Risk Communication Guide for Climate Change Practitioners in Africa

AfricaAdapt| Stockholm Environment Institute

Introduction

This guide provides you with an overview of the key concepts you'll need to understand about communicating climate risk. Throughout the guide the main ideas and lessons learned on risk communication are outlined, and examples are used to illustrate ways in which risk communication strategies have been used to support climate adaptation activities in Africa.

Much of this guide draws on experiences from the ACCCA programme, and a set of articles written by Anna Taylor, Tahia Devisscher, Fernanda Zermoglio and Jon Padgham[1]. A guidance document written by SEI and ENDA in 2009[2] also provided particularly useful background material.

What is Risk Communication?

Risk communication, in a climate change context, can be thought of as a process of exchanging and sharing information about climate-related risks between various information providers and decision-makers. This might include including local authorities, community groups, researchers, managers, practitioners, members of the public, media, and other interested parties.

Climate risk communication may include information on a wide range of climate risks and their potential impacts. Information could refer to physical changes in climate, for example how rainfall patterns are changing or expected changes to floods and droughts, the impact of such changes, for example on water availability or crop production, and the extent to which different groups might be impacted in different ways by these changes.

There is no 'right' communication strategy which can be applied universally. Rather, risk communication must be tailored to meet the needs of the audience being targeted. What is an appropriate way to communicate about climate change to a local government official is unlikely to be a good way to communicate with local community groups.

Why Communicate about Climate Risks?

The simple answer to this question is so that people who may be affected by climate risks have the information they need in order to make informed choices to reduce their risk; in other

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[1] Freely available online at http://weadapt.org/knowledge-base/social-learning/risk-communication-in-the-context-of-climate-change

[2] Devisscher, T. and Taylor, A. (2009). *Guidance on Climate Risk Communication*. Produced by SEI for ENDA Tiers Monde under the project C3D+ "Capacity Development for Adaptation to Climate Change and GHG Mitigation in Non-Annex 1 Parties to the UNFCCC".

words so that they are able to adapt to climate change in a planned way rather than simply reacting to changes as they occur.

The fundamental goal is to convey information and assist learning about the risks posed by climate change so that informed and proactive decisions about how to adapt can be made. In order to make good adaptation choices we need to be knowledgeable about climate change in the local context. Risk communication is important as a way of building the knowledge needed to make these decisions.

The Process of Risk Communication

Communication can take many different forms including: speaking-listening; writing-reading; drawing; acting; story-telling; singing; gesturing; imaging (e.g. map, photograph, diagram). Based on this there are multiple mediums through which communication can be conducted including: conversation; deliberative dialogue; radio; TV; internet; newspaper; video; book; exhibition; play; magazine; lecture; presentation; game; billboard poster; etc.

Recording for the Bravos do Zambese radio programme. Photo source: http://www.cmfd.org/cmfdpubs/DRR_FinalReport_CMFD0210.pdf

More detailed examples of different approaches to risk communication are provided in the sub-theme covering examples of risk communication strategies, and the advantages and

disadvantages of some of these approaches are outlined in the Tools and Approaches sub-theme.

To select the most appropriate communication method one needs to consider the following:

- What is the purpose of your message?
- Who are the key people to communicate this with?
- What facts must be presented to achieve your desired effect?
- What are the audience's current attitudes toward the issue?
- What are the preferred communication styles of the audience (e.g. formal vs. informal, written vs. verbal)?
- Are you sufficiently familiar with the subject matter that pertains to the message?
- Are there constraints that affect the selection of the method e.g. time availability; necessary skills; logistical arrangements; access to the medium; shared language; literacy; existing knowledge of the subject; cultural sensitivity etc.?
- Are there visuals that will convey the message better than words, or that will support words to strengthen the impact of the message, making it more engaging, easily interpretable, and memorable?

It's very easy for a message to get lost or misunderstood when communicating. There are a few basic principles to consider when communicating which can reduce the chance of a misunderstanding:

- Know your audience (interests, opinions, knowledge of the topic, etc.)
- Know your purpose
- Know your topic
- Select a suitable environment in, or forum through, which to engage in the communication
- Anticipate objections
- Present a rounded picture (do not overstate the case)
- Achieve credibility with your audience
- Follow through on what you say
- Communicate a little at a time
- Present information in several ways
- Develop a practical, useful way of getting feedback

- Use multiple communication techniques (that will appeal to different people's styles of acquiring information)

It is also very important to get the choice of communicator right - this can influence whether or not the message is well or badly received. Studies from psychology show that people respond in very different ways to the same message delivered by different communicators. So if the audience is policy-makers, then a professional with a government background might be most likely to get the message across, whereas if the audience is a local community group then a respected community member would be a better choice.

Evaluating the effectiveness risk communication is crucial if we are to improve them and make learn from the process and improve the strategy for the next time round. This is explored further in the evaluation sub-theme.

Developing your message

As mentioned before, messages must be appropriate for the audience you're trying to reach, and should be adjusted according to the background, attitudes, knowledge and culture of the stakeholders we wish to influence with the message. The message also needs to be clear and understandable given the technical (or not!) background of the audience.

It is useful and important to make clear the difference between current risks, and risks which might be experienced in the future. Current risks are easier to characterise but it is more difficult to assess the pathways through which these risks might change into the future, and to include associated measures of uncertainty and confidence in our communications.

Clearly, at a local level, there is a great deal of understanding about the local environment, and frequently people identify that changes have occurred and current climatic conditions are not the same as they used to be (for example we often here that the beginning of the rains is less predictable than it before). When engaged in a risk communication strategy therefore it is important to understand this local knowledge and try to place it within the longer term context of future changes to climate risks.

Based on experience in the field working in different contexts and with different approaches to risk communication, there are several important lessons which emerge as key parts of successful risk communication strategies. These are briefly described below and are expanded on in the Core Components of Risk Communication section:

Two-way dialogue: participatory processes help to create communication strategies which are more relevant to the audience, and therefore likely to be more effective.

Understand the local context and knowledge: It is crucial to understand local perceptions of climate risks and baseline understanding of local climate and variability. An understanding of local cultural and social norms is needed to be able to communicate in a trusted way.

Engagement in the process: Engagement in the process of developing risk communication strategies empowers the participants through knowledge generation and sharing, resulting in higher understanding of and sense of commitment to the message that is being communicated.

Different strategies for different audiences: Different tools are needed to communicate to a wide range of stakeholders, who may have very different levels of understanding and technical background, different ways of interpreting information and different needs.

Innovative and creative approaches: Practical and creative approaches to risk communication allow a wider range of stakeholders to be engaged, and can be more effective ways of communicating the complexity and uncertainties of climate change.

Use the local language: Communicating where possible in the local language will be much more effective than in a second language.

Sub-Themes

The sub-themes in this guide will cover the following important aspects related to climate risk communication: Tools and Approaches for Climate Risk Communication, Core Components of Risk Communication, Case Studies of Risk Communication Strategies and Evaluating Risk Communication.

Tools, Methods and Approaches for Climate Risk Communication

As mentioned above, risk communication strategies need to be appropriate for the intended audience of the message. There is wide range of approaches which can be used, from policy briefs and formal presentations, to community theatre and participatory video.

In general, narrative and engaging processes tend to be more effective in communicating with local communities than complex numerical presentations which rely on a high level of existing scientific understanding. However, concept notes, briefings, slides presentations, and brochures can serve to communicate clear and relevant messages to local- and national-level

policy makers at workshops and/or formal events. The use of examples and analogies, making reference to familiar local situations, and illustrations or graphical approaches has also been shown to be useful communication tools.

Advantages and disadvantages of some tools and methods to communicate risk

The table below summarises the advantages and disadvantages of different strategies which have been used for risk communication. These have been developed based on experiences from the ACCCA programme, which was funded by UNITAR.

Tools	Country	Scale of target audience	Advantages	Disadvantages
Brochures/ bulletins	Mongolia, Burkina Faso, Bangladesh Philippines, Nigeria, Mali	Local and national stakeholders	Easy dissemination Short text only with key messages	Relevant only to literate
Poster	India	Local stakeholders	Easy dissemination and can reach a wide audience if distributed in strategic public spaces	Interpretation requires additional interaction between providers and users of information
Magazine	Philippines	Local and national stakeholders	Didactic, diverse, attractive to read	Costly to publish, limited number of samples
Policy briefs	Mongolia, Kenya	National stakeholders	Short, direct to the point and easy to read	Challenge in simplifying message without losing meaning
Formal powerpoint	Mongolia, Mali	National stakeholders	Can be dynamic and interactive if	It can be impersonal and not inclusive,

			it engages the audience in further discussion and reflection	and generate indifference
presentations				
Peer reviewed articles	Kenya, Malawi, Philippines	National and international stakeholders	High credibility	Time consuming. Proficient level of literacy and good understanding of the subject required
Role-play, drama and music	Mali, India	Local stakeholder	Entertaining and can reach and engage a wide audience (including illiterate)	Requires time and preparation to participate as both cast and audience
Group discussions	Mongolia, Nepal, Bangladesh Philippines, Ghana, Tanzania	Local stakeholders	Inclusive, participatory	Requires time and willingness to participate in the discussion
Training of trainers	Ghana, Kenya	Local stakeholders	Inclusive, learning by doing (hands-on exercises), creates sense of empowerment and responsibility (commitment)	Requires time. Difficult to select the leaders to be trained. Leaders need to have credibility and show commitment to continue with the process
Videos	Malawi, Philippines, Mongolia, Kenya	Local and national stakeholders	Can reach a wide audience (including illiterate). Can engage stakeholders in the process (if participatory video-making)	High production costs. Requires time and preparation. Technical expertise is needed. Need of electrical power for editing. Requires time for editing the raw material with

				participating villagers
TV and radio broadcasts	Philippines, India, Mongolia, Ghana	Local and national stakeholders	Wide reach and entertaining	Broad message can lose local relevance

Core Components of Risk Communication.

This section is taken from a report on risk communication written for the ACCCA programme by Anna Taylor, Tahia Devisscher, Fernanda Zermoglio and Jon Padgham. The full report is freely available online at http://weadapt.org/knowledge-base/social-learning/risk-communication-in-the-context-of-climate-change.

Based on experiences in the ACCCA programme and elsewhere, the following elements have been shown to be important parts of ensuring effective risk communication:

Two-way dialogue

Risk communication tools, methods, and guidance materials, have to evolve through a two-way participatory dialogue between the communicators (e.g. scientists, trainers, project implementers, government agencies, etc.) and the receivers (e.g. community members, household heads, school children, groups at risk, government regulators, etc.). Workshops and learning sessions are key elements of this two-way dialogue that encourages learning and exchange of knowledge. This process of social learning will promote the development of strategies that are relevant (in the context of the receiver) and effective.

Knowing the local context

In order to effectively communicate climate risk, it is important to know first the local context and local perceptions on climate risk (of both exposure groups and decision-makers). To develop risk communication strategies that will be embraced by the receivers (e.g. vulnerable groups, government regulators), these strategies have to be reflective of the social and cultural norms under which the receivers operate. The strategies need also to consider the other risks (non-climate risks) faced by the exposure/vulnerable groups and how these risk inform decision-making.

Understanding the local know-how on climate risk

Relevant risk communication strategies need to be informed by assessments that determine the baseline status of stakeholder knowledge on climate risk. It is critical to understand the local perceptions on climate risk, the sources of knowledge within the communities, and the strengths and gaps of knowledge on climate variability and change, and the risks to the exposure groups. Knowledge assessment at community level can be conducted through household surveys and participatory group discussions. Knowledge assessment of policy makers can be conducted through individual meetings, interviews and formal workshops.

Experience on the ground has demonstrated that, in general, local knowledge of current climate risks is substantial, and the perception of local changes in weather patterns (climate variability) is evident. However, there is no substantive local understanding of climate change as a global and enduring phenomenon, or of the risks associated to long-term climate change to local livelihoods. Having a better understanding of the existing stakeholder knowledge provides the basis to develop relevant risk communication strategies that can inform knowledge gaps and fulfil knowledge needs. In addition, the relevance of the information shared can be enhanced, building stakeholder capacity in multiple and reinforcing ways through in-depth learning about risks and vulnerability, training on assessment methods, surveys, and participatory risk communication activities.

Engagement in the process

Building effective risk communication strategies requires developing capacities and knowledge, and promoting partnerships between the different stakeholders involved in the process. To facilitate this, it is key to engage stakeholders (e.g. vulnerable communities, resource managers, scientists, private sector, government policy makers) early in the process and continue building partnership and engagement throughout implementation. Engagement in the process of developing risk communication strategies empowers the participants through knowledge generation and sharing, resulting in higher understanding of and sense of commitment to the message that is being communicated. Sense of stakeholder ownership over the learning process also engenders capacity for action.

Engagement in the process can be promoted through the participatory development, validation and testing of the methods, tools and materials for risk communication. Engagement can also be achieved through training of trainers. The approach of training trainers is meant to have a cascading effect on information dissemination where trained stakeholders are involved in the

process of disseminating the message further to reach wider audiences. The process of selecting trainers among the stakeholders is critical for the effectiveness of this approach; a key consideration is to identify stakeholders perceived as having credibility within the stakeholder communities.

Combining strategies to target different stakeholders

To cater for a wide range of stakeholders, different tools and methods to communicate climate risk need to be developed and combined. Given that stakeholders can have different levels of expertise and backgrounds (disciplines), needs and expectations, a diverse range of materials that accommodate these differences have to be used for effective communication. At the local level, interactive communication strategies such as theatre, role-play, music and group discussions where community members are involved in debating climate risks and possible solutions to cope with climate change have been demonstrated to have a positive effect on communities' behaviour and practices. Reports, concept notes, brochures, magazines, and formal presentations and workshops have proven to be effective communication strategies with policy makers at the local and national levels. To create widespread awareness at country/regional level, broad dissemination channels such as TV and radio broadcasts have shown to be useful.

Strategic use of space

To reach a wide audience, it is important to consider the strategic use of public space. If the communication strategy is to disseminate key information on climate risk, the distribution of large posters and brochures in public spaces such as schools, governmental buildings and markets have proven to be helpful. If the strategy is to train stakeholders, schools and universities provide the suitable environment to enhance learning and knowledge sharing. Governmental buildings have demonstrated to be useful for formal workshops with policy makers, while spaces where communities usually gather are appropriate for folk theatres, interactive role-plays and group discussions.

Innovative ways of communicating

Innovative processes of interactive learning have proven to be successful strategies for effective communication. Learning-by-doing, using practical and creative approaches, offers opportunities to better understand and use climate information despite the complexities associated to uncertainties, multiple and dynamic vulnerabilities, numerical analysis, etc.

Hands-on exercises also help to understand the value of applying this information for decision-making. Innovative ways of communicating risk should consider interaction and two-way dialogue, as well as learning-by-doing, creativity and openness to varied understanding of meanings and respect to diverse backgrounds and disciplines.

Local language

Communicating where possible in the local language will be much more effective than in a second language. This may pose problems in relation to terminology, but remains more effective where possible.

Case Studies of Risk Communication

This section gives three examples of different risk communication strategies which have been used to develop adaptation options in different projects. The first two projects are from the ACCCA programme and explore audio-visual approaches to communication. The third project explores the use of radio in Mozambique to communicate on climate adaptation and disaster risk reduction.

Country: Mali

Project Title: Climate Change Adaptation from the Bottom Up - Collaboration Between Malian Communities and Scientific Organizations to Identify and Implement Responsive Water Management Actions

Climate risk: water scarcity, droughts
Adaptation decision: water management

The project explores the links between vulnerability and adaptation to the effects of climatic change in the basins of the Sankarani and Baoulà rivers. The main purpose of the project is to help the members of three pilot communities in southern Mali to identify and implement promising water management innovations that could improve household conditions by increasing resilience to climate change.

During a field visit conducted by the technical support team to the Mali pilot action in April 2008, a communication strategy was developed to translate scientific information into a format that is simple to understand and accessible to members of the project target communities (Diouna, Kiban, and Massabla). Several communication channels were explored. Finally, the

project team decided to use audiovisuals, theatre and music as means to communicate climate risk to communities.

Folk Theatre in Massabla

The awareness raising musical involved collaboration between the students and director of the National College of Arts and the Hamala Labo SEP group, which has expertise in awareness raising activities using music and theatre. Both teams worked together to develop an awareness raising campaign using local language, music and dance. The communication strategy expressed the communities' concerns, and raised awareness on the potential impacts of climate change in the region.

In addition to the musical, a video showing proposed adaptation options was developed, and presented to the communities and national policy makers to encourage discussion on trade-offs. Adaptation options included improvement of irrigation systems and access to drinking water, installation of solar pumps to provide access to potable water, and construction of a small dam on the Mono River. The communication materials of the project were prepared in the local and the national languages, and presented to the scientific advisors at Poznan, COP 14, in December 2008.

Country: Malawi

Project Title: Audiovisual Tools for Community-based Adaptation - Bridging the Malawi Red Cross and Meteorological Services

Climate risk: dry spells, seasonal droughts, intense rainfall, river floods and flash floods.
Adaptation decision: water management, agricultural practices to ensure food security and sustainable livelihoods of rural communities.

The main objective of this project is to use audio-visual communications to contribute to community-based climate change adaptation in two ways: helping in the transfer of local adaptation experiences and knowledge between vulnerable communities, and contributing to bridge gaps between the scientific community and the community of practice.

Farmer filmmakers

The main idea of the project was to involve villagers and Red Cross volunteers of the Malawi Red Cross Society (MRCS) in the production of a participatory video including local perspectives, language and approaches to communicate climate related risks in five villages of the study area.

To do this, three main activities were undertaken: 1) training of local people in producing a film, 2) screening this film in other villages, and 3) evaluating the effect of the film (participants answered a questionnaire before and after the screening to distinguish what they learnt from the video; a group of villagers were also interviewed on camera). These activities were carried out in five rural villages in the district of Salima in Malawi: Mphunga, Kasache, Pemba, Mwanza and Maganga.

The project started with training on climate change and risks executed by MetMalawi's senior meteorologist office, with participation of the MRCS disaster management officer and support from the RC / RC Climate Centre's technical adviser. Then, selected individuals from MRCS headquarters and the pilot district received intense training to enable them support the design of audiovisual tools. In July 2008, adaptation strategies were selected during participatory processes at the community level and consultations with agriculture and disaster management experts from Red Cross, MetMalawi and other institutions. Mphunga villagers (later named the filmmaker farmers) were requested to identify what they had being doing differently as a result of their understanding of climate change after receiving the training. They came up with a list of six adaptation messages that were turned into a short film to go on a 'screening tour' around the four other villages. These villages were on average 40 km apart and their members had no contact with each other.

The full video for this project can be watched at http://weadapt.org/placemarks/maps/view/808. Evaluation of the project is also described in the Evaluating the Effectiveness of Risk Communication section.

Country: Mozambique
Project Title: Bravos Do Zambese, Disaster Risk Reduction Radio.

Bravos do Zambese ('Zambezi Braves') is a multi-faceted initiative that combines a high quality 26-episode radio drama with training for community radio journalists, in order to convey information around disaster risk reduction and build local capacity for reporting on disasters and climate change adaptation.

The two-season drama is designed to communicate information around natural disasters and strategies to reduce the devastating consequences they can have on local communities. Season One deals with the immediate aftermath of flooding, issues around displacement, what can happen if people are not prepared, and the importance of sticking together as a community.
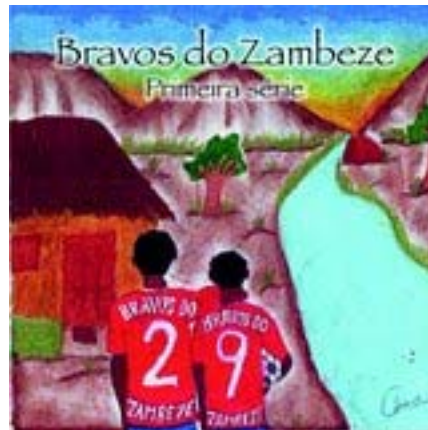
Season two of Bravos deals mainly with the process of rebuilding, as well as the importance of adapting to the reality of increasingly frequent and severe weather patterns. The aim in this season is to communicate specific, useful information about longer-term disaster management and planning, including farming and building techniques that are more disaster-resistant, and preparing an evacuation plan for future emergencies.

The drama was created based on research with communities who had been displaced as a result of flooding.

Feedback from a focus group discussion conducted on the drama, as well as evaluations from actors provides a positive indication that this drama will help people affected by floods cope with their situation and bring about change. Further details on the evaluation of this project are provided in the Evaluation section.

More details on the project can be found on AfricaAdapt: http://www.africa-adapt.net/projects/130/

Evaluating the effectiveness of Risk Communication

A measure of the effectiveness of a risk communication message is how well the intended message and the message understood by the audience match up.

Evaluating the effectiveness risk communication is crucial if we are to improve them and make learn from the process and improve the strategy for the next time round. Unfortunately there are few methodologies that have been developed which can be used across the board to evaluate risk communication. It may be useful to look at aspects such as whether the behaviour of the target audience has change, whether they feel better informed and able to act upon climate risks and the numbers of people the message reached. It is important not to simply

focus on the numbers of people the message reached alone, however, as they may have heard but not understood the content or importance of the message.

Some possible methods for use to evaluate risk communication include interviews, focus groups or observation of behaviour. Two examples of ways in which risk communication strategies have been evaluated are given below, from Malawi and Mozambique.

ACCCA project: Participatory video in Malawi (for full details of the project see here).

To evaluate the participatory video method used, questionnaires were distributed before showing the film. Participants had to answer 15 questions mainly about if and how they were experiencing climate change and how open/willing they were to adapt their livelihoods. After watching the film they had to answer a post-film questionnaire. With the questionnaires the knowledge before and after the screening was compared. For a qualitative and more emotional capture of the impressions, four participants in each village were interviewed and filmed. The outcomes show that most of the adaptation messages were picked up by 80 to 90% of the audience-farmers. This demonstrates that a film produced by villagers using a participatory approach is an effective way of transmitting important messages on climate risk and supporting community-based climate change adaptation.

Community Media for Development project: Bravos do Zambese radio drama, Mozambique.

The Bravos do Zambese project used radio drama to inform about climate adaptation and disaster risk reduction.

Feedback from a focus group discussion conducted on the drama, as well as evaluations from actors provides a positive indication that this drama will help people affected by floods cope with their situation and bring about change. One focus group participant said that "people who hear the drama will learn something, and will know how to help those who are in danger." Another said that "I [learned that] every time there is an emergency situation, we shouldn't wait around until it gets worse." Moreover, both focus group participants and actors felt they could identify with the characters, even relating several of the characters to people they knew who had gone through similar situations. One woman noted that "the old man Domingos, he reminded me of my Dad who also suffered in a flood situation. He didn't want to listen in the beginning."

After the airing of season one, CMFD conducted telephonic surveys with radio stations that received the drama. Presenters said that the drama is "entertaining and informative", "just

what we need", and "what the people need." Most stations conducted additional activities around the drama, including hosting call-in shows and inviting studio guests. Presenters also found the discussion guide included with the drama useful, clear, and made it easier for them to talk about the drama and the issues. All presenters noted that their knowledge of natural disasters and disaster preparedness has increased "a lot"; most expressed that their coverage of natural disaster issues has changed because of this increased knowledge.

Resources on Risk Communication

Much of the content for this resource guide has been adapted from a set of articles on weADAPT which were written based on experiences with risk communication in the ACCCA programme. The tables below provide a set of useful resources to expand on what has been written in this guide, as well as a set of practical case study examples of risk communication.

The SEI and ENDA document '*Guidance on Climate Risk Communication*' is also a very useful starting point for further information on risk communication. The full reference is: Devisscher, T. and Taylor, A. (2009). *Guidance on Climate Risk Communication*. Produced by SEI for ENDA Tiers Monde under the project C3D+ "Capacity Development for Adaptation to Climate Change and GHG Mitigation in Non-Annex 1 Parties to the UNFCCC". The document is available on demand.

Useful Resources

Resource	Link	Description
weADAPT	www.weadapt.org	Articles describing the process of risk communication, with case studies from the ACCCA programme, as well as short training modules and exercises. Search for 'Risk Communication'
Climate Access	http://www.climateaccess.org/resource/collection/risk-communication-resources	Collection of useful materials on Risk Communication and Climate Change
Communicating	www.metcalfinstitute.org/resources/communicating-	Free book on how to

on Climate Change	on-climate-change/	communicate about climate change.
Climate Airwaves	http://ijoc.org/ojs/index.php/ijoc/article/view/1364/673	Article summarising lessons learned from community radio in Ghana
Communicating statistics and Risk	http://www.scidev.net/en/practical-guides/communicating-statistics-and-risk.html	SciDev Guide to communicating risk and statistics
World Resources Report	http://www.worldresourcesreport.org	Search for 'participatory' for a useful article about using participatory games for communication

Examples

Case Study	Link
Communication for sustainable development - CSDI	http://www.africa-adapt.net/projects/173/
Communicating Adaptation in Johannesburg	http://www.africa-adapt.net/projects/93/
Bravos do Zambeze, Disaster Risk Reduction Radio	http://www.africa-adapt.net/projects/130/
Sharing community knowledge of climate change using multimedia approaches	http://www.africa-adapt.net/projects/169/

Examples from the ACCCA programme	http://weadapt.org/knowledge-base/social-learning/accca-experiences-examples-of-risk-communication-strategies
ICTs and Climate Change	http://www.africa-adapt.net/themes/11/resources/159/theme/
Radio dramas to build the capacity of smallholder farmers to adapt to climate change	http://www.africa-adapt.net/projects/144/