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Preparing fisher folk for Climate Change: Communication Strategies

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Climate change has become a worldwide concern, increasingly impacting the livelihoods of individuals in both the global north and south. The need to develop effective adaptation and mitigation strategies in the south has become crucial to securing livelihoods and community development. A critical element in promoting effective and successful adaptation and mitigation strategies is communication. Originally presented as a complex and abstract scientific problem, climate change information is now shared and discussed among various disciplines and stakeholders. Effective communication among stakeholders can help to identify problems, raise awareness, encourage dialogue, and influence behavioural change (Johnson 2011; Moser 2010; Nerlich, Koteyko & Brown 2010). However, in order to communicate climate change effectively, it is important to understand and acknowledge how individuals and communities think about, interpret, and discuss the causes, issues, and possible adaptation and mitigation actions (Africa Talks Climate, BBC World Service Trust 2010).

Communication, Knowledge, and Learning

The broad view of communication is that of an exchange of information through mediation, which in turn can influence the formulation, transfer, and reception of the shared information (Silverstone, 2005). Mediation techniques can include traditional, linear broadcast-style approaches, participatory and social media, citizen-led grassroots approaches including street theatre and storytelling, and other forms of knowledge intermediary and brokerage work (Fisher and Kunaratnam 2007; see also Rothenbuhler & Coman 2005). For Castells (2007), mediated communication and information are rooted in historic social forms of power and counter-power, of domination and social change. In this sense, mediated messages play a key role in influencing people's perceptions on social and political issues (Carvalho 2010; Silverstone 2005). In the context of climate change, mediated communication can have a direct impact on the ways in which an individual or community frames, views, and reacts to climate change challenges. (Johnson 2011; Carvalho 2010; Nisbet 2009).

Climate change has emerged as a key concern for international development organisations, since related changes will have a disproportionate impact in the development world, where the world's poor remain most susceptible to the potential damages and uncertainties inherent in a changing climate. Most of the 36 million fisherfolk will be directly or indirectly affected by human-induced climate change. However their awareness and knowledge level about this phenomenon is relatively low. Climate change in a socio-psychological perspective is a typical first degree case of collective action dilemma which humanity is confronted with and the gravity of which is exacerbated

when it is manifested in an open access marine ecosystem context already ravaged by ineffective management regimes that threaten its sustainability. (giving the Hardinian metaphor of the 'tragedy of the commons' deeper dialectical significance).

Building an ethos of informed and responsible stewardship among all the stakeholders, both fisheries dependent and independent, is the need of the hour in the context of climate change preparedness. It is paradoxical to see that the increasing quantum of climate change knowledge being generated is threatened by an increasing emergence of climate deniers in the post-Kyoto and IPCC scenario. The social trust deficit needs to be corrected through innovative research approaches of multi-disciplinary and epistemological synthesis.

The role of communication research in this context is envisaged as multidimensional going beyond the conventional, end-of-the-pipeline extension logic of delivery and transfer of technology or knowledge. The ecosystem well being is mediated by the anthropocentric harvest and post-harvest decisions which, unfortunately, are vitiated by an apparent disconnect that exists not only between the marine ecosystem and the human subsystem but also among the multiple members of the stakeholder constituency within the human subsystem. It is here that the conciliatory as well as therapeutic value of the Habermasian logic of a communicative action needs to be appreciated and bolstered through tangible interventions.

There is a consensus among marine fisheries experts that the fish stocks will be more robust to climate change if the combined stresses from overfishing, habitat degradation, pollution runoff, land-use transformation, competing aquatic resource uses and other anthropogenic factors are minimized. This calls for attempts in developing and applying institutions and mechanisms that aim effective adaptive management under the current as well as predicted climatic, oceanographic and biological conditions.

Climate change preparedness being a more phenomenological than an ontological pursuit demands the active engagement of all stakeholders on the entire knowledge chain. Thus the foremost research question is how to make it happen? This leads to a battery of related concerns like the current level of awareness on the issues of climate change, role of mental models that could act as noise affecting risk perceptions, cognitive and non-cognitive barriers in communication fidelity, access and acceptability of communication channels, level of appreciation of the scientific approaches in climate change research, possibility of incorporating indigenous ecological wisdom in climate change modeling, the fuzziness of cause-effect relationships, the temporal and cumulative dimensions of the projected manifestations, the conflict in the collective versus individual responsibilities, and the level of uncertainty already existing in the marine fisheries science underlying the management and governance mechanisms.

It is by taking cognizance of these concerns that the objectives of the project have been framed expecting as much strategic resolution as possible towards the project culmination and exit. It can be seen that the objectives follow a methodological chronology commencing from context profiling and

climate change communication needs assessment, linguistic harmonisation of core concepts, identification of cognitive drivers and barriers, measurement of behavioural parameters like risk perception, conservation orientation, media preference, etc., documentation and validation of indigenous knowledge, designing and validation of communication tools and strategies, upscaling and mainstreaming of multistakeholder interface platforms using web-based technologies. The entire process is conceptualised to take place in an overarching framework of participatory co-learning mode where pluralistic and multidisciplinary perspectives are consciously engendered.

Potential stakeholders

The potential players in this area consists of varied stakeholders that include fishermen, fisherwomen, fisher leaders, fish traders, exporters, processors, vendors, consumers, scientists, researchers, academicians, fisheries administrators/managers, media persons, officials and fisheries policy makers in both India and Australia.

Climate change will significantly affect people and places all over the world. People living in poverty are particularly vulnerable due to their living conditions, poor access to health services, and often inadequate food and water supplies. Unpredictable seasonal variation, more frequent extreme weather events, sea-level rises and salination of land are disrupting people's lives, particularly in the majority world. The outcomes: increased food and water insecurity, resource scarcity, conflict and more uninhabitable land. The impacts are expected to be most severe for people in the majority world – those least responsible for climate change. Changes in weather, salination of land and reduced access to water will hit small and subsistence farmers the hardest. Fisher people are vulnerable to changes in the ocean's temperature causing the loss of traditional fishing grounds. With fewer resources, majority world people have less capacity to adapt to, and mitigate, the impacts of climate change.

Existing economic and social disparities will worsen and development challenges will be set back. For the majority of the world's population the 'right to develop', as protected by the internationally-endorsed United Nations Declaration on Human Rights, is in question.

A growing climate justice movement says that the wealthy should bear the responsibility and costs of reducing emissions as they are the ones who have benefited most from the economic development that has caused climate change. Climate change impacts are mainly felt as increased salinisation of arable land due to sea level rise. Erratic weather conditions bringing more floods, droughts and cyclones which reduce freshwater supplies and damage crops. Degradation of coral reefs and associated ecosystems as oceans warm. Loss of food sources as tuna and other species move to cooler water. Increases in pests and disease-carrying insects which thrive in the warmer, wetter conditions. People face the consequences of having to leave their home country or village. In some cases this is already a reality. All these affect the food security of the country. There is the primary need for assisting the fishermen to achieve food security.

This challenge is most critical in low-income, food-deficit countries where little progress in food production has been made in recent decades, leading to a dramatic increase in the number of chronically undernourished people.

The challenge of ensuring food security in developing countries calls for new technologies, skills, practices and ways to collaborate. Most importantly, farmers must be able to communicate with peers, local authorities and institutions and have access to relevant knowledge and information, including technical, scientific, economic, social and cultural information. It is essential for rural people to be able to respond productively to the opportunities and challenges of economic and technological change, including those that can improve agricultural productivity and food security. However, to be useful, information must be available to the users in appropriate languages and formats. At the same time, it must also be up-to-date and communicated through appropriate channels.

Since the beginning of the 1990s a dramatic expansion in information services and a proliferation of technological innovations has permeated virtually all spheres of human activity. The depth and the extent of these processes appear limitless and have had much greater social, economic and cultural implications than experienced during previous technological advances. The so-called Information Age, characterized by a world-wide increase in the reach of mass media and the emergence of the Internet, is affecting the way we communicate, create relationships and undertake transactions, opening up new opportunities and challenges. Developing countries have not been excluded from these processes. Despite the seemingly huge difficulties in infrastructure development, their governments have taken steps to adapt to the new digital environment and to avail themselves of new tools, products and services.

With the emergence of new opportunities there is however a growing concern about a new kind of threat to global development which has fuelled an animated world-wide debate over the social impact of ICTs on the lives of people. In the North-South context discussion has focused on the role of technology in widening or narrowing the knowledge gap between rich and poor countries. The situation is even more dramatic for people in rural and isolated areas of developing countries, where access to basic telecommunication services and educational resources can make a real difference in combating poverty and improving living conditions. These people have no access to the mechanisms that would enable them to voice their opinions, communicate with authorities and the main development actors or increase their participation in decision-making processes. The gap is thus growing not only between North and South, but also, and more dramatically, within the South, between the urban elite and middle classes and the most underprivileged populations living in rural areas.

Impressive breakthroughs in information technology and its increasing presence in everyday life have led some observers to believe that ICTs would provide immediate solutions to development

problems. The initial optimism of these technology enthusiasts has been tempered in more recent years by a close scrutiny of actual technology applications at the local level.

Fisher folk need to be educated about climate change. As climate change related impacts grow in developing countries, there is an increasing need to develop innovative approaches which help vulnerable populations to better cope with, mitigate and adapt to the effects of both short and long term climatic effects. Alongside the momentum gained by climate change within national and international agendas, research in the field has risen exponentially – albeit from a very small and recent base – opening new ground for emerging fields of study where traditional climate change science, development studies and the application of innovative tools converge.

There is a need for gathering, analysing and disseminating climate change information through locally appropriate tools such as print media (news paper, pamphlets, leaflets, and bulletins and using mass media including electronic media such as community radio, SMS, Internet access points, community video and other interactive multi-media) as well as traditional media such as folk songs, folklore, puppet shows, “Yakshaganas” and theatre performances unique to each geographical coastal region. These constitute key factors for capacity strengthening and empowerment within vulnerable communities. Research in this field could explore ICT (Information communication Technology) enabled participatory monitoring mechanisms, and the way in which they can contribute implementation of bottom up approaches in the climate change field. Use of ICTs plays a key role in the field of disaster management and response for fisher folk. Research in this area could explore the links that exist between ICT enabled monitoring in key vulnerable hotspots, to be identified by local communities with the support of both digital and non-digital ICT tools. Research could include the role of ICTs in disaster prevention and planning in key vulnerability areas, and the way in which this potential could be articulated into comprehensive/national or regional climate change strategies.

Developing participatory videos could be undertaken in this project. Participatory video (PV) is a set of techniques used by a group or community to help them shape and create their own film. Making a video can be easy and accessible to all, and PV is a great way of bringing people together to explore issues, voice concerns or simply be creative and tell stories. This is an empowering process: enabling a group or community to take action to solve their own problems and also to communicate their needs and ideas to decisionmakers and/or other groups and communities. As such, participatory video can be a highly effective tool to engage and mobilise people and to help them implement their own forms of sustainable development, based on local needs. When using participatory video for monitoring and evaluation, we combine the iterative and highly responsive nature of the former with the more systematic structures of the latter, providing a rigorous but engaging process that includes triangulation of different evidence sources. Participatory Videos play a key role in further involving community members in discussing how climate change affected/was affecting the lives of fisher folk and their suggestions for pilot adaptation projects (in the baseline process). It also

contributed to monitoring and evaluating both these adaptation projects and climate variability. Both the production of the films and the diffusion of local voices on adaptation to climate change are key aspects in the project as they allow for increased participation in the action research process. The video products would help raise people's voices so they could be heard by decision makers who would subsequently show the films as part of each local dissemination strategy.

Definition of the problem: Climate change is predicted to have a range of direct and indirect impacts on marine capture fisheries, with implications for fisheries-dependent economies, coastal communities and fisherfolk. Capture fisheries are largely driven by fossil fuels and so contribute to greenhouse gas emissions through fishing operations, transportation of catches which are uncertain due to modes and distances of transportation, but may exceed those from fishing operations. Mitigation measures may impact on fisheries by increasing the cost of fossil fuel use. Fisheries and fisherfolk may be impacted in a wide range of ways due to climate change. These include biophysical impacts on the distribution or productivity of marine and freshwater fish stocks through processes such as ocean acidification, habitat damage, changes in oceanography, disruption to precipitation and freshwater availability. Fisheries will also be exposed to a diverse range of direct and indirect climate impacts, including displacement and migration of human populations; impacts on coastal communities and infrastructure due to sea level rise; and changes in the frequency, distribution or intensity of tropical storms. Fisheries are dynamic social-ecological systems and are already experiencing rapid change in markets, exploitation and governance, ensuring a constantly developing context for future climate-related impacts. These existing socioeconomic trends and the indirect effects of climate change may interact with, amplify or even overwhelm biophysical impacts on fish ecology. The variety of different impact mechanisms, complex interactions between social, ecological and economic systems, the possibility of sudden and surprising changes make future effects of climate change on fisheries difficult to predict.

The vulnerability of fisheries and fishing communities depends on their exposure and sensitivity to change, but also on the ability of individuals or systems to anticipate and adapt. This adaptive capacity relies on various assets and can be constrained by culture or marginalization. Vulnerability varies between countries and communities, and between demographic groups within society. Generally, poorer and less empowered countries and individuals are more vulnerable to climate impacts, and the vulnerability of fisheries is likely to be higher where they already suffer from overexploitation or overcapacity. Adaptation to climate impacts includes reactive or anticipatory actions by individuals or public institutions. These range from abandoning fisheries altogether for alternative occupations, to developing insurance and warning systems and changing fishing operations. All these situations warrant an immediate need to educate the fisher folk on what is climate change, how they are affected by climate change, the effects of climate change on fishing stocks, the change in migratory patterns of fishes, availability of fishes and ultimately the threats

posed to food security and sustainability of the marine resources. Extension is education and education is to bring about favorable changes in the behavioural components such as changes in knowledge (Cognitive) attitude (affective) and skill (psychomotor domains). This project aims at bringing the people close to the phenomena of climate change, awaken them and educate them about the serious impacts

and implications of climate change by creating an all-round awareness at the strategic coastal villages which are hot spots of climate change through employing a wide variety of communication media such as print, electronic and mass media, including ICTs, multimedia and traditional media.

Immediate objectives that has to be addressed to stakeholders

1. Diagnose and juxtapose the climate change communication contexts using Co-Learning /participatory approaches to identify the various knowledge (cognitive), attitude (affective), skill (psychomotor) drivers and barriers.
2. To Document citizens ecological wisdom and to validate its scientific rationale and to explore its potential as a tacit compliment to or source enhancement to scientific logic /models and tools for adaptation and mitigation.
3. To develop and mainstream multi-stakeholder science-policy-Community interface platforms for continued Climate change communication and knowledge exchange using advanced ICTs.
4. To explore the epistemological dimensions of multidisciplinary knowledge partnerships through meta communication analysis.

Long term objectives

To Design and validate cost effective communication tools and strategies for the exchange and mainstreaming of climate change knowledge.

Educational efforts for fisherfolk at International level:

International Status

In recent years, extreme climate events have negatively impacted many parts of the globe, but due to its already high vulnerability, Sub Saharan Africa has been the theatre for some of the early and more dramatic climate impacts. This has affected most significantly the livelihoods and health of the most deprived people. As observed in the countries concerned by this case study (Malawi, South Africa, Kenya and Zimbabwe), droughts, floods, extreme temperatures have caused successive crop failures, the drying up of water sources and the spread of malaria to locations where it was not endemic (Koelle et al 2010; Wakhungu et al 2010; Zvigadza et al 2010). Between 2008 and 2011, Community Based Adaptation in Africa (CBAA) – an action research project – tested tools for community adaptation and knowledge generation in eight African countries while building the capacity of its partners and local communities. Through participatory methods, the project helped the selected communities to adapt to climate change and share lessons learnt with key stakeholders at local, national, regional and international levels. The International Institute for Environment and

Development (IIED) invited InsightShare to pilot participatory video for monitoring and evaluation (M&E) of this project to support their internal learning processes, inform the action research, and amplify community voices in relation to local adaptation to climate change. Between 2009 and 2010, InsightShare held workshops in four of the eight participating countries: Malawi, South Africa, Kenya and Zimbabwe. Insight Share passed on skills in participatory video and monitoring and evaluation to build the capacities of community members and staff from the community based organisations (CBOs) and nongovernmental organisations (NGOs) implementing CBAA in each country. This enhanced the partners capacity to listen to the community members in their search for local adaptation strategies, and to monitor their pilot projects and climate related indicators. CBAA decided to use participatory video and M&E as a means to enable the communities to record the impacts and the local adaptation knowledge in their own words. In addition to amplifying voices of the community, the activity also aimed to enhance accountability, support action research, strengthen communication between the NGOs and the communities, and help generate and archive local knowledge. Badjeck, 2009, opined that the resilience of fisheries system depends on the ability of institutions to build and adopt knowledge in order to self-organize and transform in the face of climate variability and change. Lebel et al. hypothesize that the ability to detect thresholds in a timely manner, and the capacity to build knowledge about ecological processes into institutions should improve the fit between rules and ecosystems, and allow societies to take measures to prevent ecosystems from crossing thresholds. Knowledge building and institutional learning are essential facets of good governance and necessary for; institutions to design adaptive management strategies. Adaptive management deals with the unpredictable interactions between people and ecosystems, emphasizing the importance of feedbacks from the environment in shaping policy and of the ability to learn, experiment and be flexible. Coping more effectively with climate change and variability requires governance systems and policies that not only foster flexibility but consider it as a management goal, part of an adaptive management strategy, and instrumental to responses to climate change. In the Philippines, an SMS-based system of two-way data exchange has been implemented using basic mobile phones⁴³. Information seekers – e.g. a farmer, extension worker, agribusiness owner, or others – can send a text message to the Philippine Rice Research Institute's Farmers' Text Centre to get free guidance on rice growing. This system can provide timely information useful to minimise impacts of climate change on rice farming ranging from short-term advice on planting and harvesting in relation to extreme weather events, to medium-term guidance on planting techniques to reduce methane production or to cope with fluctuations in seasonality, to information on coping with longer-term changes to pest and crop suitability. A similar initiative in Uganda, called The Farmer's Friend service, responds to text message queries on everything from weather forecasts to pests to planting techniques.

National status:

The Fisher Friend Programme of the MS Swaminathan Research Foundation (MSSRF) processes satellite information in order to provide weather forecast and fishing zone information in local languages via mobile phone 40. Alongside the financial gains of improved fish stock location, this system can also have climate-related benefits: it has successfully forecast storms and other extreme weather events that have led fishermen to avoid particular areas or simply not put to sea. In addition, with climate change associated with changes in sea currents, the fish shoal availability information is seen as an integral part of building longer-term adaptive capacity. Future plans include making the information available via IVR to enable hands-free and low-literacy user access, and adding global positioning system capability into the phones, to enable tracking in the event of a local weather-related disaster

Methodologies: A combination of methodologies consisting of case studies, key informant interviews, focused group interactions, content analysis, questionnaire surveys, knowledge tests, attitude scaling, PRA (Participatory Rural Appraisal), participatory scripting, online testing, scenario building and soft knowledge documentation can be used to achieve the objectives. A situation analysis of the cognitive dimensions of risk perception as well as characterisation of epistemological traditions/trajectories in knowledge construction related to climate change and ecosystem management will define the communicative outcomes before they are subjected to empirical cross country validation, upscaling and mainstreaming. The designing and validation of communication tools and strategies can be done on a participatory action research mode in selected locations across the various sectors in the country.

The research design should be kept flexible and open so as not to miss the emergent issues, tackles and opportunities. All the onboard and field level deliberations, discourses and interventions will be captured using sophisticated audio and video equipments. They will be analysed using mutually agreeable epistemological protocols. The mainstreaming of web based communication platforms and incorporation of the major lessons into pedagogic strategies is attempted as an exit strategy to ensure post-project sustainability of the outcomes.

There is an element of meta-communication ingrained in the research design as the project is deemed to be a very innovative inter-continental attempt that has the potential to deliver cues on new forms of epistemological coalitions considered as essential in addressing collective action dilemmas like climate change. This is achieved by the process documentation of the whole project as well as analysing the built-up base of experiential knowledge. SWOT analysis, constraint analysis which are also included as vital tools of enquiry.

Anticipated Process/Products/Technology/Knowledge Expected to be evolved

✓ Well-validated, contextualised array of climate change communication tools and strategies which include animation films, interactive CDs, short documentaries, training manuals, posters,

campaign materials, web based platforms, radio talks, feature stories, news stories, street plays, traditional /folk media formats, community wallpapers, and simulation games.

- ✓ The animation films and documentaries will be periodically telecast through local television channels and feedback studies will be conducted regularly.
- ✓ Knowledge on the climate change information needs, communication barriers, cognitive drivers, level of awareness, risk perception, and management needs as perceived by the stakeholders in both countries.
- ✓ Documentation of indigenous ecological knowledge validated with received scientific knowledge base.
- ✓ Process documents, both audio and video, that capture multidisciplinary epistemological insights and key learnings.
- ✓ Shared experiential knowledge by the team members
- ✓ Strategies for reinventing a climate change extension system for responsible fisheries management
- ✓ Pedagogic strategies for climate change fisheries education.
- ✓ Institutionalised research designs and knowledge exchange /upgrading between scientists of the two countries.
- ✓ Research articles, thematic discussion papers, dossiers and reports.
- ✓ An informed constituency of stakeholders in both countries

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