

NETWORKING AND TECHNOLOGY TRANSFER ON CLIMATE CHANGE: THE INTERNATIONAL CLIMATE CHANGE INFORMATION PROGRAMME

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Abstract- The last ten years have seen a particularly intense increase in the degree of emphasis to climate issues as a whole and in the level of attention paid to climate change in particular. Finding practical, workable and cost-efficient solutions to the problems posed by Climate Change is now a world priority and one which links government and non-government organisations as well as the general public in a way not seen before. But even though climate change is a matter of great scientific relevance and of broad general interest, there are many problems related to its communication.

The understanding about the causes, consequences and means to tackle climate change is one of the most important challenges of modern times. Without a holistic understanding of the problem and its various ramifications, there can be no effective handling of the problem, nor can long-term solutions be sought. This paper outlines the need for better information, networking and technology transfer on climate change. It describes the International Climate Change Information Programme (IICIP), as well as its activities and projects, which ultimately aim to support the on-going efforts towards the search for solutions for the problems associated with climate change, an issue which is global in nature, but which needs to be supported by concrete regional and local efforts.

Keywords- climate change adaptation- management- technology transfer- education- awareness-raising

Introduction

There are now significant efforts towards addressing the various problems related to climate change, and in particular, in respect of the Copenhagen 2009 agreement of keeping global average temperature increases below 2 degrees Celsius - compared to pre-industrial levels. In the case of Europe, this commitment is complemented by a further one, to reduce CO₂ and greenhouse emissions to 20% by the year 2020. A further challenge pursued by the international community, is to make sure that due emphasis is given to policies in the field of climate change, so as to allow a basis upon which mitigation and adaptation measures may be undertaken and hence yield the expected benefits. This is particularly important in the developing world, whose ability to

adapt is rather limited, and where adaptation measures may make a difference between access to prosperity and more suffering.

The increased level of emphasis and attention given to climate change, should not distract one from the fact that it still means different things to different people. A coastal community in Bangladesh who is vulnerable to sea level rise, perceives climate change differently from a farmer in Kenya, whose crop production is adversely affected by increased droughts and reduced rains. To the same measure, mitigation measures undertaken by governments in rich countries which may focus on the development of renewable energy, will differ from mitigation approaches used in small island States, who produce little CO₂ emissions, but which are concerned with the impacts climate change may have on their livelihoods.

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Also, due to its many ramifications, a comprehensive understanding of what climate means, is not easy to achieve. Dispensa and Brulle (2003) demonstrated this on an analysis of the media's social construction of environmental issues with a focus on global warming, whereas McCright and Dunlap (2000) assessed the emphasis given to global warming as a social problem, complemented by Pettenger (2007) who explored the social construction of climate change and Oreskes who looked at its scientific consensus.

Ogunseitani (2003) produced a framework towards the understanding of environmental change in Africa, with the relevant links against vulnerability. The extent to which the discourse on climate change is alarmist or alarming has been explored by Risbey (2008), whereas Smith (2007) assessed disruptions in the global discourse.

It is a matter of fact, that people tend to understand climate change more easily, if it is contextualised, i.e. if information on general climate change principles and processes, may be applied, in practice, to specific situations and context. Table 1 outlines some of items to be considered when fostering an understanding about climate change.

Table 1- Some of the means to foster understanding about climate change

Problem area	Means to foster understanding	Impact
International regulatory frameworks	Links with national climate policies	Medium
Complexity of new technologies	Demonstration of each technology	High
Outlooks in global warming	Use of computer models	Medium
Projections in sea level rise	Scenario building	High
Frequency of extreme events	Presentation of their roots and impacts	Medium

The line of thinking followed in Table 1, means that by means of tools such as demonstrations and scenario building, elements associated with climate change become more easily visualised, interpreted, and hence, are better understood. This is especially relevant in adaptation efforts, which need to heavily rely on people's willingness to engage on a change in behaviours. This has been demonstrated by Leal

Filho (2009), who outlined the interdisciplinary aspects of climate change, drawing attention to the fact that individual disciplines can provide an important contribution to its overall understanding.

On a sectorial level, much can be achieved by fostering an understanding about climate change, by means of approaches and methods commensurate with a target group's profile. Eagan and Schott (2008) made an useful analysis of the need to foster awareness on climate change in a higher education context. A study by Leviston and Walker (2011), who undertook a baseline survey of Australian attitudes to climate change with a sample in excess of 5.000 participants, identified the fact that the majority believe climate change is taking place but only half think it is human-induced. The survey also investigated which sources of information are most believable, and highlighted the linkage between voting intention, climate change belief and climate-related behaviours.

Eriksen et al (2011) undertook an analysis of the extent to which climate change responses may be positive or negative and came to the conclusion, that not all responses are positive ones. Furthermore, the authors explore a set of principles which may lead to sustainable adaptation.

Schenk (2009) undertook a comparison of climate change induced resettlement of Tibetan nomads in Qinghai, China and New Orleans after Hurricane Katrina. It identified the fact that different planning approaches may adversely influence people's willingness to engage in resettlements. Current and future planning needs to take into account people's views and concerns, if they are to succeed.

A demonstration of the importance of cultural values has been demonstrated by Kuruppu (2009), who investigated the means to adapt water use in Kiribati. The article highlights the importance of integration the cultural values and meanings into adaptation programmes and planning. This is followed by a paper by Bardsley, and Hugo (2010), who examined the connections between migration and climate change, identifying thresholds of change to guide effective adaptation decision-making.

Batterbury (2010) presented some approaches towards preparedness for climate change adaptation in local and state planning, using examples from Victoria in Australia. This is based on a workshop on how to integrate adaptation into strategic planning in state and local governments in Victoria. A further report has been produced by Gardner,

Parsons and Paxton, who outline the current level of adaptation planning among Australian organisations, and identify drivers and barriers in adaptation activities. One of the aims has been to set up a benchmark in order to examine changes in adaptation decision-making/activities in Australia.

Ungar (1998, 2007) performed a comparison of the marketability of the ozone hole and global warming as topics (1998) and public scares associated with it.

The work performed by these authors suggest that if we are going to succeed in implementing adaptation measures, we need to ensure all characteristics of the group one will work with, is fully considered. This sounds quite obvious in principle, but this principle is not always followed in practice, leading to a limited degree of success of some adaptation projects.

The role of technology transfer in tackling the challenges of climate change

Climate change adaptation is a complex process, and one which cannot be pursued by single actors on their own. Bearing in mind that climate change impacts do not take into account political or administrative borders, integrated action is required vertically on the one hand, across multiple levels, and horizontally on the other hand, across sectors. In addition, climate change adaptation needs to be supported by appropriate systems, which may assist with its implementation. One of these tools is technology transfer.

Technology transfer in the field of climate change can be defined as:

the use of methodologies which may facilitate knowledge access to climate knowledge and foster climate-related innovation, including collaborative institutional arrangements for their implementation and dissemination which pay due to emphasis to local conditions and contexts.

In discussing the role of technology transfer in helping to address climate change, it is important reiterate the need for a full understanding of the complexity of this matter. As seen in Figure 1, there are many variables that influence climate change. A broader understanding of these variable is essential if any activity in this field is expected to yield any results. Due to their complexity, they will be discussed in turn.

Socio-economic elements of climate change refer to the social impacts, and the expected costs, of

tackling the problem associated with –or deriving from- climate change.

Political elements are related to the whole set of regulatory frameworks and legislation, which set the basis for a country's efforts and performance in respect of climate change and the willingness to implement them by means of appropriate implementation of the legal framework.

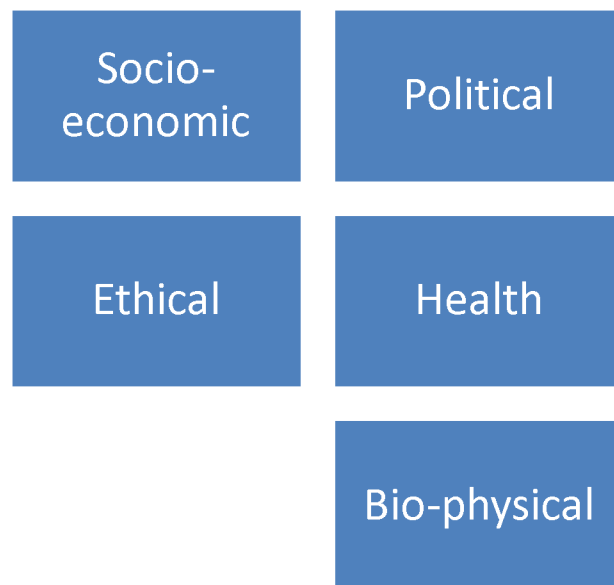


Figure 1- Some of the variables that influence climate change

Ethical elements are closely linked with the effects of climate change on personal and communities, especially those practices which lead to social degradation, inequalities and social injustices.

Ecological elements consider the impacts of climate change on fauna, flora and biodiversity, bearing in mind the dramatic effects it can have on animals and plants, whose capacity to adapt to sudden change in climate conditions is very limited.

Health elements are associated with the damages that may be caused by increases (or decreases) in temperature. In particular, health problems may be caused to more vulnerable people (e.g. infants, the elderly) and generate conditions which may encourage certain diseases to become more widely spread.

Technological elements refer to the advancements in technology which may allow not only short term

adaptation measures to be implemented, but also long-term mitigation ones.

Bio-physical elements refer to the due consideration to natural processes and phenomena, which are the roots of the problem.

The fact that climate change goes well beyond an understanding of geo-physical processes, and that it has deep socio-economic issues suggests that technology transfer initiatives in this area require a far greater and more interdisciplinary approach, than in other fields, where access to technology may be more important than implementation. Successful technology transfer in the field of climate change is subjected to a number of pre-conditions. These are outlined in Table 2.

Table 2- Pre-conditions for successful technology transfer in climate change

Element	Importance
Policy support	Institutional framework for implementation
Local know-how	Capacity for local technology implementation
Availability of facilities	Means to deliver the technology
Commitment	Willingness to implement the technology
Focus	Emphasis on a concrete problem or issue
Protection of Intellectual Property	Secure IP rights

It can be seen that technology transfer can be a valuable ally in supporting efforts in respect of climate change adaptation.

The existence of the above pre-conditions will determine whether climate-related technology transfer will succeed or not

The Cancun Adaptation Framework agreed at COP 17 in Cancun, Mexico in December 2010, emphasized the need to “enhance action on adaptation, including through international cooperation and coherent consideration of matters relating to adaptation under the Convention”. The Framework departs from the assumption that enhanced action on adaptation seeks to reduce vulnerability and build resilience in developing country Parties, taking into account the urgent and immediate needs of those developing countries that are particularly vulnerable. The Cancun Adaptation

Framework includes the following five clusters (UNFCCC, 2011, Cancun Framework):

1. Implementation

- All Parties to plan, prioritize and implement adaptation actions and to use existing channels to provide information on support provided and received for adaptation actions and on activities undertaken;
- A process to enable LDC Parties - building upon their experience with the NAPAs - to formulate and implement national adaptation plans and an invitation to other developing country Parties to employ the modalities formulated to support those plans;
- A 2-year work programme to consider approaches to address loss and damage associated with climate change impacts in developing countries that are particularly vulnerable to the adverse effects of climate change.

2. Support

- Developed country Parties to provide developing country Parties, taking into account the needs of those that are particularly vulnerable, with long-term, scaled-up, predictable, new and additional finance, technology, and capacity-building (paras 95-137) to implement adaptation actions, plans, programmes and projects at local, national, subregional and regional levels, including activities under the Cancun Adaptation Framework.

3. Institutions

- At the global level: establishment of an Adaptation Committee to promote the implementation of enhanced action on adaptation in a coherent manner under the Convention;
- At the regional level: strengthening and, where necessary, establishing regional centres and networks, in particular in developing countries;
- At the national level: strengthening and, where necessary, establishing and/or designation of national-level institutional arrangements.

4. Principles

- Be undertaken in accordance with the Convention;
- Follow a country-driven, gender-sensitive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems;
- Be based on and guided by the best available science and, as appropriate, traditional and indigenous knowledge;
- Be undertaken with a view to integrating adaptation into relevant social, economic and environmental policies and actions.

5. Stakeholder engagement

- Relevant multilateral, international, regional and national organizations, the public and private sectors, civil society and other relevant stakeholders are invited to undertake and support enhanced action on adaptation at all levels.

(UNFCCC, 2011, Cancun Framework)

Many Parties to the UN Framework Conference on Climate Change (UNFCCC) believe that additional measures should be taken, to ensure that areas, such as IP support, are better handled and that the rights associated with IP are not lost on the debate. Since information, education and communication are also important means via which climate change adaptation may be pursued, the next section of this paper will describe ICCIP, a programme designed to tackle these aspects.

Introducing ICCIP

The last ten years have seen a particularly intense increase in the degree of emphasis to climate issues as a whole and in the level of attention paid to climate change in particular.

Finding practical, workable and cost-efficient solutions to the problems posed by Climate Change is now a world priority and one which links government and non-government organisations as well as the general public in a way not seen before. But even though climate change is a matter of great scientific relevance and of broad general interest, there are many problems related to its communication. Climate change is often regarded as too broad in scope, as too abstract in respect of its implementation, too complex and therefore too difficult to understand. Yet, much could be gained by ensuring matters related to climate change are better understood and if people are motivated to

engage in the global efforts to address the challenges posed by climate change.

There is thus a perceived need for concrete action in order to address the problems inherent to the communication of climate change and to undertake a set of information, communication, education and awareness-raising initiatives which may allow it to be better understood. It is on the basis of this reality that the “**International Climate Change Information Programme**” (ICCIP) has been created.

The creation of the “**International Climate Change Information Programme**” is a concrete step towards the goal of “climate change understanding for all”, supporting the on-going efforts towards the search for solutions for the problems associated with climate change, an issue which is global in nature, but which needs to be supported by concrete regional and local efforts.

The aims of the “**International Climate Change Information Programme**” are:

- to disseminate the latest findings from scientific research on climate change, including elements related to its environmental, social, economic and policy aspects in a way that allow them to be understood by the non-specialist audience. This will take place by means of books, book chapters, journal articles and information via the media;
- to undertake education, communication and awareness-raising projects on matters related to climate change in both industrialised and developing countries in cooperation with UN agencies, universities, scientific institutions, government bodies, NGOs and other stakeholders;
- to network people and organisations ways to discuss the problems, barriers, challenges and chances and potentials related to communication on climate change.

Based on the fact that current internet technologies can provide a substantial contribution in terms of disseminating information and the latest scientific findings on climate change research in a fast and efficient way, the “**International Climate Change Information Programme**” strives to help to meet the demand for climate-friendly and climate-neutral events. On-line events such as “Climate 2008”,

“Climate 2009”, “Climate 2010” and “Climate 2011” (see Figure 3).



Figure 3- Home Page of Climate 2011

Further events organized by the programme are the “European Climate Teach-In Day” (June 2009), the “World Climate Teach-In Day” (June 2010) and “African Climate Teach-In Day” (June 2011) as seen in Figure 4, are organized on a regular basis, not as means to replace conventional, presence events, but as a complement to them.



Figure 4- Home Page of the “African Climate Teach-In Day”

Last but not least, the “**International Climate Change Information Programme**” will encourage more networking and information exchange and catalyse new cooperation initiatives and possibly new projects. In terms of its target groups, ICCIP aims to reach a broad audience which consists of:

- Scientists,
- Decision-makers,
- Enterprises,
- NGOs,
- Universities,
- Schools,
- Local communities and
- Interested individuals

All these groups benefit from the activities undertaken as part of the ICCIP.

As far as activities are concerned, the “**International Climate Change Information Programme**” performs the following ones:

- Organization of information events on different aspects of climate change, including environmental, social, economic and policy aspects;
- Production of books, book chapters, journal articles and information which may

be disseminated via the media. The newly-created “International Journal of Climate Change Strategies and Management” (Figure X) and the new series “Climate Change Management” with Springer, one of the world’s top scientific publishers, is an example of the type of work planned;

- Execution of education, communication and awareness-raising projects on matters related to climate change in both industrialised and developing countries;
- Organisation of joint activities in cooperation with UN agencies, universities, scientific institutions, government bodies, NGOs and other stakeholders.

In terms of its partnership the “**International Climate Change Information Programme**” is an initiative led by the Hamburg University of Applied Sciences in Germany, working in cooperation with a wide number of organisations. These are:

- United Nations Environment Programme (UNEP)
- World Meteorological Organisation (WMO)
- Intergovernmental Panel on Climate Change (IPCC)
- United Nations Educational, Scientific and Cultural Organization (UNESCO)
- European Space Agency (ESA)
- Global Environment Facility (GEF)
- German Agency for International Cooperation (GIZ)
- Food and Agriculture Organisations of the United Nations (FAO)
- Caribbean Community Climate Change Centre (CCCCC)
- Sahara and Sahel Observatory
- Information Board of Climate Change Communication (IOCCC)

The following universities are founding members of ICCIP:

Europe

HAW Hamburg (Coordination)
Denmark Technical University (Denmark)
Technical University of Istanbul (Turkey)
Royal Institute of Technology (Sweden)
Cambridge University (UK)
Centre International de Recherche sur

l'Environnement et le Développement (France)
Polytechnic of Turino (Italy)
University of Latvia (Latvia)
Baltic University Programme (a network of 200 universities in Germany, Denmark, Estonia, Finland, Lithuania, Latvia, Poland, Russia and Sweden)

North America

Columbia University (USA)
Yale University (USA)
Cornell University (USA)
University of Ontario (Canada)
University of Regina (Canada)

Australasia

University of Melbourne (Australia)
BRAC University (Bangladesh)
TERI University (India)

Africa

Alexandria University (Egypt)
University of Nairobi (Kenya)
University of Cape Town (South Africa)
Cheikh Anta Diop University (Senegal)

Latin America

Bolivia Catholic University (Bolivia)
University of Sao Paulo (Brazil)
University of Chile (Chile)

The “**International Climate Change Information Programme**” will also network people and organisations ways to discuss the problems, barriers, challenges and chances and potentials related to communication on climate change.

Ultimately, the “**International Climate Change Information Programme**” will break the barriers seen when one tries to communicate climate change and suggest measures to address the existing deficiencies.

The project CELA

Latin American (LA) countries are highly vulnerable to climate change impacts. Despite the fact that adapting to climate change has high priority among many LA governments, a current lack of technology and access to resources hinder these countries to adapt successfully. Therefore, there is a need for international assistance to enable Latin America to cope with the many challenges climate change poses to them.

It is on the basis of the above needs, the project CELA – Network of Climate Change Technology Transfer Centres in Europe and Latin America is being undertaken, as part of the ALFA III Programme, an European Union funded scheme to foster co-operation between Higher Education Institutions of the European Union and Latin America.

The purpose of the project CELA is not only to improve the academic quality of European and Latin American higher education institutions (HEI), but also to strengthen the role of HEI to contribute to sustainable development and social cohesion. The home page of CELA can be seen in Figure 5.



Figure 5- Home Page of the project CELA

CELA will foster EU-LA applied research and technology transfer in the climate change sector, and will lead to the set-up of an infra-structure called “Climate Change Technology Transfer Centres”, which will be making better use of the science and technology knowledge existing in the participating regions and in setting-up networks to intensify joint EU-LA applied research in the field, in support of socio-economic development. Since lack of expertise and access to knowledge are major impediments to tackle the challenges of climate change, the project entails the development of highly-qualified training for research staff, which will play a very important role in training people

and providing expert advice (research and technology transfer) and thereby have a positive, long-term impact on the socioeconomic development in the participant LA countries and beyond.

The specific objectives of the CELA project are:

- To increase the capacity and to improve the quality of research within the scientific and technology community in LA and EU;
- To develop and establish a market-oriented research framework to better capitalise and disseminate research on climate change;
- To strengthen the link of EU and LA research communities with the regional market, business and legislation (policy) in the field of climate change;
- To develop and establish a market-oriented EU- LA network of Climate Change Technology Transfer Centres

The project will ultimately greatly assist efforts in LA to provide a market-oriented research and technology transfer approach, complemented by establishing specific recommendations for the different countries of how to excel within their region and beyond. In doing so, the project will address a set of issues seen in the Millennium Development Goals such as fighting poverty and pursuing environmental sustainability.

Conclusions

The search for technological solutions is important in meeting the challenges of climate change. Two important elements of this formula, are the enhancement of existing abilities and the lowering the bureaucratic hurdles and costs of access to technologies in receiving countries.

An in-depth study of the various variables that influence technology transfer on climate change, may facilitate the dissemination of appropriate climate change technologies and hence provide a basis for more productive and practice-based implementation. Here a special emphasis needs to be given to technologies that are not only affordable, but also truly adequate to developing countries, which need to have the capacity to absorb them. There should be also a proper emphasis to the expertise needed, so that the potential of climate-related technologies may be realized in full.

ICCIP can provide important impulses and the badly needed support in order to assist with technology transfer in this important field. Projects like CELA, which foster technology transfer on matters related to climate change between Europe and Latin America, is an example of what can be achieved and illustrates one of the ways via which the theory of technology transfer on climate change, may be implemented into practice.

References

- Bardsley, D.K. & G.J. Hugo (2010). Migration and climate change: examining thresholds of change to guide effective adaptation decision-making. *Population and Environment*, Volume 32: 2-3, 238-262. Available at <http://www.springerlink.com/content/1gpv8076t4107688/>
- Batterbury, S.P. J. (2010). Adaptive learning – a think-tank on preparedness for climate change adaptation in local and state planning in Victoria. Melbourne: VCCCAR. ISBN 978 0 7340 4193 7. Available at: <http://www.vcccar.org.au/files/vcccar/Adaptive%20learning%20think%20tank%20report.pdf>.
- Dispensa, J.M., Brulle, R.J. (2003) Media's social construction of environmental issues: focus on global warming—a comparative study. *International Journal of Sociology and Social Policy* 23, 74–105.
- Eagan, D. Keniry, J., and Schott, J. (2008), Higher Education in a Warming World: The Business Case for Climate Leadership on Campus, National Wildlife Federation, Reston, VA.
- Gardner, J., Parsons, R. and Paxton, G. (2010). Adaptation benchmarking survey: initial report. CSIRO Climate Adaptation Flagship Working paper No. 4. Available at <http://www.csiro.au/files/files/px5a.pdf>
- Kuruppu, N. (2009) Adapting water resources to climate change in Kiribati: the importance of cultural values and meanings. *Environmental Science & Policy*, 12, 799-809.
- Leal Filho, W. (2009) *Interdisciplinary Aspects of Climate Change*. Peter Lang Scientific Publishers, Frankfurt.
- Leviston, Z. and I. Walker (2011) Baseline Survey of Australian attitudes to climate change: Preliminary Report, Social and Behavioural Sciences Research Group, CSIRO National Research Flagships Climate Adaptation, available at <http://www.csiro.au/files/files/p102a.pdf>
- McCright, A.M., Dunlap, R.E. (2000) Challenging global warming as a social problem: an analysis of the conservative movement's counter-claims. *Social Problems* 47, 499–522.
- Ogunseitan, O.A. (2003) Framing environmental change in Africa: cross-scale institutional constraints on progressing from rhetoric to action against vulnerability. *Global Environmental Change* 13, 101–111.
- Oreskes, N. (2004) The scientific consensus on climate change. *Nature* 306, 1686.
- Pettenger, M.E., 2007. *The social construction of climate change*, Ashgate, Burlington, VT.
- Risbey, J.B. (2008) The new climate discourse: alarmist or alarming? *Global Environmental Change* 18, 26–37.
- Schenk, T. E. (2009) Finding the higher ground: assessing contrasting approaches to planning for climate change induced resettlement, Massachusetts Institute of Technology, Department of Urban Studies and Planning Master's Thesis available at <http://hdl.handle.net/1721.1/50123>
- Smith, H.A. (2007) Disrupting the global discourse of climate change: the case of indigenous voices. In: *The Social Construction of Climate Change*, Ashgate, Burlington, VT, pp. 197–215.
- Ungar, S. (1998) Bringing the issue back in: comparing the marketability of the ozone hole and global warming. *Social Problems* 45, 510–527.
- Ungar, S., (2007) Public scares: changing the issue culture. In: *Creating a Climate for Change: Communicating Climate Change & Facilitating Social Change*, Cambridge University Press, New York, pp. 81–88.
- United Nations Framework Convention on Climate Change (UNFCCC) (2011) The Cancun Framework. Report of the Conference of the Parties on its Sixteenth Session, held in Cancun from 29 November to 10 December 2010. UNFCCC, Geneva.

