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BACKGROUND PAPER TO THE 2010 WORLD DEVELOPMENT REPORT

# Climate Change and Individual Behavior

## Considerations for Policy

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## Abstract

Climate change is anthropogenic—the product of billions of acts of daily consumption. That solutions need to be anthropogenic too is well accepted. Yet, suggested solutions are normally cast in the realms of finance and technology, often neglecting the primal root of the problem: individual behavior. An emerging body of

social-psychology scholarship has examined the barriers and drivers of individual behavior in relation to both adaptation and mitigation. This paper reviews some of its conclusions, and suggests policy areas that should be considered in devising appropriate interventions.

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## **Climate change and individual behavior: Considerations for policy**

by Andrea Liverani<sup>1</sup>

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## **1. Introduction**

Climate change is anthropogenic - the product of billions of acts of daily consumption. That solutions need to be anthropogenic too is well accepted. Normally cast in the realms of finance and technology, suggested solutions often neglect the primal root of the problem: individual behavior. A broad amount of social-psychology scholarship has examined the barriers and drivers of individual behavior in relation to both adaptation and mitigation. This paper reviews some of its conclusions, and suggests policy areas that should be considered in devising appropriate interventions. Let's start from what separates awareness, concern and action.

## **2. Climate change and behavior change**

There are three main reasons why the drivers of human behavior are important for climate policy. First, myriad private acts of consumption are at the root of the climate change challenge. As consumers, individuals hold a reservoir of mitigation capacity. Roughly 40 percent of OECD emissions result from decisions by individuals—travel, heating, and food purchases. U.S. households directly account for roughly 35 percent of national CO<sub>2</sub> emissions - more in absolute terms than the entire U.S. industrial sector and any other country bar China. If adopted, existing efficiency measures for households and motor vehicles can allow energy savings of almost 30 percent— 11 percent of total U.S. consumption.<sup>2</sup> Second, individuals are the drivers of larger processes of change involving organizations and political systems. Particularly in democratic countries, government action is the result of public pressures to act by citizens and voters. Third, policy decisions are taken by individuals subject to standard mental processes.

So far, the debate about changing individuals' behavior has focused on market mechanisms. Better pricing of energy and costing of scarce resources can indeed steer individuals away from carbon-intensive consumption, encourage them to preserve endangered habitats, and better manage eco-systems. But the drivers of consumption behavior by individuals and groups go beyond prices. Many energy efficient technologies have been available for years. “No-regret” investment decisions that yield benefits irrespective of climate change are available for both mitigation and adaptation. Improving building insulation, addressing water leakages, and limiting urbanization in flood-prone areas are good examples. The trick is to grasp why adoption has not taken place.

## **3. Concern does not mean understanding**

Global awareness of climate change has constantly increased without translating into individuals' actions.<sup>34</sup> Indeed, together with “awareness, flying, driving, holidaying abroad and using household appliances have also increased globally.<sup>5</sup> What explains the

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<sup>2</sup> Gardner and Stern 2008.

<sup>3</sup> Bannon and others 2007; New Scientist 2007.

<sup>4</sup> Leiserowitz 2007; Brechin 2008; Sterman and Sweeney 2007.

<sup>5</sup> IPPR 2008; Retallack, Lawrence, and Lockwood 2007 .

disconnect between perceptions and actions? Concern about climate change does not necessarily mean understanding of its drivers and dynamics, nor of the responses needed. Polls show that the public admits to remaining confused over climate change's causes and solutions.<sup>6</sup> This "green gap" in public attitudes partly stems from how climate science is communicated and how our minds' (mis)understand climate dynamics.<sup>7</sup>

Standard information-deficit models assume that if people "know," they act differently.<sup>8</sup> Public opinion is today exposed to considerable amounts of information on the causes, dynamics and effects of climate change. This information clearly increased concern, but did not necessarily lead to action.<sup>9</sup> Information can lead to misleading feelings of "empowerment" (you can change the course of nature; the fate of the world depends on switching the light and using less air conditioning) which then turns into ambivalent powerlessness when paired with more "realistic" messages. Conveying a sense of urgency by stressing the unprecedented nature and scale of the problems implies a lack of available models to learn from, encouraging paralysis.<sup>10</sup> Similarly, playing up the multi-stakeholder nature of adaptation is a reminder that the solution rests with no single actor, resulting in a generalized feeling of limited agency, helplessness, and disempowerment<sup>11</sup>. This might explain why, in developed countries where information on climate change is more available, citizens are less optimistic about a possible solution.

To lead to action, awareness needs to be grounded in information from clear and trustworthy sources. Scientific debate evolves through testing and crosschecking of theories and findings. This can lead news coverage to veer from one extreme to another, resulting in additional confusion for the public, who may perceive this not as scientific progress but as a proliferation of contradictory opinions. Media framing can be confusing or even misleading.<sup>12</sup> The journalist's need to present "balanced" stories has given disproportionate coverage to climate science contrarians lacking comparable scientific expertise and standing.<sup>13</sup> The message can also contribute to enabling or disabling the possibility of action. The media shy away from the scientific community's careful wording to express uncertainty in search of punchier stories. The reader then faces messages lacking scientific caution and containing strong appeals that might be then refuted by other similarly strongly worded statements, hampering the perceived reliability of the information source. In addition to confusing the public (and policymakers) about import, causes, and potential solutions, different types of framing can antagonize individuals and induce a sense of guilt and vilification, as when the

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<sup>6</sup> Wimberly 2008; Accenture 2009.

<sup>7</sup> Norgaard 2006; Jacques, Dunlap, and Freeman 2008.

<sup>8</sup> Bulkeley 2000.

<sup>9</sup> Kellstedt, Zahran, and Vedlitz 2008.

<sup>10</sup> Immerwahr 1999.

<sup>11</sup> Krosnick and others 2006.

<sup>12</sup> Boykoff and Mansfield 2008.

<sup>13</sup> Oreskes 2004; Krosnick 2008.

problem of consumption turns into a problem of consumers.<sup>14</sup> This can lead to rejecting the message, rather than acting upon it.

An added challenge in moving from concern to understanding has to do with how the mind perceives the problem. The dynamics of climate change stretch our mental capacities in several ways.<sup>15</sup> Psychological research shows that individuals are ill equipped to deal with multiple-cause problems.<sup>16</sup> Simplifying by adopting single-cause explanations in turn leads to searching for individual solutions and focusing on (often nonexistent) easy technological silver bullets. The inertia affecting adaptation responses can be linked to our incapacity to understand stock-and-flow relationships of the kind governing GHGs concentration, removal, and stabilization. The fact that even the most drastic and sudden emissions reductions will not prevent further warming and make the need for adaptation disappear in the short and medium terms is something we struggle with, and without careful explanation, simply do not understand.<sup>17</sup>

#### **4. Understanding does not lead to action**

Secondly, understanding does not always lead to action. Knowledge is mediated through value systems shaped by psychological, cultural, and economic factors that determine whether we act or not. Again, the idea here is not that individuals are not rational, but that we need to understand better how we make decisions. Our evolution as a species has shaped the way our brains work and explains why we set priorities and act on certain issues and overlook others. We are particularly good at acting upon threats that can be linked to a human face—that present themselves as unexpected, dramatic and immediate, rather than problems which emerge and develop slowly and gradually—that present obvious links to human health—that challenge our moral framework involving visceral reactions—that are spurred by recent personal experience.<sup>18</sup> The slow-changing quality of climate change, as well as the delayed, intangible, and statistical nature of its risks, simply do not “move us”.

Behavioral economics shows that features of human decisionmaking under uncertainty tend to constrain our instinct to adapt.<sup>19</sup> We underestimate cumulative probabilities (the sum of the probabilities of an event occurring over a period of time), which explains why building continues in areas prone to fires, flooding, and earthquakes. We strongly favor the status quo, and agree only to make small incremental adjustments to it. We are at loss when the lack of a clear counterfactual makes measuring achievements difficult because, as in disaster preparedness. We are “myopic decisionmakers” who strongly discount future events to assign higher priorities to spatially and temporally closer problems. For instance, the public tends to be mobilized by “visible” environmental problems (urban air

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<sup>14</sup> Miller 2008.

<sup>15</sup> Bostrom and others 1994.

<sup>16</sup> Bazerman 2006.

<sup>17</sup> Sterman and Sweeney 2007.

<sup>18</sup> Ornstein and Ehrlich 2000; Weber 2006.

<sup>19</sup> Repetto 2008.

pollution) and not by less visible ones (groundwater pollution). Sporadic events generate less concern than their probability warrants on average, but more than they deserve in those rare instances they occur (people get frantic if a bridge collapses, but neglect investing in maintenance). These tendencies are confirmed by polls showing that individuals rank climate change lower than other environmental issues closer to home.<sup>20</sup>

Even if we were indeed fully rational, knowledge would not necessarily lead to action.

- First, our “finite pool of worries” might prevent us from acting on existing information because we prioritize between a set of needs.<sup>21</sup>
- Second, we assess both market *and* nonmarket costs of our decisions. For individuals called on to engage with adaptation options challenge core value systems related, say, to traditional sources of livelihoods, culture, and identity (such as calls for resettlement and migration, or switching from traditional crops and farming customs to new climate-resilient agricultural practices).nonmarket costs can be high—particularly when
- Third, the very act of ‘interpreting’ or ‘mediating’ adaptation needs is costly. To make rational decisions, individuals and communities facing adaptation choices incur transaction costs collecting and interpreting new and additional information. For a household having to decide whether to keep rebuilding on a flood-prone area, these costs can be real and substantial. The same can be said for a local authority official in charge of designing and enforcing building codes in low-lying coastal areas. When the interpretation and decisionmaking costs are excessive, individuals can fail to act on available and already registered information.
- Fourth, problems of mitigation—and, very often, adaptation—present themselves as tragedies of the commons requiring collective action. Rational and self-interested individuals notably face structural disincentives to cooperate in solving these problems.<sup>22</sup>
- Fifth, game theory shows that cooperation in these conditions requires the payoffs to be clear, obviously not the case with climate change impacts and responses.<sup>23</sup>

Understanding barriers to behavior change also requires going beyond psychological explanations based on the individual as a unit of analysis and embrace the way social factors influence perceptions, decisions, and actions. People naturally tend to resist and deny information that contradicts their cultural values or ideological beliefs, such as information challenging notions of belonging and identity, but also of rights to freedom and consumption. Notions of “needs” and priorities deriving from them are socially and culturally constructed.<sup>24</sup> This might explain why awareness of environmental problems normally increases with levels of wealth, but not for concern about climate change.<sup>25</sup>

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<sup>20</sup> Moser and Dilling 2007; Nisbet and Myers 2007.

<sup>21</sup> Maslow 1970.

<sup>22</sup> Olson 1965; Hardin 1968; Ostrom 2009.

<sup>23</sup> Irwin 2008.

<sup>24</sup> Winter and Koger 2004.

<sup>25</sup> Sandvik 2008.

Individuals (and nations) with higher incomes (and/or higher carbon dioxide emissions) seem to present a cognitive tendency to disregard global warming as a way to avoid incurring the costs of emissions.<sup>26</sup>

People also construct and reconstruct information to make it less uncomfortable, leading to strategies of socially organized denial that shape the way societies and governments interpret and respond to the challenges of climate change.<sup>27</sup> The evolution of standard narratives about climate change provides an example. Focusing on country emissions rather than per capita emissions can lead individuals living outside the big emitters to minimize their own responsibility and rationalize their failure to act. Drastic calls for the need for an international response tend to play down the fact that domestic action will be required in any case. And uncertainty about dynamics and impacts can be overplayed to justified inaction.

These forms of denial are not abstract. Nor are they confined to climate change mitigation and adaptation. Similar processes operate at various levels of individuals' day-to-day decisionmaking, and addressing them is part of solving crucial development challenges, such as reducing the spread of HIV-AIDS or the incidence of common water and sanitation related diseases. Rather than an aberration, denial needs to be considered as a coping strategy deployed by individuals and communities facing unmanageable and uncomfortable events. Forms of resistance to adaptation and mitigation choices are almost never simply the result of ignorance. Instead, they result from individual perceptions, needs, and wants based on both material and cultural values.

## **5. Encouraging behavioral change**

Policymakers need to be aware of these barriers to action, and treat policy options accordingly. Three policy areas are relevant here: communications, institutional measures, social norms.

*From information to communication.* Information, education, and awareness raising, as carried out so far, are at best not enough and at worst counterproductive. Three recommendations for a different approach in coverage of climate change.<sup>28</sup> First, creating the right communication opportunities and avenues to communicate requires more interaction between journalists and scientists. Second, communicating climate change needs to shift away from an information-driven approach to a reader-centric one. Both scientists and the media need to work together on enhancing the salience of the messages they relay. As in other policy areas, such as AIDS prevention, this entails using a “marketing” approach to communication, where the individual is not merely the passive receiver of information but an active agent in both causes and solutions. Well designed climate communication campaigns that address individuals as members of a local

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<sup>26</sup> O'Connor and others 2002; Zahran, Kellstedt, and Vedlitz 2008; Norgaard 2006; Moser and Dilling 2007; Dunlap 1998.

<sup>27</sup> Norgaard 2009.

<sup>28</sup> Ward 2008.

community—and not powerless members of an unmanageably large group—can empower them to act. This can help make a long-drawn, global phenomenon personally relevant and immediately newsworthy and accentuate the local and individual ownership of the solutions local. Third, greenwash from business and government—the gap between agreeing publicly on the reality of climate change while doing nothing about it—needs to be limited to avoid public confusion and public backlash.

A key and controversial question is whether detailed public understanding of highly complex issues such as global warming is actually feasible, and even necessary, for effective policymaking. The answer is no, or at least not always. Much policymaking is based on technicalities fully ignored by the public. Few people understand the intricacies of trade policies affecting the price of the food they buy and eat, or produce and sell. Where buy-in is necessary, it is often encouraged through other means.

Yet discounting information and public awareness as unnecessary would be a mistake. Recent work has highlighted that information is key for the public to back costly measures. The benefits of providing more accurate information about people's consumption decisions—say, through carbon labeling and smart meters—have long been proven. A US-based survey found that one of the main factors responsible for the public's negative perceptions of cap and trade schemes is not fear of additional costs but rather limited knowledge of its effectiveness, reducing public trust in them.<sup>29</sup> Similarly, opposition to environmental taxes seems to decrease once the public fully understands that they are a way not simply to raise money, but to change behavior and reduce a negative externality.<sup>30</sup>

*Institutional measures.* Beyond communication, a key question for climate policy is to design interventions that take into account psychological and social constraints to positive action. The design of effective adaptation interventions should include institutional measures reducing the transaction costs for individuals in making decisions while enhancing the ownership of the information available. This would require adaption strategies to be informed by communities' own perceptions of risk, vulnerability, and capacity. The institutionalization of participatory self-assessments for national and local disaster preparedness, adaptation planning, and mitigation targets can be useful in this.

Measures to limit individuals' tendency to discount the future are another area of action. Although discounting the future is an innate and internal mental quality, it varies in accord with social characteristics and external stimuli. Evidence from Peru shows higher discounting associated with higher incentives to deforest and lower incentives to invest in reforestation. Farmers with limited access to credit and insurance and weak property rights security will have higher discount rates.<sup>31</sup> Institutional reforms aimed at improving credit access and property rights can affect inner behavioral drivers of discounting.

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<sup>29</sup> Krosnick 2008.

<sup>30</sup> Kallbekken, Kroll, and Cherry 2007.

<sup>31</sup> Swallow and others 2007.

Similarly, interventions relying on individuals and businesses facing initial up-front costs with long-term benefits (such as those typical of energy efficiency investments) should consider the provision of immediate payoffs in the form of fiscal rebates or subsidies. Giving private actors a sense of long term policy direction is also useful. A 2007 international survey of business leaders found that 81 percent of those polled believed that government needs to provide clear long-term policy signals to help companies find the incentives to change and plan investments.<sup>32</sup> (How government can ensure long-term direction is explored below.)

Climate policy should also heed individuals' tendency to favor local, visible, and privately securable outcomes. Mitigation actions produce global and diffuse benefits. To most, the benefits of adaptation are distant, abstract, and uncertain, while its actual and associated costs are usually immediate, concrete, and certain. Interventions can be devised to better highlight upfront the 'ancillary' benefits. For instance, altering cost-benefit tools can encourage public and private decisionmakers to act more decisively.

The estimation of costs and benefits of energy-efficiency projects often do not include nonenergy co-benefits. These include public health benefits from cleaner air and water, improved comfort of building occupants, increased labor productivity<sup>33</sup> and increased jobs through the multiplier effects of switching energy expenditure.<sup>34</sup> Evidence based on case studies in manufacturing concludes that these benefits can be considerable, and sometimes equivalent to the value of the energy savings alone.<sup>35</sup> The result is that the timeframe for investment paybacks can fall substantially, providing a better incentive to invest. Similarly, earmarking revenues from carbon or energy taxes should be considered as a way to increase the visibility of benefits of mitigation. Although fiscal earmarking is deemed to be economically inefficient, it helps achieve political acceptance of new taxes, because the public sees clearly where the money goes.

*Social norms.* Social norms are established patterns of behavior that most people approve of—or the yardstick individuals use to assess the appropriateness of their own behavior. As they shape human action, social norms can achieve socially desirable outcomes, generally at a fairly low cost. The basic idea is that individuals want to act in a socially acceptable way. We tend to follow the lead of others, particularly when the others are numerous and appear similar to them.

Social norms have a particularly strong impact on recipients under conditions of uncertainty.<sup>36</sup> Rather than look for clues about how to behave when unsure about conduct and outcomes, people rely on what others do. Evidence from different environmental contexts shows that social norm-based appeals for pro-environmental

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<sup>32</sup> Clifford Chance 2007.

<sup>33</sup> Romm and Ervin 1996.

<sup>34</sup> Roland-Holst 2008.

<sup>35</sup> Laitner and Finman 2000.

<sup>36</sup> Cialdini and Goldstein 2004; Schultz and others 2007.

behavior are superior to traditional persuasive appeals. Littering is a good example of an act generally induced or restrained by group behavior.

A more climate-relevant example comes from a psychological experiment conducted on California residents to check for the impact of social norms on energy consumption.<sup>37</sup> The average household energy consumption was communicated to one group of high energy households and two groups of low energy households. This set the social norm. One group of low-energy households received positive feedback for their energy consumption statement (a smiley), conveying approval of their energy footprint. High consumption households were shown their energy use coupled with negative feedback (sad face) to convey disapproval. The result was that high energy households reduced consumption, and low energy ones maintained their lower than average consumption. Importantly, the third group of low energy households who were initially exposed to the social norm, but received no positive feedback about their behavior, increased their consumption to reach the average.

Harnessing the power of social norms implies increasing the “visibility” of behavior and its implications. Individual decisions and actions that have a bearing on energy consumption today are largely invisible to the public and even to restricted circles of family and friends. In these cases human agency cannot benefit from patterns of reciprocity, peer pressure and the group behavior normally at play in more visible cases of behavior change and compliance, such as in traffic control.

Research on cooperation leads to the same conclusion. Unless information about other ‘players’ behavior is available, people tend to ‘defect’ from cooperation.<sup>38</sup> Farmers in a specific river basin should be given information not only about their water use, but also whether they are below or above the standard set by their peers. Residents of flood-prone areas can be encouraged to adopt protection measures by exposing them to the rapid uptake of such measures in their community. Conversely, appeals stressing that too many people have not yet installed basic energy efficiency measures are bound to lead to even less, not more, adoption of such measures.

The use of social norms has traditionally been neglected in public policy in favor of more standard measures, such as regulation, taxation, and pricing. Thinking in terms of group behavior can help ameliorate the impact of these measures, opening opportunities for combining different instruments. But some policies based on economic incentives might do more harm than good by weakening the effect of social norms. Pricing pollution or emissions might give polluters the impression that they *can* pollute. Similarly, imperfectly enforced regulation, or perceptions that formal rules can be eluded, can break down the power of social norms in favor of more self-interested behavior and weaken cooperation.<sup>39</sup>

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<sup>37</sup> Cialdini and Goldstein 2004; Corner 2008.

<sup>38</sup> Irwin 2008.

<sup>39</sup> Irwin 2008.

More radical ideas about the potential use of social norms to address climate change call social norms focused on alternative parameters of progress, such as those stressing a shift toward notions of well being decoupled from levels of consumption.<sup>40</sup> Consumer-based incentives that reward positive behaviors rather than simply sanction bad ones have been suggested as a way to encourage such a shift. For instance, a carbon foot print tax could be levied on consumer goods and products. The revenue from such a tax would be equally rebated to consumers through a tax credit. The tax would encourage producers to reduce the carbon footprint of their products. High carbon consumers would pay a penalty, while low carbon users would end up better off because of the net effect of the tax rebate. In addition to lowering carbon emissions directly, the carbon footprint would have an indirect effect on overall consumption. As income is redistributed from (likely wealthier) high carbon users to (likely poorer) low carbon users, overall consumption aspirations will likely be lowered.<sup>41</sup>

These measures are obviously not sufficient to ensure the success of climate policy. But they might well prove to be necessary. Encouraging behavior change for mitigation and adaptation goes well beyond providing additional information, finance, or technology. Traditional measures can be completed by alternative types of interventions, often at low cost. Rather than simply treat these social and psychological drivers of behavior as barriers to adaptation and mitigation, policymakers have the option to use them to build more effective and sustainable policies and interventions.

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<sup>40</sup> Layard 2005.

<sup>41</sup> Cohen and Vandenberg 2008.

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