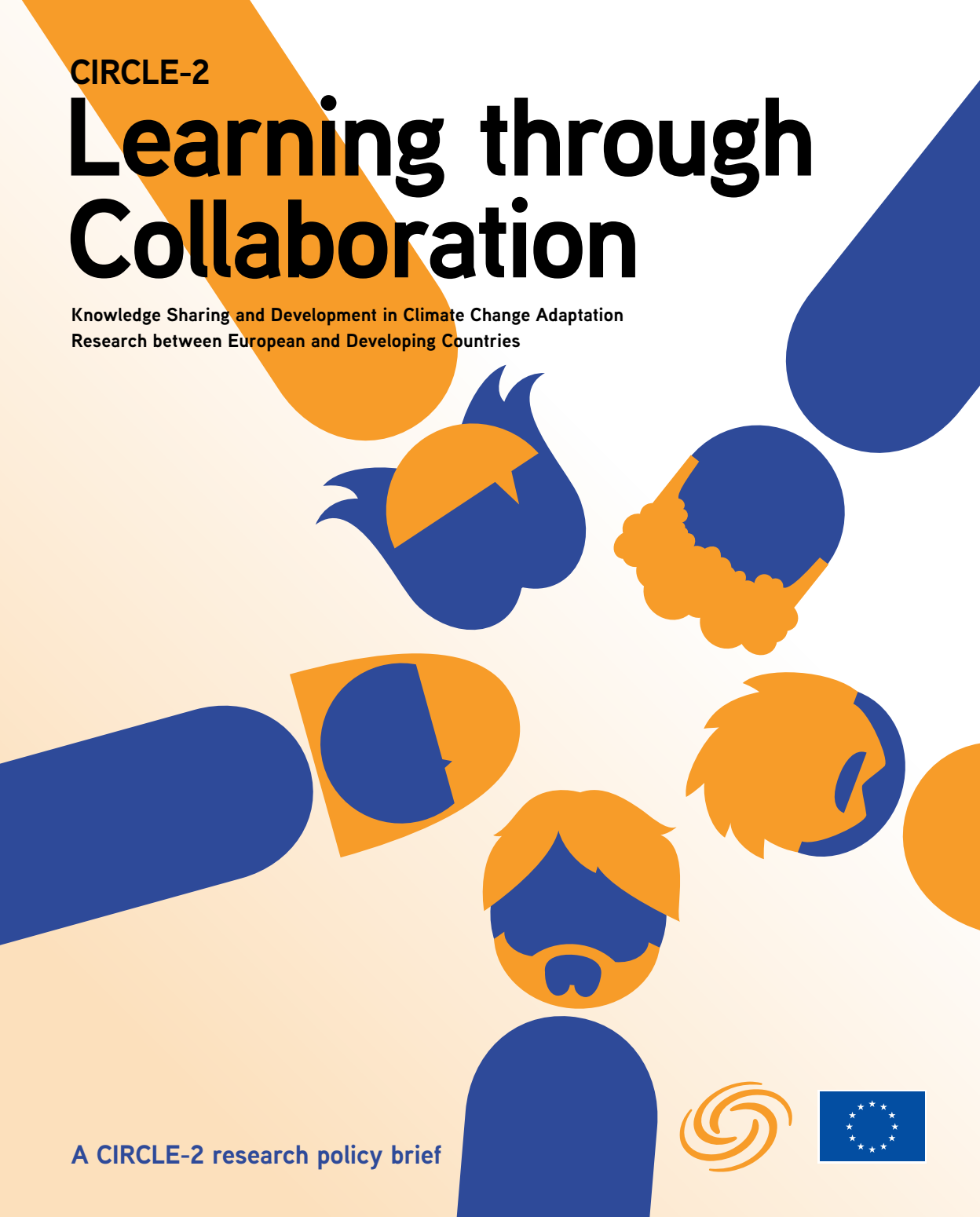
CIRCLE-2

Learning through Collaboration

Knowledge Sharing and Development in Climate Change Adaptation Research between European and Developing Countries



A CIRCLE-2 research policy brief

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The ERA-Net CIRCLE-2

Box 1

From 2004-2009, and from 2009-2014, partners of CIRCLE (Climate Impact Research & Response Coordination for a Larger Europe) and CIRCLE-2, respectively, have collaborated to fund research and share knowledge on climate change impacts, vulnerability and adaptation and the promotion of long-term cooperation among national and regional climate change programmes in Europe. The partners have funded or are funding projects or programmes of varying size at the national level (see CIRCLE-2 Infobase http://www.circle-era.eu/np4/10) and have, through competitive joint calls, supported a number of transnational projects for the Nordic, Mountainous and Mediterranean areas, the latter including partners from Northern Africa (see http://www.circle-era.eu/np4/Joint_Initiatives).

The objective is to develop and strengthen the coordination of national and regional research programmes and help reduce fragmentation across the European Research Area (ERA). Under the ERA-NET scheme, programme 'owners' (typically ministries or regional authorities) and 'managers' (typically research councils or other research agencies) can identify research programmes they wish to coordinate or open up and develop joint activities including the support of joint calls for transnational projects. Having evolved from a focus on climate impacts to climate adaptation, CIRCLE-2 comprises 34 institutions from 23 countries (http://www.circle-era.eu/np4/home.html) that work together to:

- support a common research agenda and joint programming foresight activities helping to structure a common language and framework for policy relevant adaptation research;
- fund adaptation research though transnational joint calls and other joint activities contributing to a durable cooperation between European climate research programmes and their funders;
- make available existing knowledge on adaptation and foster the production of research along identified needs contributing to the development of a European knowledge base on climate change. ■

Key messages

✓ *Knowledge sharing and development*, rather than knowledge transfer, plays as yet a marginal role in European climate change adaptation research programmes. Experiences from CIRCLE 2 indicate a rationale and opportunities for European countries to give knowledge sharing and development a much more central position in adaptation research and policy.

✓ *Benefits of enhanced knowledge sharing and development* include enhancement of the knowledge basis available to bi- or multilateral adaptation programmes, increased effectiveness of adaptation research for both developing and European countries, and a narrowing gap between development collaboration agencies and the adaptation research community.

Benchmarks for knowledge sharing and development

✓ *Be aware of barriers.* Barriers that can limit the effectiveness of knowledge sharing and development include lack of trust, lack of relevant knowledge, uncertainty about project objectives and process, technological infrastructure differences, physical distance, cultural diversity, language barriers, incompetence, lack of skills or motivation.

✓ *Adopt demand-driven objectives and design.* Programmes and projects on adaptation knowledge sharing and development should be designed based on the needs of developing countries, and be tailored to the specific local context.

✓ *Build lasting partnerships and engage stakeholders adequately.* A sufficiently wide range of stakeholders from various institutional background and administrative levels should be actively involved. Dependent on the specific situation, this should include "local champions", the private sector, particularly vulnerable groups, and local political decision-makers, groups which are often not actively engaged. Engagement should cover the whole project duration, and stakeholders should have equitable influence on project design and implementation features.

✓ *Take normative adaptation dimensions seriously.* Effective adaptation knowledge sharing and development requires the normative dimensions of adaptation knowledge to be identified, disclosed and discussed. How to do this depends on the institutional setting of the personal interactions, taking into account the project conditions that will differ between projects, depending on what type of knowledge is transferred, shared, or developed and between whom.

✓ *Ensure the availability of adequate resources.* Projects should have secure funding for at least 2-3 years, including start-up time to engage stakeholders, agree on objectives and procedures, and build trust. Budgets should be sufficient to frequently organize face-to-face dialogue and learning events and allow all partners to adequately become and remain engaged.

✓ *Adopt a suitable mix of knowledge sharing methods.* There is no one-size-fits-all solution and different methods and tools are likely to provide different, complementary answers. A variety of knowledge exchange methods can be explored, such as scenario development and planning, gaming and role playing, and electronic means of information exchange. The latter have greatly enhanced the potential volume of information to be shared and the frequency, reach and scope of communication, but at the same time they have a number of important limitations, including technical problems and limited ability to cover interpersonal aspects of communication. ■

Why this policy brief and for whom?

Objectives and target audience
The CIRCLE-2 partners (see Box 1 for more information about CIRCLE-2) consider transfer of the knowledge generated by adaptation research investments in Europe to be potentially useful for developing countries, which are more vulnerable to climate change and its impacts than most European countries. With a few notable exceptions, knowledge sharing and development focusing on climate change adaptation is currently not yet high on the agenda of European national research funders and researchers, like those represented in CIRCLE-2 and the Joint Programming Initiative Climate.

Because of the importance of the two-way and dynamic nature of knowledge exchange, the term "knowledge sharing and development" is used rather than "knowledge transfer". It is a major challenge to determine which knowledge can be meaningfully shared, or jointly developed, and under which conditions. The objective of this research policy brief is to address this challenge and propose a set of benchmarks or good practice principles for CIRCLE-2 partner programmes and other research funding and managing institutions. Possible project and programme design options are proposed that facilitate and promote knowledge sharing between industrialized and developing countries in the area of climate change adaptation research. Knowledge sharing would enhance the knowledge basis available to adaptation programmes which are funded either bilaterally or in the context of one of the international adaptation funding mechanisms (see also Box page 5). It can help narrowing the gap between the development collaboration agencies, private sector actors and other institutions engaged in adaptation practice, and the climate adaptation research communities.

This research policy brief builds on a background paper on sharing and developing knowledge most effectively. It also discusses earlier collaborative projects between industrialized and developing countries in the area of climate change adaptation that can be regarded as successful in sharing and developing knowledge. The communities working on climate change adaptation research (both in Europe and in developing countries) often appear not to be well connected with the communities working on social and economic development. This policy brief intends to make a contribution to bridging this gap. Target groups include research funding and management agencies (including the CIRCLE-2 partners), development agencies addressing risks related to climate change variability and change, and researchers and research coordinators engaging in collaborative projects between industrialized and developing countries.

Scope of the projects and programmes addressed
For this document, relevant lessons to be learned were derived mainly from specific climate change adaptation projects, including projects in areas like water management, agriculture and rural development, and public health. The emphasis is on two-way mutual learning and collaboration rather than a one-way, mechanistic transfer of particular knowledge from industrialized to developing countries. Literature and the CIRCLE-2 survey agree that the specific design of knowledge sharing and development programmes and projects has to be tailored to the specific local context, and collaboration with one region, e.g. South Asia, may have specific characteristics different from collaboration with another region, e.g. Africa. Nevertheless, in this policy brief, it is assumed that generic lessons can ▸

The international policy context of climate change adaptation

Box 2

Much international work related to collaboration in the area of adaptation is organized in the context of or stimulated by the 2006 Nairobi work programme (NWP) of the United Nations Framework Convention on Climate Change (UNFCCC), with the objective to "assist all Parties, in particular developing countries, including the least developed countries and small island developing States to improve their understanding and assessment of impacts, vulnerability and adaptation to climate change; and to make informed decisions on practical adaptation actions and measures to respond to climate change on a sound scientific, technical and socio-economic basis, taking into account current and future climate change and variability". CIRCLE-2 is NWP partner. The 2010 Cancun Adaptation Framework adopted at UNFCCC COP 16 in 2010 represents an additional framework for action on adaptation. A Technology Mechanism was established in Cancun to facilitate the implementation of enhanced action on technology development and transfer in order to support action on mitigation and adaptation to climate change. The UNFCCC supports and assists Least Developed Countries through the Least Developed Countries Fund (LDCF), which was established to carry out the preparation as well as the implementation phases of National Adaptation Programmes of Action (NAPAs) for these countries. The Special Climate Change Fund (SCCF) was established to support adaptation and technology transfer in all developing country parties to the UNFCCC. In addition, the Kyoto Protocol's Adaptation Fund can play an important role but will be insufficient to support adaptation in all developing countries. Multilateral organizations like World Bank, UNEP, UNDP and many others support the developing countries in developing and implementing climate change adaptation knowledge. The Belmont Forum of research funders includes climate adaptation in the broader context of environmental change research, recently structured by the scientific community in the Future Earth programme.

The EU Adaptation Strategy does not address support to or collaboration with developing countries, but refers to the EU action plan on climate change and development. The action plan ensures that climate change is incorporated into all aspects of EU development policy. The EU specifically links climate change adaptation to disaster risk reduction in developing countries, in particular because disasters undermine development and jeopardise the achievement of the Millennium Development Goals (MDGs). Collaboration in the field of climate change adaptation research between Europe and developing countries can help to ensure environmental sustainability (MDG goal 7) and strengthens global partnership for development (MDG goal 8). Think tanks on future developments such as the German Advisory Council on Global Change (WBGU) have pointed out that sustainability can only be achieved with the active inclusion of developing countries in the field of climate protection and adaptation. The new EU Horizon2020 research programme, like its predecessor FP7, is expected to include collaborative adaptation research. Even though the Joint Programming Initiative Climate did not yet explicitly include knowledge sharing and development in its agenda, experiences and results from CIRCLE 2 suggest its consideration. EU member states such as Germany, Sweden, The Netherlands, the United Kingdom (e.g., through the UK Climate and Development Knowledge Network) and others are already integrating climate change adaptation into their developing collaboration programmes, sometimes specifically targeting adaptation, sometimes by "climate-proofing" broader development programmes. ■

be learned from interactions between regions. But in a way, many of the issues dealt with in this policy brief are relevant for any collaborative project between industrialized and developing countries, because adaptation and general development processes are closely interlinked.

Effectiveness, or success, of knowledge sharing is a difficult issue to measure and examine. Following the literature and the CIRCLE-2 survey results, it is assumed that good collaboration facilitates good sharing of knowledge between project partners in adaptation-oriented research projects. The policy brief attempts to strike a balance between generic, theoretical considerations from a heterogenic array of literature and experiences, and specific, practical recommendations based on experiences reported in the CIRCLE-2 survey and interviews with people in the field that readers can easily apply in their day-to-day work.

The basis for CIRCLE-2 findings

In order to arrive at the set of considerations and recommendations presented in this research policy brief, three activities were performed. First, a literature review explored what is known about effective knowledge sharing and development between industrialized and developing countries in the area of climate change adaptation research. This revealed that relevant papers either deal with very generic theoretical considerations about transfer, sharing or development of knowledge on the one hand, or with the content and output of collaboration in specific case study situations, rather than with (the effectiveness of) the knowledge sharing and development process. While some scientific studies are available on knowledge transfer for mitigation (e.g., the transfer of low-carbon energy technologies from industrialized to developing countries), papers concerning project collaboration and knowledge transfer for climate change adaptation are as yet scarce.

In particular on the international level, adaptation in developing countries gets a lot of attention (see Box page 5 on adaptation policy context). One may expect that experiences gained in the context of the UNFCCC and the Kyoto Protocol (e.g., the Adaptation Fund, Special Climate Change Fund, Least Developed Country Fund, Clean Development Mechanism) would have led to the evaluation of the effectiveness of the associated programmes. But the related studies are usually confined to macro-level statistical trends following changes in policy development rather than systematically addressing how organisations and project collaborations function and how this influences knowledge sharing and development. Studies addressing the latter often relate to organizational theory concerning private enterprises and the knowledge management within and between firms, a context different from climate change adaptation research and practice. While some of the cited factors facilitating cooperation and transfer of knowledge may be valid across different situations, lessons from this literature have to be interpreted with caution. Therefore, as a second step, a survey was done based on an electronic questionnaire that was distributed to relevant experts identified by the authors as well as through the CIRCLE-2 network. A total of 82 respondents, about 40% of which from developing countries, completed the questionnaire. As a third step, seven respondents were selected for face-to-face or telephone interviews to further clarify answers provided and to collect more in-depth insights.

Structure of this document

This research policy brief first describes different types of knowledge and how these can be embedded in institutions. It discusses different means to share and develop meaningful knowledge. Finally, a number of barriers for effective knowledge exchange are summarized and good practice principles are proposed that can be taken into account when developing, funding or implementing collaborative adaptation projects. ■

Sharing, developing and embedding knowledge

From knowledge transfer to sharing and development

In order to effectively incorporate knowledge sharing and development in collaborative research programmes and projects, a common understanding of these terms is required. In this research policy brief, "knowledge" is understood to represent information and skills acquired through experiences and education. Knowledge "transfer" might be seen as a one-way process, while knowledge "sharing" or "exchange" represents a mutual learning process. The main aim is to raise awareness and to initiate a change in the person or institution receiving the information/ knowledge. Manifesting itself as a change in performance and function of the receiver, or in more implicit behavioural ways, it can be difficult to discern. One way of trying to measure knowledge transfer or sharing is through changes in action, performance and efficiency among the receivers of knowledge. Knowledge can be embedded in the (human) members of organizations, the tools and procedures used (including both hardware and software) and in their goals and tasks. Since the process of sharing, learning and internalization of knowledge is a dynamic process, the term "knowledge sharing and development" is used here. Although related or overlapping concepts such as knowledge management and knowledge brokerage are recognized, they are not explicitly discussed here. ▸

Figure 1. Knowledge in the process from data to behavioural change. Adapted from Ajmal and Koskinen (2008).

From data to behavioural change
"Knowledge" should be distinguished from "data" and "information" which in itself does not constitute knowledge, or leads to changes in behaviour. "Data" as unprocessed raw facts can be organized to produce "information", which in turn can be sorted and structured in order to meet the requirements of a specific group of users ("contextual information"). Only when data is transformed to contextual information individuals can take it up effectively and transform it into "knowledge". It then depends on the individual' experiences, attitudes and the context in which he/she works whether the acquired knowledge indeed leads to changed behaviour (Figure 1). If one does not follow all of these steps, a loss of meaning may result and the effectiveness of knowledge sharing and development will be low. Collaborative adaptation research or capacity building programmes and projects should take these steps into account.

Tacit knowledge and explicit knowledge
Knowledge comes in the form of either tacit (socially ingrained) knowledge or explicit knowledge that can be codified and transmitted through language. Both types of knowledge are essential for effective sharing and development of knowledge. The design of programmes and projects, and the methods and tools used, should take this into account. Virtual projects and the use of virtual assistance tools such as e-mail, internet conferences and other remote communication are effective in the transfer of codified knowledge, but they cannot, in the same effective way, transfer related sensory information, feelings, intuition and non-verbal communication that are important for the ultimate implementation of sharing and developing knowledge.

In research projects, the sharing of explicit knowledge is usually emphasized, through documents, web-based information, electronic meetings and telephone conferences. However, sharing of tacit knowledge may be as relevant for knowledge sharing to be effective.

> ***Only when data is transformed to contextual information individuals can take it up effectively and transform it into "knowledge"***

For learning tacit skills, routines and ways of work of others, collaboration and socialisation are extremely important. The conversion of tacit knowledge to explicit knowledge (externalisation) implies the identification of socially ingrained knowledge and making it explicit to better understand framing and behaviour of participants in the knowledge exchange process. Equally important is the conversion of explicit to tacit knowledge (internalisation), i.e. gradually incorporating knowledge available through external means, like documents and websites, into people's behaviour.

From personal to institutional knowledge
Until knowledge becomes organisationally established, or routinized, it is very vulnerable because it resides in specific individuals. The more project-oriented an organisation is, the more knowledge is personal and the less it is rooted in the organisation. For collaborative climate change adaptation projects, it is not only important to share knowledge between persons and build personal capacity, but also to institutionalize knowledge in organizations. This will make knowledge more effective and sustainable, especially in a world in which people frequently change roles and jobs. It is therefore important for projects to implement routines in organisations in order to transfer and share knowledge in an efficient way, e.g. by establishing "bridging structures", connecting the project and learning by individuals to the regular activities of the organisation. ■

Means of knowledge sharing and development

A combination of means is usually required
The effectiveness of knowledge sharing and development depends on the means that are used – different means have different advantages and disadvantages in different situations. Often it seems prudent to combine different means. The main three ways to transfer and share knowledge are electronic (email, telephone, skype, web-conferencing, websites, blogs, electronic surveys, social media), face-to-face interactions (project meetings, seminars, courses, workshops, summer schools, conferences, interviews), and literature (journal papers, books, reports).

Electronic knowledge exchange and its limitations
Technological advances have greatly enhanced the potential volume of information to be shared and the frequency, reach and scope of communication between project participants in industrialized and developing countries. At the same time, there may still be technical limitations in many situations that have to be considered. Overly relying on electronic means of information exchange can lead to information overload and an unproductive imbalance between information technology and people. In starting collaborative research projects between European and developing countries, experiences show that quite often the very initial contact can be reliably made via e-mail and internet telephone. The informal and quick character of email may be very useful between people who know and trust each other well, but it is particularly difficult to interpret the quality of the information shared in this way. More importantly, it is not the best way to build relationships and trust, which are required to successfully develop knowledge exchange programmes. When using electronic means to involve people beyond the core project team in an open process (e.g., stakeholders, respondents to questionnaires), the resulting audience involved may be biased and not representative for the intended target group. Online climate knowledge platforms (sometimes called knowledge brokering platforms) have recently increased rapidly. While they offer a large amount of information, they are usually supply-driven, assuming that more is better. The funders, developers and managers of these platforms should ensure that their design and content is aligned with the needs of the target user community, possibly as one mechanism for knowledge sharing and development amongst a menu of diverse approaches.

Workshops and other face-to-face meetings
Different methods can be applied in collaborative climate change adaptation projects to support the development of problem-oriented outcomes. While nowadays electronic means may be an excellent way for day-to-day interactions between partners in different locations, a sufficient number of face-to-face meetings are crucial to share tacit knowledge and build trust, in order to effectively enhance mutual learning. Especially at the beginning of collaboration, the e-mail contacts can be used to prepare a workshop to meet the partners face-to-face. It is crucial to get a feeling for the "collaborative potential" of the relationship and the mutual understanding of the research activities early in the process. In formats like courses, seminars and conferences one-way communication often dominates. The CIRCLE-2 survey confirmed the compelling advantages of interactive workshops for effective knowledge sharing in problem-oriented climate change adaptation research programmes and projects. Such workshops can take many shapes, but generally represent an educative ▸

activity facilitated by skilled facilitators and characterized by an interactive programme, using methods such as brainstorming, mind mapping, gaming, or feedback sessions. This helps the participants - based on their own experiences - to jointly develop, or co-create new knowledge and solutions to climate challenges. As early as at the first workshop, "hands-on" approaches should be included to enhance understanding for the respective challenges, experiences and needs. This need for developing a a deep thorough understanding of each other before starting to engage in the actual research is often underestimated and – if not taken well into account – almost certainly will reduce future success.

> ***"Hands-on" approaches should be included to enhance understanding for the respective challenges, experiences and needs***

Written information
In practically all research-related activities as well as in knowledge sharing and development, written information through reports, scientific articles and other paper-based means plays a very important role.
The advantage of written information is that it forms a huge database of earlier knowledge and experiences and, nowadays, is largely available in electronic format (see above).
One disadvantage is that written information is limited to explicit knowledge, not capturing tacit (relevant non-verbalized, intuitive, and unarticulated) knowledge.

The value of written information has to be interpreted in the local context. In developing countries, costs of subscriptions can limit accessibility to scientific journals. Various publishing companies as well as collaborative programmes, such as Research4Life (see http://www.research4life.org/about/), aim to provide developing countries with free or low-cost access to academic publications, to empower universities, colleges, research institutes and government ministries as well as non-governmental agencies and hospitals with access to scientific knowledge.

Explore new methods to engage stakeholders and co-create new knowledge
Many projects in the CIRCLE-2 survey applied top-down methods to assess climate change risks, such as downscaling of global climate change projections and application of impacts models to determine potential impacts, e.g. hydrological models or models to analyse impacts on crop yields. To support development of adaptation strategies, the survey suggested that methods such as scenario development and planning, gaming and role playing should be explored. These practice-oriented, interactive methods can play a large role in facilitating collaboration and learning but are not yet being used to the extent possible. Economic models or other methods to evaluate socio-economic consequences of climate change impacts and costs of adaptation measures can be important for engaging local decision makers, provided that meaningful data can be made available. ■

Barriers to effective knowledge sharing and criteria for success

A wide variety of barriers have to be addressed
Even by taking relevant knowledge and methods into account while designing knowledge sharing and development programmes and projects, many practical barriers still remain. The literature identifies barriers that can limit the effectiveness of knowledge transfer that also apply to knowledge sharing and development: lack of trust, lack of relevant knowledge, uncertainty about project objectives and process, technological infrastructure differences, physical distance, cultural diversity, language barriers, incompetence and lack of skills or motivation.

Success criteria to address pertinent barriers to knowledge sharing and development
The CIRCLE-2 survey generally confirms that these barriers identified in the literature decrease the effectiveness of knowledge sharing and development, and allows them to be ranked in order of importance for the area of climate change adaptation. Conversely, absence of these barriers generally promotes success.

Figure 2 shows the factors that, according to the survey respondents, have an impact on knowledge sharing and development. The interviews confirmed these findings.

The various success factors can be grouped into five categories:

a. Lasting partnerships and adequate stakeholder engagement
b. Demand-driven objectives and design
c. Dialogue on normative adaptation dimensions
d. Adequate time and funds
e. Suitable mix of knowledge sharing methods

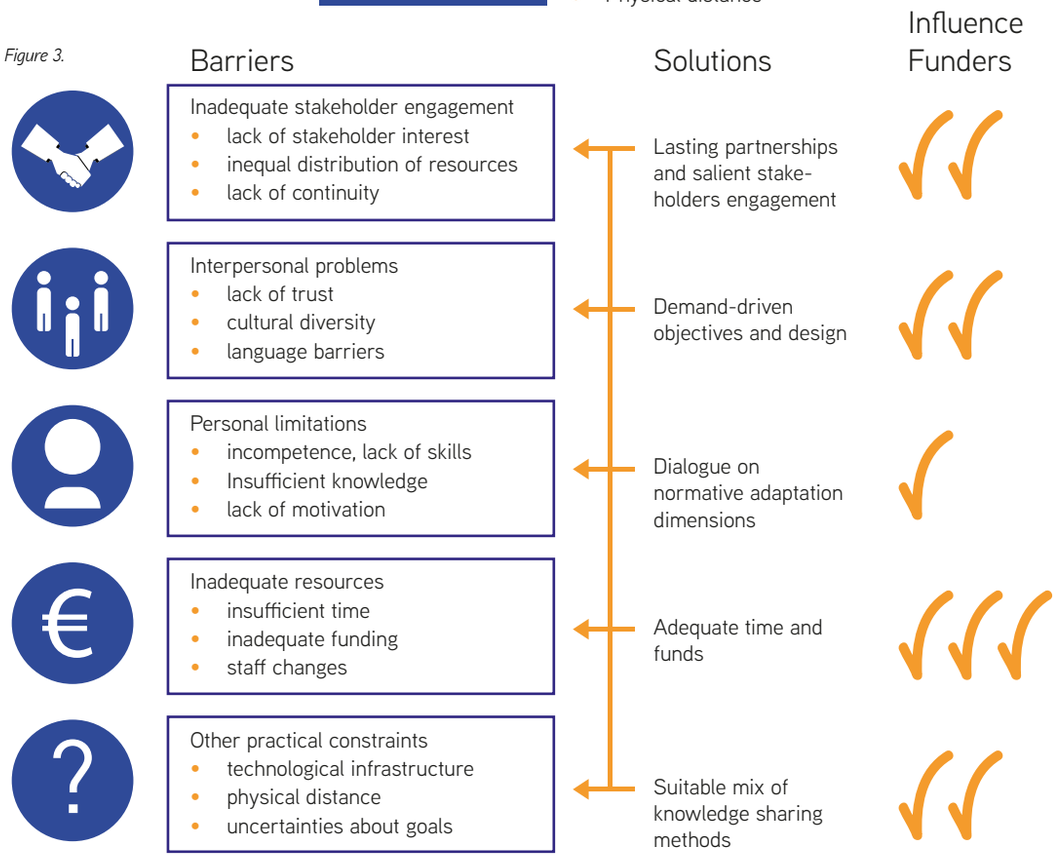
The various ways in which the barriers can be addressed to foster effective knowledge sharing and development are synthesized into five "good practice principles" (solutions) for effective knowledge sharing and development in climate change adaptation. Most of these good practice principles address more than one barrier. Figure 3 also suggests to what extent these good practice principles can be addressed by agencies funding or managing climate change adaptation research programmes and projects.

Lasting partnerships and adequate stakeholder engagement
Effective engagement of stakeholders is the most important basis for effective knowledge sharing and development that emerged from the literature, survey and interviews. However, in practice it is a major challenge to engage relevant stakeholders actively at the right time and in an effective way. In adaptation-related research, knowledge sharing frequently plays a marginal role as research is often conducted by "external experts" and not in cooperation with, or led by, national or country-based researchers. Adaptation knowledge-sharing requires not only the right set of partners in developing countries, but also their involvement at an equitable and adequate level in all phases of a project cycle. Involvement of local "champions" can help to enhance the effectiveness of stakeholder engagement, while at a more distant level, political support to the project's goals and results should be fostered.

Therefore, a sufficiently wide range of stakeholders from various institutional background and administrative levels should be actively involved, also beyond the core project team. Whereas a fair number of researchers, ▸

Figure 2.

Figure 3.



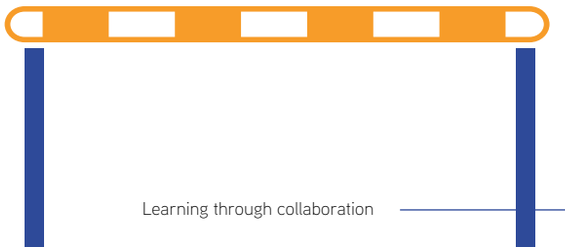
policy makers and NGOs from developing countries in the projects and programmes were captured by projects in the survey, the involvement of the private sector was relatively small. Involvement of private sector partners can and should be considered when designing calls. In European research funding, public-private partnerships are increasing as a way both to conduct research but also to implement practical solutions to climate change adaptation challenges. Adaptation projects mostly require the engagement of the informal sector (the part of the economy that is not taxed or monitored by government) and those who are most vulnerable - even if for this group data may be difficult to obtain and their involvement represents a challenge. If these groups are to be part of the solution, they have to be/take part in the projects/programmes.

Demand-driven objectives and design

Literature, survey and interviews all support the good practice principle that adaptation knowledge-sharing is more effective if designed according to the needs (i.e., of developing countries), and not on the basis of offering available knowledge (i.e., from European countries). While this may seem evident, in practice it is not. Research priorities and experiences in adaptation research in Europe can only provide broad theoretical guidance on relevant adaptation knowledge challenges in developing countries. Due to the overlap with development processes, knowledge-sharing in the field of adaptation can involve a wide variety of actors and institutions. It is impossible to identify priority actors or target groups from a theoretical perspective of adaptation alone. The scope of adaptation knowledge needs can range from legal or policy-related aspects, to meteorology and climate services, to practical agricultural challenges. The relevant questions and areas for knowledge exchange in developing countries must be defined with practical adaptation challenges in mind. This would increase both the value of the research for the developing countries but also their active engagement in the projects and the adoption of their results. Project proposals should include a demonstrable motivation of what the demand of the developing country is that is lying behind the project objectives. When projects involve both researchers in developed and developing countries, shared interests will enhance knowledge sharing and effectiveness, e.g. by twinning projects with similar challenges.

Dialogue on normative adaptation dimensions

From the perspective of research funding or managing institutions, it may be easier to apply the other principles (lasting partnerships and adequate stakeholder engagement, demand-driven objectives and design, adequate time and funds, a suitable mix of knowledge sharing methods) rather than to address barriers related to normative factors and to poor interpersonal relationships. The CIRCLE-2 analysis suggests that effective adaptation knowledge sharing requires the normative dimensions of adaptation knowledge to be



identified, disclosed and discussed. In this context it should be noted that knowledge can be regarded as an asset that requires security, providing leverage over others - the competitive environment within an organization is one of the most relevant factors impeding open knowledge exchange. Uncertainty or lack of awareness of the value of the information or lack of initiative and strategy by the project co-workers can be caused by inadequate information systems and lack of time and resources.

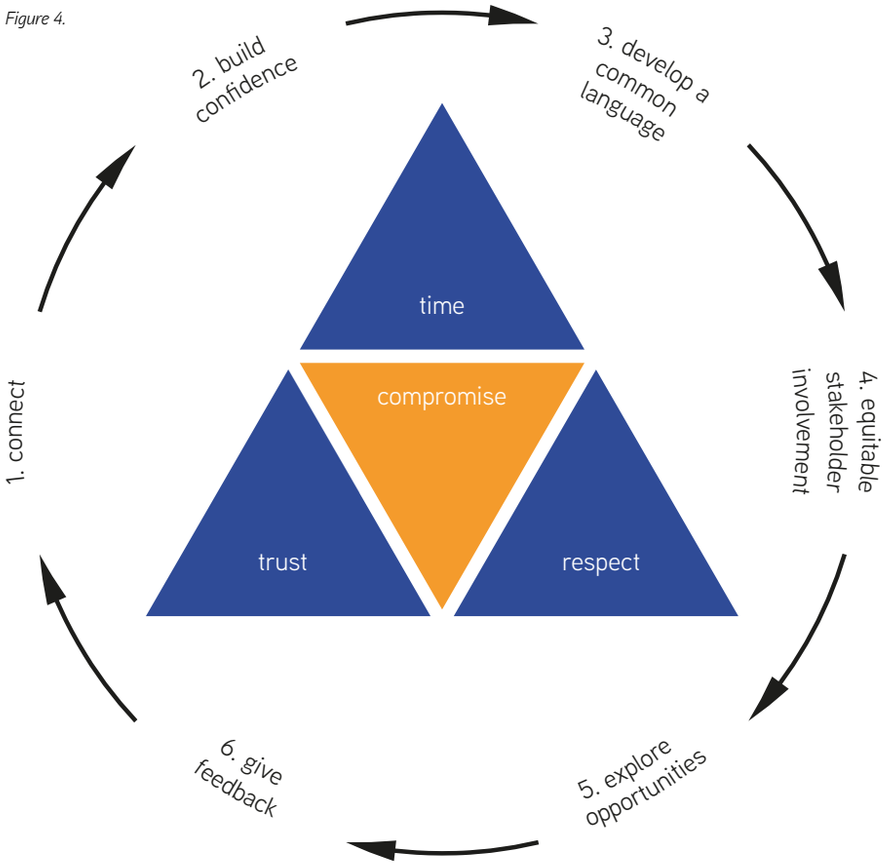
Adaptation knowledge entails many context-specific risks, uncertainties and normative dimensions that might need to be translated, adapted or appropriated by actors in a specific context. This does not only allow participants and stakeholders to better understand each other's positions and framing of the issue, but can also help to generate solutions to problems that are supported by the stakeholders. As a necessary first step, practitioners in adaptation knowledge exchange should therefore identify and discuss these normative dimensions.

How this can be stimulated is illustrated in Figure 4: connect, build confidence, develop a common language, involve stakeholders equitably, enhance opportunities for dialogue and give feedback, taking into account four factors: sufficient time, trust, ability to compromise, and respect. The specific institutional setting of the personal interactions is extremely important. This pertains both to the specific conditions that projects find themselves in (with limited time, possible lack of institutional routines, and spatial and personal distances that the project members may have); but it also pertains to the specific nature of human knowledge and how the practice of knowledge sharing and development differs between projects, depending on what type of knowledge (tacit, explicit) is transferred, shared or developed. These two issues—personal interaction, and the place and type of the knowledge to be shared —can be seen as two dimensions of knowledge sharing which both need to be addressed in order for effective knowledge sharing to occur.

Too short or underfunded projects are likely to fail and hence be a waste of resources

Adequate time and funds
The issue on which funders and managers of collaborative climate change adaptation programmes and projects have most influence, is that adequate time and resources are required for successful collaborative knowledge exchange projects. Survey and interview results suggest that a project period of at least 2-3 years is essential, including the start-up time requirements of projects - time is required to meet with partners, to engage stakeholders, to agree on common goals and procedures, and to build trust. In terms of financial resources, project teams should have adequate resources to be able to work continuously in the project over the full project cycle, including time for frequent and in-depth face-to-face meetings and other collaborative activities. Involving partners with budgets insufficient for serious engagement should be avoided. Too short or underfunded projects are likely to fail and hence be a waste of resources. In greater funding programmes, it is prudent to consider time and funds for piloting projects on adaptive measures and their implementation first, before going into larger scale projects.

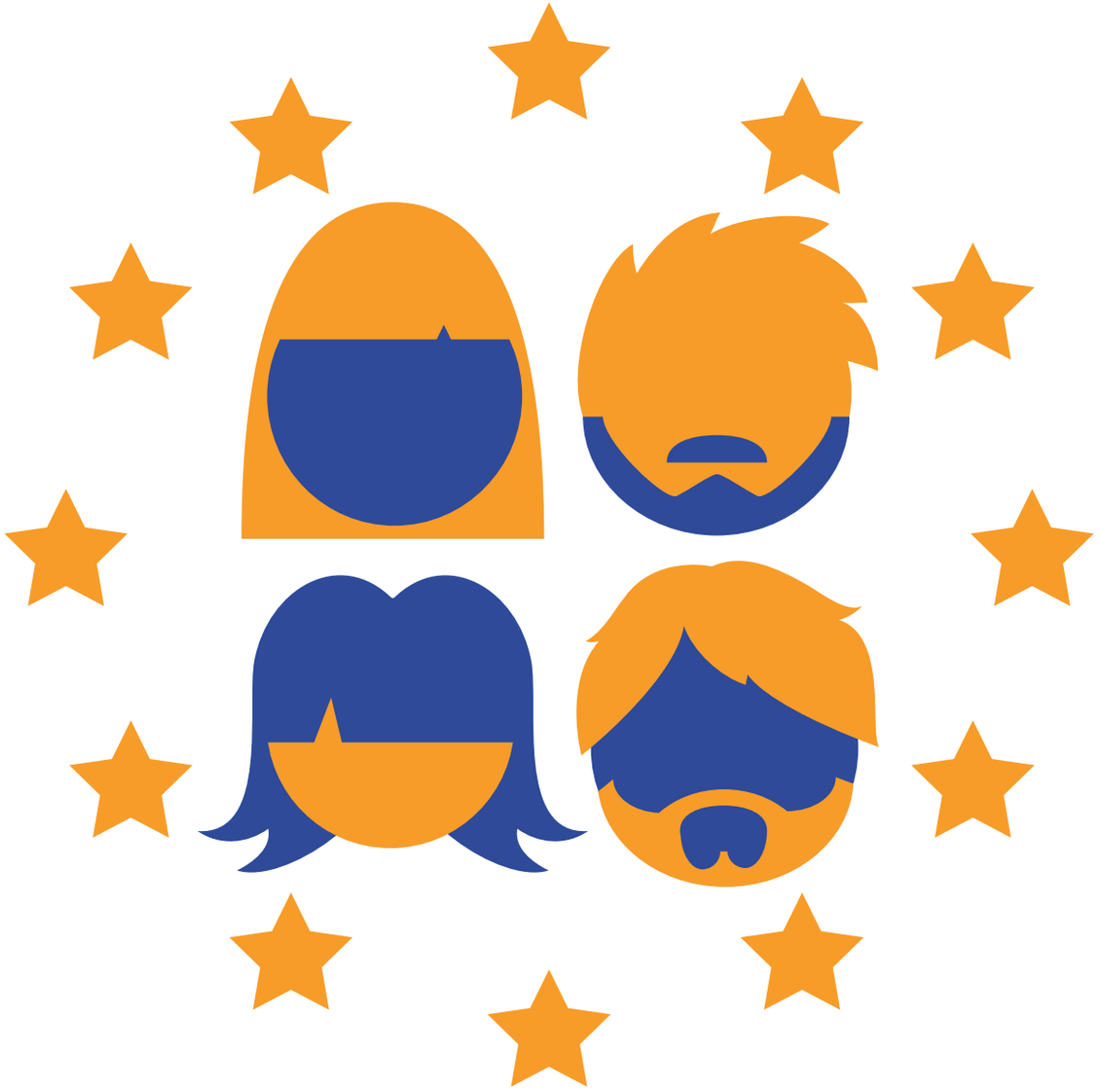
Figure 4.



Suitable mix of knowledge sharing methods
Recognizing that there is no one-size-fits-all solution and different methods and tools are likely to provide different, complementary answers, ideally projects should use a variety of knowledge exchange methods. While downscaling climate projections and running impacts models is meaningful to identify climate risks, to support adaptation strategy development an additional set of methods and tools is required. Generic electronic platforms for knowledge sharing in the field of adaptation and written information in the form of reports and papers (explicit knowledge) should be complemented by formats that foster experience-based learning, and allow for the identification and exchange of tacit knowledge and co-creation of new knowledge. An appropriate share of funds may be allocated to small interactive workshops with more opportunities for exchange of knowledge and communication, rather than to bigger conferences. In such workshops a variety of methods can be applied, including scenario planning, gaming or role playing. ■

Conclusions

The analysis of characteristics of programmes and projects shows that capacities to manage change and transition processes are a key element of adaptation to climate change. This requires not only sound data and information but also sound analytical capacities to define adaptation processes, supportive infrastructure and, not least, possibilities for learning and innovation. Knowledge sharing and development plays an important role in this setting, both in the industrialized countries as well as the, generally more vulnerable, developing countries. Lasting partnerships and adequate stakeholder engagement, demand-driven objectives and design, dialogue on normative adaptation dimensions, adequate time and funds, and a suitable mix of knowledge sharing methods are proposed as five key characteristic for programmes and projects developed for this purpose. European countries should give knowledge sharing and development a central position in their efforts to support adaptation to climate change internationally, in close collaboration with partners in developing countries. As a result, enhanced knowledge and skills can improve the effectiveness of adaptation projects funded either bilaterally or in the context of international programmes. Such programmes can be practice-oriented, such as those in the context of the UNFCCC/Kyoto Protocol's Adaptation Fund, Special Climate Change Fund, and Least Developed Country Fund. They can also be policy-relevant and transdisciplinary, but of a more process-oriented, theoretical nature, such as the research agenda proposed by UNEP Programme of Research On climate change Vulnerablity, Impacts and Adaptation (PROVIA, see UNEP, 2013) and the Future Earth Programme (ICSU, 2013). In Europe, the Joint Programming Initiative Climate may want to take the recommendations in this policy brief into account. ■



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Colophon

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