Stakeholder Consultation

with

Civil Society/Non Governmental Organizations

FAO Headquarters, Rome, 15-16 February 2008

Introduction

Stakeholder consultations were held as part of the process of preparation for the High Level Conference on World Food Security: the Challenges of Climate Change and Bioenergy, Rome on 3-5 June 2008. The stakeholder consultations solicited broad views and experiences from civil society organizations and from the private sector on the impact of climate change and the growth of bioenergy on food security.

The civil society and non-governmental organizations (CSOs/NGOs) consultation was held from 15-16 February 2008, in connection with the Farmers' Forum organized by the International Fund for Agricultural Development (IFAD) on 11-12 February 2008. It was attended by 91 participants from 66 organizations representing farmers' organizations, environmental and development NGOs, indigenous peoples' organizations, human-rights based-organizations, women's organizations, international NGO networks and academic institutions.

World food security and climate change

Agriculture is adversely affected by climate change. World food security relies on agriculture which has, to a large extent, been negatively affected by climate change. In fact, according to some participants, agriculture is a "victim" of climate change.

Projections indicate that the impact of climate change on agriculture will continue to worsen and the burden of this will be felt especially by poor people, most of whom live in the rural areas of Africa and Asia. The primary interest of the world's poor, who are also its most food insecure as well as the most affected by climate change, is food availability.

The impact of climate change is and will become increasingly severe on farmers, peasants, indigenous peoples, pastoralists, fisherfolk and women. It affects current conditions of and their access to resources, including land, water and seeds, as well as their capacity to apply acquired knowledge. Therefore, there is a need to consult with smallholders and the resource poor and their own organizations, build on their local knowledge and experiences, and stimulate the introduction of appropriate technology, including indigenous practices, and technical options at the local level in order to help them face the challenges of ensuring food security in a changing climate.

Several participants promoted the Right to Food which should be at the heart of policies addressing food security and climate change principles. The Human Rights Council is taking a human rights-based approach in addressing climate change.

Climate change already has caused, among other factors, mass migration from rural to urban areas, affecting the rural labour force. Proposals to concentrate adaptation of developing country agriculture on large productive units, forcing small farmers to migrate to urban areas, are not acceptable and alternatives must be sought that will help retain these farmers in rural areas as much as possible.

Agriculture contributes to greenhouse gas emissions but also sequesters carbon. The agriculture sector is said to be responsible for more than 30 percent of all global human-induced greenhouse gas (GHG) emissions. The industrial, corporate-driven model of agricultural production is one of the key contributors to the increase in GHGs in the agricultural sector. On the other hand, well managed subsistence systems and ecologically-managed agro-ecosystems not only promote sustainable agriculture and land use, they can contribute to reducing GHG emissions.

Grasslands have an enormous capacity for carbon sequestration. In particular, well-managed grasslands have the potential for both storing and sequestering carbon and ensuring capture rainfall and retention of soil water, thus contributing to mitigation of and adaptation to climate change. The Intergovernmental Panel on Climate Change (IPCC) has acknowledged the importance of improved grazing practices as a key strategy for restoring grasslands' fertility while building carbon sinks.

Agricultural biodiversity in the face of climate change. Adaptation of agriculture is essential for mitigation of the effect of climate change, but this can only be achieved by maintaining a thriving agricultural biodiversity and its associated ecosystem functions. The management of agricultural biodiversity, commonly practiced among local family and peasant farmers, pastoralists and artisanal fisherfolk, is essential – and should be a primary focus for creating adaptation measure that incorporate ecosystem functions.

Agricultural biodiversity refers to the diversity of all species above and below the ground and in aquatic systems that have been developed and conserved over the millennia by rural women and men to provide food, vegetation cover and natural fibres. Rural people provide, support and are dependent on thriving ecosystems functions – not economic "ecosystem services" but biological "ecosystem functions" that are essential for providing healthy food, securing livelihoods and sustaining life on earth. High priority needs to be given to the conservation and development of agricultural biodiversity – on farms by small-scale farmers, on the range by pastoralists, inland and in coastal waters by artisanal fisherfolk – so they can maintain a broad diversity of species, varieties and breeds essential for underpinning food sovereignty, sustainable farming and food production systems.

In the face of climate change, there is a need for supporting policies and practices that will facilitate an increase in exchange of seeds, livestock breeds and other genetic resources for food and agriculture, among communities, countries and continents. Yet, existing policies, laws, treaties, commercial contracts and technologies increasingly prevent seed saving, local livestock breeding and limit exchanges of seeds and livestock.

Importance of local knowledge. Local methods of agricultural production have climate adaptation and mitigation potential. Peasant-based, low-input agriculture, herding/pastoralism and artisanal fisheries provide key solutions for reducing climate gases because they use very limited amounts of fossil fuels while sustaining livelihoods.

There is a need to capitalize on local knowledge and experiences in devising appropriate technologies, and mitigation and adaptation options for smallholders and resource-poor farmers. FAO can greatly facilitate exchanges of experience among rural people and enhance the mutual benefits and synergies between traditional and scientific knowledge.

Smallholders and other producers possess substantial knowledge and livelihood strategies that can help them face climate change and offer solutions to the planet's climate change-related problems.

There is a need to document the roles of pastoralists, the different systems of livestock production and the benefits of open-range production, with a view to sharing and scaling-up best practices.[1] The role of grasslands and open-range systems could form part of sustainable livelihood systems of local communities while contributing to carbon sequestration, water replenishment, biodiversity conservation, and ecosystem stability and sustainability. In addition, existing knowledge accumulated by grassroots organizations that have been working on climate change for many years, such as traditional drought resistant crops, should be utilized.

Nevertheless, most small farmers have not had access to either climate modelling or scientific advances, nor have they been invited to contribute their insights to such processes. Support is needed from the international community to amplify small farmer's opportunity to participate and to take responsibility in climate change strategies, because the speed and extensive scale of impacts of climate change is beyond farmers' own coping strategies and application of their traditional knowledge.

---

[1] For an example of pastoralists' coping strategies in the face of increasing droughts see *Pastoral Crisis in Successive Drought. Case Study (Ngorongoro Conservation Area, Tanzania,* Indigenous Heartland Organization*).*

Food security and bioenergy

Distinguishing bioenergy from biofuel. It is important to distinguish biofuel from bioenergy. Biofuel essentially refers to liquid fuels used for transport and energy generation. Bioenergy is a broader term, incorporating different kinds of energy and sources in rural areas (such as fuelwood or small-scale community energy production), which have always been essential to household and local community needs.

Food security and use of land for biofuels. A major concern regarding the development of biofuels is the fact that it competes with the use of land and water for food production and can have a negative impact on food security. Participants requested FAO to make food security the priority, rather than promote alternative land and water uses for biofuels that put food availability at risk for the most vulnerable.

Conversions and concentration of land for bioenergy production already have modified land- use systems and land ownership, as well as labour rights, with significant negative impacts on smallholders and the poor in rural areas. Biofuel production also puts a strain on water resources. In fact, present combinations of government support and private investments in the production of biofuels are dispossessing people of their land. This, combined with their putting public land once used by rural populations to non-sustainable and non-biodiverse agricultural use, including converting forests to feedstock plantations, puts biodiversity at risk.

Biofuels must not diminish the rights of the communities over land. Most of the rural poor base their livelihoods also on marginal land. It is their Right to Food.

Biofuel production must not come at the expense of biodiversity or natural resources on which indigenous communities and rural communities depend. The enormous need for energy sources due to high fuel prices has led to substantial government-supported development, such as the development of *Jatropha curcas*, that have created financial promises to farmers and attracted the interest of developing country farmers. But such monocultures should be carefully reviewed and subject to life cycle analyses, in particular in terms of their impact on soil, water and ecosystems resources.

A call for the establishment of a "moratorium". There was a debate among participants in the NGOs/CSOs consultation about the benefits of biofuels. Some participants quoted recent International Food Policy Research Institute (IFPRI), IFAD, Consultative Group on International Agricultural Research (CGIAR) and UN Framework Convention on Climate Change (UNFCC) studies casting doubt on the likely benefits of second generation biofuel technologies. One participant felt that biofuel cannot be excluded as an option to reduce the negative effects of GHG emissions.

In view of the concerns over increased production of biofuel, the majority of participants considered it urgent to establish a moratorium on extending the use of land for biofuel production in developing countries.[2] Putting land to this use threatens food security and will not, even with second generation technologies, address the needs of small producers, rural people and the poor.

One participant, however, opposed the moratorium and expressed the view that the demand for biofuels will lead to competition on the commodity markets with a consequent rise in world food prices in the medium and long term. In this view, higher world commodity prices should help the poor rural populations. At the same time, market policies need to be coherent, especially tariff protection, so that investments in agriculture by developing countries are geared toward the food security of their populations. Goals to reduce the greenhouse gas emissions of the transport sector have no solution in the short term other than to replace part of the fossil fuel consumption with renewable biofuels, according to that participant. Other participants pointed out the alternative of reducing transport demand, more fuel efficient engines, other technologies (fuel cells), etc., as well as shifting from private to public transport and road to rail.

---

[2] The United Nations Special Rapporteur on the Right to Food, Jean Ziegler, has called for a 5-year moratorium on biofuel production using current methods. This recommendation was included in his *interim* report on the right to food (A/62/289, 22 August 2007), submitted to the UN General Assembly. See also: ActionAid, *ActionAid Position on Biofuels and the Right to Food.*

Potential North-South conflicts of interest on biofuel use. One participant stressed that the EU demand for biodiesel based on colza feedstock cultivation in the region is good for pollinators and other biodiversity, and also contributes to the development of oil crops in Eastern European countries. Furthermore, at the EU level, governments are introducing mandatory targets for transport biofuel content (20 percent by 2020) and the European Commission directives for the promotion of renewable energy sources includes provisions for biofuel imports following sustainability criteria. Many participants, however, advocated that mandatory targets for biofuels could stimulate an unsustainable biofuel demand with serious consequences on small farmers in developing and developed countries and, thus, should be opposed.

Many participants also argued that biofuel trade benefits developed countries, in their search for new sources of transportation energy using feedstock from developing countries. This takes the classic form of export of raw materials from developing countries with low benefits to developing country smallholders. Likewise, monoculture plantations of large enterprises offer low, or even negative benefits to smallholders in developing countries, favouring large- scale, industrial forms of production instead. Adverse impacts include: land evictions for industrial exploitation, water diversion at the expense of small farmers and a market benefiting large foreign companies.

Another area of discussion with regards to differences between developed and developing countries concerned the Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD). First proposed within UNFCC discussions and introduced in 2005, REDD was believed to have a significant role in slowing the global warming process that would benefit all parties in developed, as well as developing countries.[3] However, it was argued that this concept is flawed because it tends to harm rural livelihoods. Although the idea seems alluring as it offers money to save the forest, it will eliminate rural people's access to the forest and eventually their source of income. This means that the number of forest-based agrarian conflicts could rise. Buyers are entities in developed country and sellers come from developing country. One side does not want to reduce its emission as it will harm the economy, and the other side is willing to exploit itself to earn income. At country level, the burden of climate change is put onto the shoulder of rural areas.[4]

Need for further analysis, monitoring, policy options and regulatory framework

Participants identified several areas that require further analysis and monitoring and made proposals regarding policy options and a possible regulatory framework.

Sustainability standards for biofuel policies. Climate change mitigation must be able to demonstrate clear and significant emission savings. The GHG intensity of biofuels should be measured over the entire lifecycle of the product, incorporating the effects of land-use change. FAO should examine the range of evidence of the economic, social and environmental impacts through a complete life cycle analysis. A multidimensional approach that takes many factors into account should be undertaken for the assessment of feedstocks for biofuels, including negative impacts of monocultures on biodiversity and the environment (e.g. pollution, deforestation, soil degradation), technology costs, social conflicts and secondary impacts (i.e. labour and land use).[5]

---

[3] Leo Peskett and Zoe Harkin. 2007. Risk and responsibility in Reduce Emissions from Deforestation and Degradation in Forestry Briefing 15. Can be downloaded from http://www.odifpep.org.uk/

[4] See contribution from AsiaDHRRA member from Indonesia for a critical overview of the REDD policy, see (2008) Tina Napitupulu, REDD: a Threat to our Sustainable Development.

[5] For a brief summary of bioenergy and its risks, and a preliminary identification of risk governance deficits, see the International Risk Governance Council concept note:(2007), *Governing the Risks and opportunities of bioenergy: Risks and opportunities of significantly increasing the production of biomass energy for heat, electricity and transport fuel*, Geneva. For an overview of the major concerns and opportunities of bioenergy and recommendations for policies, see the discussion paper by Gerald Knauf and Jürgen Maier (German NGO Forum Environment & Development), Nikki Skuce (OneSky, Canada), Annie Sugrue (CURES, Southern Africa): *The Challenge of Sustainable Bioenergy: Balancing climate protection, biodiversity and development policy*.

The widespread claims regarding sustainability and other potential benefits of second generation biofuels should be examined critically, and a comprehensive assessment of current biofuels should also be undertaken. Economic, environmental and social sustainability criteria should be a critical part of any analysis of bioenergy policy. In particular, biofuel standards used in policy development need to consider secondary impacts such as labour and land use. Due to the fact that land use and land-use change (e.g. deforestation) have been identified as an important driving factors of climate change, there is a need to have a better understanding of the role and the need of structural reforms, particularly land and agrarian reform, in mitigation and adaptation policies for climate change. Adaptation and mitigation policies should address the need of alternative farming practices based on sustainability criteria and in compliance with human rights.[6]

It was also underlined that international policies and recommendations on biofuels should not be made only on the basis of the promises of the second generation. There is an urgent need to develop an international framework to monitor the impacts of biofuel production on food availability, access to food and the stability of food supplies. FAO is presently the international institution with the largest institutional capacity for dealing with this matter and should therefore implement this monitoring, in cooperation with governments and civil society organizations.

Rather than searching for regulatory frameworks, other proposals included establishing accountability mechanisms by making use of existing international law that take into account the role of intergovernmental agencies and the accountability of the private sector.

Given the substantive impacts that the extension of the production of agrofuels might have on the right to food, including impact on the access to and control over land, water and other natural resources of rural communities as well as on food prices and food supply, it is extremely important that FAO raise the awareness of its member countries of the urgent need to adopt measures to protect rural communities from further land dispossession, and to protect poor urban consumers and poor net food importing countries from rising food prices. Any criteria developed for the assessment of the production of biofuels should be based on the principles of sustainable development and not be guided only by market opportunities or potential contributions to mitigation from pure environmental perspectives.[7]

Biomass and other alternative energy sources. Bioenergy must be evaluated within overall energy issues. Bioenergy alternatives, such as solar, wind and thermal energy, should also be assessed and evaluated against other energy sources for rural development that can contribute significantly to world food security and the challenges of climate change. Countries need to be aware of every available alternative without precluding existing sustainable energy alternatives. More generally, the international agenda should shift away from the promise of biofuels towards alternatives and more sustainable forms of energy. Therefore, FAO and its partners should not focus on biofuel but on the larger context of bioenergy, assessing the comparative value of other energy sources.[8] FAO should assist in the development of proposals for energy alternatives in rural areas, especially in regions with meagre or vulnerable energy options.

Gender-responsive climate strategies. Climate change and its impact on the agricultural sectors have a gender-differentiated impact. The world's poor, of which 70 percent are women who live primarily but by no means exclusively in developing countries, will be disproportionately affected by climate change. Therefore, all aspects of climate change activities (e.g. mitigation, adaptation, policy development, decision-making) must include a gender perspective. In addition, women's knowledge of their surroundings and of natural resources can prove essential when recovering from a natural disaster. This knowledge is usually underused. National and international adaptation plans, strategies

---

[6] For the discussion on both alternative farming practices and land use and access to resources, the "Voluntary Guidelines to Support the Progressive Realization of the Right to Adequate Food in the Context of National Food Security" provide a very important reference, particularly guidelines 2 and 8.

[7] "Practical Action", brief on biofuels for transport.

[8] For a multidimensional analysis and implications of biofuel adoption policies, see ActionAid, *ActionAid Position on Biofuels and the Right to Food.*

and budgets should recognize that women are powerful agents of change, that they can help or hinder in dealing with issues such as energy consumption, deforestation, burning of vegetation, population and economic growth, development of scientific research and technologies and policy-making, and that they should be included in all levels of strategies to adapt to climate change[9].

Promoting alternative food security paradigms. All issues regarding contributions to climate change and bioenergy should be examined through a multi-dimensional and gender-differentiated lens and should focus on sustainable agriculture, with a view to attaining food security. It is crucial for FAO, as a technical agency, to provide a holistic view of food security, climate change and the status of rural livelihoods and to consider governments' accountability under the Right to Food Guidelines. Technical approaches needs to be re-examined, particularly those that take no account of social issues or of the role of small farmers in biodiversity conservation and natural resource management, apart from what they can contribute to food security.

The role of FAO

Promoting a rights-based approach. Sustainable regulatory frameworks embracing rights-based approaches should be at the top of the international agenda. FAO should take a pro-active role in developing, together with countries and communities, pro-poor policies on food security and climate change, using the Right to Food and Food Sovereignty as the main guiding principles. FAO should promote and protect poor and vulnerable smallholders who have knowledge, experience and accumulated wisdom.

Climate change is driven by wealthy countries' unsustainable consumption patterns, for which poor countries now have to pay the price. FAO must facilitate an international policy framework that addresses climate change without harming the livelihoods of the rural poor and other marginalized groups, especially with regards to smallholder producers.

Protecting small farmers and promoting sustainable food models. FAO should provide a neutral platform for the exchange of ideas and alternative paradigms for agriculture and rural development. In particular, FAO has a fundamental role in documenting and promoting models of sustainable agricultural and farming practices, as well as policies that promote, rather than hinder, beneficial agro-ecological practices (including organic agriculture), in addition to underlining the importance of sustaining the ecosystem services provided by agricultural systems. One participant urged FAO to interact with national and regional governmental bodies such as the Association of Southeast Asian Nations (ASEAN), because these bodies are entering into major trade agreements that will seriously impact on vulnerable rural sectors and the environment. FAO can facilitate spaces for dialogue on policy reforms between and among governments, regional institutions, small farmers and producers.

Documenting, analyzing and disseminating relevant knowledge. The potential contribution of small-scale farmers and other producers' activities, as well as fisheries and extensive livestock production, to mitigating climate change has not been adequately analysed.

FAO needs to capture the wealth of knowledge and experience accumulated by civil society, social movements and NGOs working in the field. Local-scale solutions, such as the introduction of climate change-resistant crops, require international support. FAO could support efforts of CSOs in documenting initiatives for mitigating climate change. It can also facilitate sharing and access to scientific information needed by CSOs which are still grappling with biofuel issues and debates. The dissemination of FAO documentation would help small-scale producers cope with climate change footprint and implementation of relevant measures.

FAO should be in the forefront in documenting the impact of food production systems, transport and marketing on climate change, as well as the impacts of climate change on food production, including projections relevant to water, soils, forests, fisheries and plant genetic resources. With regards to land, there is need to document processes of land access and ownership concentration worldwide, their impact on producers and their projected consequences in terms of climate change. Relevant natural land resources include water, forests, fisheries and plant genetic resources. Also, there is need to shed

[9] See Ariana Araujo and Andrea Quesada Aguilar*, Gender Equality and Adaptation*, WEDO-IUCN policy brief.

light on the climate change-related impact of the present global food trade model in order to demonstrate the benefits of more localized food systems for climate change.

More comprehensive research is needed to identify sustainable management practices, technological options and environmental and social impacts of different levels of biofuel production. The rising biofuel demand poses a particular threat to the food security of vulnerable groups in poor net food-importing countries and marginalized communities. Therefore, there is a need to develop a framework to monitor the impacts of biofuels on food availability. This could include early warning systems or market interventions to prevent food shortages and put safety nets in place. FAO can help develop indicators and methodologies to help countries manage food security risks.

Need for sensitization and public awareness on production systems. At the national level, FAO needs to enhance its capacity to provide information to farmers and grassroots rural communities, policy-makers and legislators. FAO needs to identify entry points in order to communicate effectively with all stakeholders. It should, for example, engage with academic institutions charged with educating young people, as a means to affect the future directly.

FAO's decentralized offices (particularly its subregional offices) should play a dynamic role in information sharing and public awareness building. Public awareness should be raised on the consequences of consumption patterns, such as meat consumption as well as of alternative energy consumption patterns that have smaller global warming impacts, and the need for a lower carbon footprint of the food supply. Consumers should be made aware of the positive value of small-scale farming and local food systems.

Better coordination among UN and other international agencies. Many multilateral agencies, such as FAO and UN Environment Programme (UNEP), have taken climate change as a central theme. However, the agencies have undertaken different analytical exercises and, as a result, current assessments and projections from food and environmental agencies present contradictory scenarios. There should be greater interagency consultation on these issues, in order to share information and develop complementary positions such as linking food security with environment and trade, including the contribution of the current trade liberalization model to climate change. There also should be genuine international coordination, prioritization and closer collaboration and communication among the UN and other international agencies in order to make sure that the links among different issues emerge in a more consistent fashion. FAO needs to play a leading role in coordinating activities dealing with climate change and food production systems, relations and policies.

Exploring CSOs/NGOs participation

Establishing a neutral platform for policy dialogue. Stakeholders called for a process of transparent FAO engagement, including a platform for real dialogue with civil society, NGOs and social movements. This platform would enable mediation of the dialogue between civil society and national governments, set up regular exchanges and opportunities frank discussion of experiences, research results and views. Taking into account past experiences from the processes of the World Food Summit and the International Conference on Agrarian Reform and Rural Development (ICARRD), FAO has potential to play an effective neutral role by taking a stance in promoting biofuel production through sustainable practices inclusive of small-scale farmers and producers, small-scale fishers and pastoralists and, by effectively linking their efforts with governmental institutions, within a well facilitated political framework.

FAO can also encourage widening spaces for dialogue between governments and civil society. For example, FAO should build on what IFAD has done in highlighting the position of farmers through the IFAD "Global Farmers' Forum". FAO should join hands with IFAD in creating platforms at national, regional and international levels where CSOs in rural sectors can formulate a sectoral framework and strategies to address climate change. However, there will be no progress unless there is full engagement in adaptation activities by family enterprises and peasant farmers, pastoralists, artisanal fisherfolks and other food providers, using their skills and knowledge. Without this engagement, food sovereignty will not be achieved.

Financial mechanisms. Keeping in mind liability of historic GHG emitters, FAO and the international community should inform and build capacity of CSOs/NGOs to tap into financial mechanisms available for coping with the impacts of climate change.[10] For adaptation funding to be effective and efficient, as well as equitable, it is crucial that poor women are considered fully, and that their experiences and needs are reflected and prioritized in both policies and interventions for adaptation to climate change.[11]

One participant suggested that a prerequisite for funding mechanisms and adaptation and mitigation programmes should be open and transparent tripartite partnerships among governments, NGOs and social movements, particularly small producers. A suggestion was made for FAO, perhaps together with IFAD, to set up a Special Fund for Climate Change Mitigation in Agriculture that will reward the environmental services of the rural poor.

CSO/NGO participation leading to, at the High-Level Conference itself and post-Conference. FAO should allocate funding to facilitate consultation and dialogue with social movements, starting with the national and regional levels through FAO's decentralized structure. This is particularly critical to allow member-based organizations to respect their internal process of consultation and decision-making, as well as to solicit information to and from their members.

The voices of the highly marginalized and representatives of all social groups, including indigenous peoples, fisherfolk, women, pastoralists and others should be heard. Every effort should be made to keep them informed and engage them in the High-Level Conference process, ensuring the widest participation possible of these groups.

The participants noted that the High-Level Conference can build from its wealth of experiences of positive collaboration with civil society throughout the last decade, including the World Food Summit, the World Food Summit: *five years later* and ICAARD. These processes did not simply entail information sharing with producers and rural people. They called for FAO to play a dynamic role, building on new ways of thinking and pro-active engagement with civil society.

It would be advisable to link the CSO/NGO engagement and the High-Level Conference to other relevant processes, particularly at the FAO regional conferences, as well as other UN processes such as the Convention on Biodiversity (CBD), the Commission on Sustainable Development (CSD) and the UN Permanent Forum on Indigenous Issues (UNPFII).

[10] For a review and an evaluation of current available adaptation funding channels most appropriate for serving affected communities and of alternative models of adaptation finance based on identified principles of effectiveness, see ActionAid's discussion paper: Ilana Solomon*, Compensating for Climate Change: Principles and Lessons for Equitable Adaptation Funding*, ActionAid USA.

[11] For recommendations directed to country delegates negotiating adaptation financing and to the bodies responsible for the management of these funds to ensure that adaptation financing mechanisms effectively support poor women's adaptation needs see: Tom Mitchell, Thomas Tanner, Kattie Lussier, *We know what we need: South Asian women speak out on climate change adaptation* (2007).