "Les barrières à la mise en oeuvre des politiques d'adaptation au changement climatique: le cas de la Suisse." *Revue suisse de science politique* 17(1).
- Dupuis, Johann. 2011. "Political barriers to the implementation of climate change adaptation policies: the case of Switzerland." In *IGS-SENCE Conference Resilient Societies - Governing Risk And Vulnerability For Water, Energy And Climate Change*. University Of Twente, Enschede, The Netherlands.
- Eakin, H., E.L. Tompkins, D.R. Nelson and J.M. Anderies. 2009. "Hidden costs and disparate uncertainties: trade-offs involved in approaches to climate policy." In *Adapting to Climate Change: Thresholds, Values, Governance*, eds. W. N. Adger, I Lorenzoni and K O'Brien. New-York: Cambridge University Press.
- ECA. 2009. "Shaping Climate-Resilient Development: A framework for decision-making."
- European Commission. 2007. "Green Paper from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions - Adapting to climate change in Europe – options for EU action."
- European Environmental Agency. 2009. "Regional climate change and adaptation – The Alps facing the challenge of changing water resources." In *EEA Technical report*.
- Faure, Michael G. 2012. "Instruments for environmental governance: what works?" In *Environmental Governance and Sustainability*, eds. Paul Martin, Li Zhiping, Qin Tianbao, Anel Du Plessis and Yves Le Bouthillier. Cheltenham, Northampton: Edward Elgar Publishing.
- Furger, Peter. 2003. "Analyse stratégique sur l'organisation et la gestion des sociétés de remontées mécaniques des Alpes vaudoises: L'avenir des remontées mécaniques des Alpes Vaudoises."
- Füssel, H.M. 2007a. "Adaptation planning for climate change: concepts, assessment approaches, and key lessons." *Sustainability Science* 2(2):265-275.
- Füssel, Hans-Martin. 2007b. "Vulnerability: A generally applicable conceptual framework for climate change research." *Global Environmental Change* 17(2):155-167.
- Gagnon-Lebrun, Frédéric and Shardul Agrawala. 2006. *Progress On Adaptation To Climate Change In Developed Countries: An Analysis Of Broad Trends* Paris: OECD.
- Galston, W.A. 2006. "Political feasibility: interests and power." In *The Oxford handbook of public policy*, eds. Michael Moran, Martin Rein and Robert E. Goodin. Oxford: Oxford University Press.
- Global Environmental Facility (GEF). 2010. "Financing Adaptation Action." GEF.
- Goggin, M.L. 1986. "The" too few cases/too many variables" problem in implementation research." *Political Research Quarterly* 39(2):328.
- Hall, C. Michael. 2011. "Policy learning and policy failure in sustainable tourism governance: from first- and second-order to third-order change?" *Journal of Sustainable Tourism* 19(4-5):649-671.
- Hall, Peter A. 1993. "Policy Paradigms, Social Learning, and the State: The Case of Economic Policymaking in Britain." *Comparative Politics* 25(3):275-296.
- Hill, Michael and Peter Hupe. 2009. *Implementing public policy: An introduction to the study of operational governance*. London: Sage Publications Ltd.
- Hoppe, R., H. Van de Graaf and A. van Dijk. 1987. "Implementation research and policy design: problem tractability, policy theory, and feasibility testing." *International Review of Administrative Sciences* 53(4):581-604.

- Hulme, P. E. 2005. "Adapting to climate change: is there scope for ecological management in the face of a global threat?" *Journal of Applied Ecology*(42):784-794.
- Ingram, H., A.L. Schneider and P. DeLeon. 2007. "Social construction and policy design." In *Theories of the policy process*, ed. Paul Sabatier: Westview Press.
- IPCC. 2007. "Glossary of Terms used in the IPCC Fourth Assessment Report (Synthesis report)." In *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson. Cambridge, UK: Cambridge University Press.
- Keskitalo, E. Carina H. 2010. *Developing Adaptation Policy and Practice in Europe: Multi-level Governance of Climate Change*. Dordrecht. Heidelberg, London, New-York: Springer.
- Knoepfel, Peter, C Larrue, F Varone and M Hill. 2011. *Public policy analysis*. Bristol: The Policy Press.
- Lipsky, M. 2010. *Street-level bureaucracy: Dilemmas of the individual in public services*: Russell Sage Foundation Publications.
- Marsh, D. and A. McConnell. 2010. "Towards a framework for establishing policy success." *Public Administration* 88(2):564-583.
- Massey, E. and E. Bergsma. 2008. "Assessing adaptation 27 European Countries." Amsterdam: IVM.
- Massey, Eric E. 2009. "Adaptation Policy and Procedures in Central & Eastern Europe." Amsterdam: Netherlands Environmental Assessment Agency (PBL).
- Matland, R.E. 1995. "Synthesizing the implementation literature: The ambiguity-conflict model of policy implementation." *Journal of public administration research and theory* 5(2):145.
- Mazmanian, Daniel and Paul Sabatier. 1983. *Implementation and Public Policy*. Chicago: Scott Foresman and Co.
- McGray, H, A Hammill, R Bradley, EL Schipper and JE Parry. 2007. *Weathering the storm: options for framing adaptation and development*: World Resources Institute (WRI),.
- Modoux, Francois. "Alpes vaudoises, le grand chambardement." In *Le Temps*. Genève: Edipresse.
- Moser, Susanne C. and Julia A. Ekstrom. 2010. "A framework to diagnose barriers to climate change adaptation." *Proceedings of the National Academy of Sciences*.
- Müller, Hansruedi. 2011. *Der Schweizer Tourismus im Klimawandel*. Bern: Staatssekretariat für Wirtschaft SECO.
- Nambi, A. A and T.N Balasubramanian. 2009. "A Weather-based Farming Model for Communities." In *Climate Change: Vulnerability & Adaptation. Experiences from Rajasthan & Andra Pradesh*, ed. SDC V&A Programme. Hyderabad, India: SDC.
- O'Brien, K, S Eriksen, A Schjolden and L Nygaard. 2004a. "What's in a word: Conflicting interpretations of vulnerability in climate change research. ." *CICERO Working Paper* 4.
- O'Brien, K, L Sygna and JE Haugen. 2004b. "Vulnerable or resilient? A multi-scale assessment of climate impacts and vulnerability in Norway." *Climatic Change* 64(1):193-225.
- O'Brien, K., S. Eriksen, L.P. Nygaard and A. Schjolden. 2007. "Why different interpretations of vulnerability matter in climate change discourses." *Climate Policy* 7(1):73-88.
- OcCC. 2007. *Klimaänderung und die Schweiz 2050*. Bern: OcCC.
- OcCC. 2008. *Das Klima ändert – was nun?* Bern: OcCC.
- OCDE. 2007. "Climate Change in the European Alps: Adapting Winter Tourism and Natural Hazards Management." ed. Shardul Agrawala. Paris.

OFEV. 2011. "Stratégie suisse d'adaptation aux changements climatiques : Rapport intermédiaire au Conseil fédéral." Bern.

Parsons, W. 1995. *An Introduction To The Theory And Practice Of Policy Analysis*: Edward Elgar.

Pressman, J.L. and A. Wildavsky. 1984. *Implementation: how great expectations in Washington are dashed in Oakland: or, why it's amazing that federal programs work at all, this being a saga of the Economic Development Administration as told by two sympathetic observers who seek to build morals on a foundation of ruined hopes*: Univ of California Pr.

Rajasree, Ray. 2008. "Adaptation Activities In India." *Development Outreach* 10(1):18-21.

Rao, K. Bhavana. 2010. *Agriculture market price fluctuations, changing livestock systems and Vulnerability connect - a case of Mhaswandi watershed, Ahmednagar district, Marahstra*: WOTR.

Ripley, R.B. and G.A. Franklin. 1982. *Bureaucracy and policy implementation*: Dorsey Press Homewood, IL.

Rochefort, D. A. and Roger W. Cobb. 1994. *The politics of problem definition: shaping the policy agenda*. Kansas: University Press of Kansas.

Sabatier, PA. 1986. "Top-down and Bottom Up Approaches to Implementation Research: A Critical Analysis and Suggested Synthesis." *Journal of Public Policy* 6(1):21-48.

Schneider, A. and H. Ingram. 1993. "Social construction of target populations: Implications for politics and policy." *American Political Science Review*:334-347.

Schneider, A.L. 2006. "Patterns of change in the use of imprisonment in the American states: An integration of path dependence, punctuated equilibrium and policy design approaches." *Political Research Quarterly* 59(3):457-470.

Schneider, S and Janica Lane. 2006. "Dangers and Treshold in Climate Change." In *Fairness in Adaptation to Climate Change*, eds. W.N Adger, Paavola. Jouni, S. Huq and M.J. Mace. Cambridge: Massachussetts Institute of Technology Press.

Schwarze, Reimund and Onno Hoffmeister. 2010. "The Winding Road to Industrial Safety: Evidence on the Effects of Environmental Liability on Accident Prevention in Germany." *The Geneva Papers* 35(3):416-434.

SDC. 2009. *Proposition de crédit: WOTR-SDC Partnership for Climate Change Adaptation*. Dehli, Bern: SDC.

SDC V&A Programme. 2005. "Vulnerability Assessment And Enhancing Adaptive Capacity To Climate Change In Semi-Arid Areas In India: A New Phase of the Project on Structural Transformation Processes/Capacity Building in Climate Change/India." Bern: SDC.

SELT. 2006. "Rapport sur les axes stratégiques du tourisme vaudois." ed. SELT. Lausanne: Canton de Vaud.

Smit, B, I Burton, R.J.T Klein and J Wandel. 2000. "An Anatomy of Adaptation to Climate Change and Variability." *Climatic Change* 45:223–251.

Smit, B, O Pilifosova, I. Burton, R.J.T. Klein, B. Challenger, S. Huq and G. Yohe. 2001. "Adaptation to climate change in the context of sustainable development and equity." In *Climate change 2001: impacts, adaptation, and vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change*, eds. J.J McCarthy, O.F Canziani, N.A Leary, D.J Dokken and K.S White. Cambridge: Cambridge University Press.

Swart, Rob, Robbert Biesbroek, Svend Binnerup, Timothy R. Carter, Caroline Cowan, Thomas Henrichs, Sophie Loquen, Hanna Mela, Michael Morecroft, Moritz Reese and Daniela Rey. 2009. "Europe Adapts to Climate Change Comparing National Adaptation Strategies." In *PEER Report No 1: Partnership For European Environmental Research*.

True, James L., Bryan D. Jones and FR Baumgartner. 2007. "Punctuated-equilibrium theory. Explaining stability and change in public policymaking." In Theories of the policy process, ed. Paul Sabatier: Westview Press.

UNDP. 2010. A Toolkit for Designing Climate Change Adaptation Initiatives: UNDP.

Ungar, S. 1992. "The rise and (relative) decline of global warming as a social problem." Sociological Quarterly:483-501.

Webber, D.J. 1986. "Analyzing political feasibility: political scientists' unique contribution to policy analysis." Policy Studies Journal 14(4):545-553.

Wolf, J. 2011. "Climate change adaptation as a social process." In Climate Change Adaptation in Developed Nations, eds. James D Ford and Lea Berrang-Ford.

WOTR. 2011. What are we in for - Rural dynamics in the context of Climate Change - a look at Ahmednagar district. Pune: WOTR,.

Yohe, G, E Malone, A Brenkert, M Schlesinger, H Meij, X Xing and D Lee. 2006. "A synthetic assessment of the global distribution of vulnerability to climate change from the IPCC perspective that reflects exposure and adaptive capacity." CIESIN (Center for International Earth Science Information Network), Columbia University, Palisades. <http://ciesin.columbia.edu/data/climate/> Access date July 8:2008.

## **Annex 1: List of interviewees**

### India:

Rupa Mukerji, co Head Advisory Services, Helvetas ex Intercooperation India

Raj Zagade, WOTR Officer, Sangamner

Othmar Schwank, President Schwank Earthpartner Ltd.

K.R. Vishwanathan, Senior Advisor, Swiss Agency for Development and Cooperation

Sushil Bajpai, Director WOTR

Crispino Lobo, Cofounder of WOTR

S. Parthasarathy, IAS (retired), ICRISAT (former assistant director general)

K. Venkateswara Rao, General Manager, NABARD, Maharashtra Regional Office

P. Satish, Chief General Manager NABARD, Maharashtra Regional Office

X, XXXX, Department of Agriculture, Government of Maharashtra

### Switzerland

S. Mordasini, Project Leader SELT, Etat de Vaud

L. Eperon, Director SELT, Etat de Vaud

R. Hohmann, Scientific Officer, Federal Office for the Environment

P. Furger, Director Dr. Furger Peter AG

F. Sartori, Vice-Director, Ski lift Companies Switzerland

T. Egger, Director Swiss Working Group on Mountainous area

M. Trombitas, Swiss Tourism Federation

P. Solms, Project Leader, Touristic community of the Alps Vaudoises

A. Hefti. President TeleLeysin AG

J-M. Udriot, Mayor, Leysin