



Decision-making for climate resilient livelihoods and risk reduction:
A Participatory Scenario Planning approach

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CLIMATE CHANGE AND THE NEED FOR ADAPTATION

Changes in rainfall amounts and seasonal patterns are already being experienced in many parts of the world, including Sub-Saharan Africa, creating problems for vulnerable farmers and other land users in securing their livelihoods, and increasing the risks they face. The frequency and intensity of extreme climatic events such as heat waves and erratic heavy rainfallⁱ, as well as the long term chronic effects of higher temperatures are set to increase. The effects of these climatic changes will become even more pronounced in the futureⁱⁱ, particularly in Sub-Saharan Africa where livelihoods and ecosystems are highly sensitive to changes in climate. For this reason, effective strategies and plans for adaptation to both climate change and climate variability are of central importance to countries, to ensure that continued development in vulnerable areas is resilient to the impacts of climate change.

Effective adaptation to climate variability and climate change is dependent on access to climate information for the coming seasons and years, to enable communities make decisions for now and the future. Flexible planning in the face of a continuously changing climate – a key element of adaptive capacityⁱⁱⁱ – needs to be informed by climate forecasts and the effects of uncertainties and risks^{iv} on different vulnerable groups and socio-economic sectors, so as to identify a range of response options. Scenario development of how livelihoods and sectors would be affected by probable climate futures contributes to making livelihoods more climate-resilient, and can be a first step towards mitigating the effects of climate related disasters on communities.

The Adaptation Learning Programme (ALP), implemented in Africa by CARE International, is supporting communities and local governments to use seasonal climate forecasts and information on climatic uncertainty for decision making, as part of the community-based adaptation (CBA) approach.

KEY MESSAGES

- Effective **adaptation decision making** is informed by past, present and future climate information, enabling plans and actions for **climate-resilient livelihoods and disaster risk reduction**.
- **A multi-stakeholder platform** enables sharing, understanding, interpreting and communicating climate information, by giving space for dialogue on local adaptation issues and options. Synergising across stakeholders is essential for responding to the challenge of unknown futures.
- Combining **local and scientific knowledge** systems is important for making climate information relevant locally and for empowering communities.
- **Local adaptive capacity** is enhanced by including communication and use of climate information in adaptation planning processes, enabling communities to live with the uncertainty and risks that climate change presents.

WHAT IS PARTICIPATORY SCENARIO PLANNING?

Participatory Scenario Planning (PSP), as used by ALP, is a mechanism for collective sharing and interpretation of climate forecasts. PSP is conducted as soon as a seasonal climate forecast is available from meteorological services, meaning it occurs as many times in the year as there are rainy seasons in that particular area.

In a workshop setting over one to two days, PSP brings together meteorologists, community members, local government departments and local NGOs to share their knowledge on climate forecasts. The workshop creates space for sharing climate information from both local and scientific knowledge, discussing and appreciating the value of the two sources and finding ways to interpret the information into a form that is locally relevant and useful.

This is achieved by participants considering climatic probabilities (which are an expression of the uncertainty in the climate forecast), assessing their likely hazards, risks, opportunities and impacts, and developing scenarios based on the assessment. Discussion of the potential implications of these scenarios on livelihoods leads to agreement on plans and contingencies that respond adequately to the levels of risk and uncertainty. Participatory Scenario Planning forms part of the adaptation planning process, making the link between community plans and local government response, support and higher level plans.

BOX 1: CLIMATE INFORMATION AND KNOWLEDGE

Climate information includes observations, data and analyses (past time period) as well as forecasts (future time period) of the average characteristics of weather in a particular area. It is generated through people's own observations, by meteorological services, some large livestock ranches and agricultural enterprises such as tea and coffee farms, agricultural research stations, schools and colleges. Information should be available at the time when it is needed, in a language, format and process which enables it to be easily understood.

Climate knowledge is gained when climate information is accessed from a range of sources and is contextualized, analysed, translated for practical use and applied in different situations.

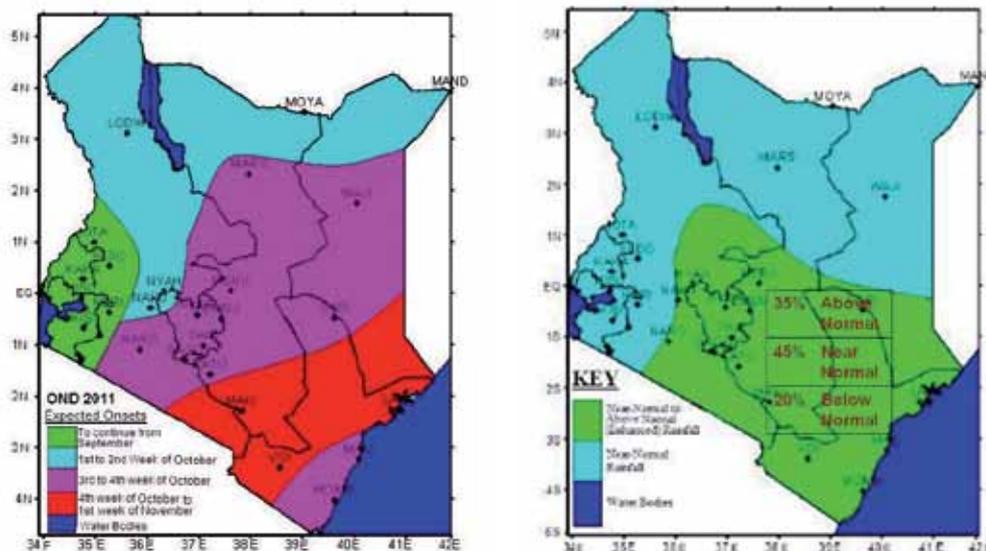


Figure 1: An example of a seasonal forecast produced by the Kenya Meteorological Department for the October to December 2011 rainfall season. During the PSP in March 2012, what actually happened in the October to December 2011 rainfall season was reviewed. Community members reported that normal to good rainfall amounts had been received in the different areas where ALP works, and that the rainfall began during the dates that were presented in the forecast. Hence, there was good agreement between the forecast and rainfall performance in the season. This simple validation process helps to build confidence in using climate information.

OBJECTIVES OF PARTICIPATORY SCENARIO PLANNING

1. Facilitate access to and shared interpretation of climate forecasts to generate information which can be understood and used, taking risk and uncertainty into account;
2. Assist communities and local governments to agree on options, make decisions, develop and plan for climate-resilient livelihoods (by knowing forecasts and probabilities so as to spread and manage climatic risk);
3. Promote the integration of climate-resilient livelihoods and disaster risk management into local government planning processes;
4. Create a common platform for climate communication which respects, reviews and combines knowledge from communities and different groups within them, meteorological services and service providers;
5. Link government and community actors to enable response and support to community action plans and empower communities through improved contacts and relations.

ALP has facilitated PSP workshops using seasonal climate forecasts, helping communities in Kenya and Ghana to adapt to seasonal climate variability. This is in recognition that changes in seasonal climate patterns are occurring within long term climate change and adaptation needs to address both the short term and long term changes. ALP plans to develop similar fora using projections of climate change over 10, 15, 20 years to inform long term scenarios and plans for adapting to climate change, building on ongoing scenario planning in programmes such as the Climate Change Agriculture and Food Security (CCAFS) Programme^v.

THE PSP PROCESS: KEY STEPS WHEN CONDUCTING PARTICIPATORY SCENARIO PLANNING

1. Identify the **meteorological services and forecasts** available for the location where adaptation is being planned and plan the PSP workshop with them and key local actors, following good practice principles (See Box 2).
2. Invite participants from a **relevant range of stakeholders**, including meteorological services and local/traditional forecasting experts.
3. **Exchange** seasonal climate forecast from local and scientific sources.
4. **Discuss and integrate** the forecasts from the two sources.
5. Participants **interpret** the seasonal forecast into three probabilistic **hazard scenarios, assessing risks** posed by the hazards to develop **impact scenarios. Opportunities** in the coming season are also identified for each scenario.
6. **Participants discuss the local implications** of the impact scenarios considering the status of food security, natural resources, livelihoods and sectors.
7. **Participants discuss and develop actions** for each impact scenario, **taking advantage of identified opportunities:** What will communities, local government and local NGOs do? How will their actions be mutually supportive and respond to both the current situation and the expected forecast in relation to livelihood and sector priorities?

BOX 2: PRINCIPLES GUIDING EFFECTIVE PARTICIPATORY SCENARIO PLANNING FOR CLIMATE COMMUNICATION

- Involve all relevant stakeholders, women and men of different age, livelihood, ethnic or other groups, recognizing their roles and utilizing their specific knowledge and capacities to enable a participatory process and coordinated outcomes.
- Recognize, respect and build on both local and scientific climate knowledge.
- Encourage open discussion, dialogue and feedback among stakeholders. Use a range of participatory workshop methods to ensure discussion and reflection are open and useful to all. Pay attention to language used to ensure everyone understands and can contribute.
- Communication should be inclusive, reaching all genders and groups (e.g. livelihood groups, land users, vulnerable groups) within the community.
- Conduct timely PSP, as soon as possible after the seasonal forecast is available, and timely communication of advisories to empower communities, local governments and other adaptation practitioners to take appropriate actions.
- Encourage participants to take their own decisions and actions as well as to support others and seek necessary support. Be ready with ideas on where this could be found.

8. **Develop advisories** from the actions discussed: Locally-relevant and actionable information, with agreed responsibilities among local actors.
9. **Communicate advisories** to users e.g. through radio, local monitoring or other institutional systems, religious leaders, chiefs, government departments, local groups, NGOs, media etc.



PSP Outputs: By the end of the PSP workshop, participants have produced plans for three different scenarios of hazards and impacts and a set of advisories for the coming season. Examples are given in Figure 2 and 3 and Table 1.

Figure 2: An example of hazard scenarios based on seasonal climatic probabilities, which were developed during a PSP workshop in Bolgatanga, Ghana in March 2012.

Figure 3: Illustrates how participants at the PSP collectively interpret seasonal climate forecasts into locally relevant information (advisories) that is useful for making decisions on climate-resilient livelihoods and Disaster Risk Reduction (DRR).

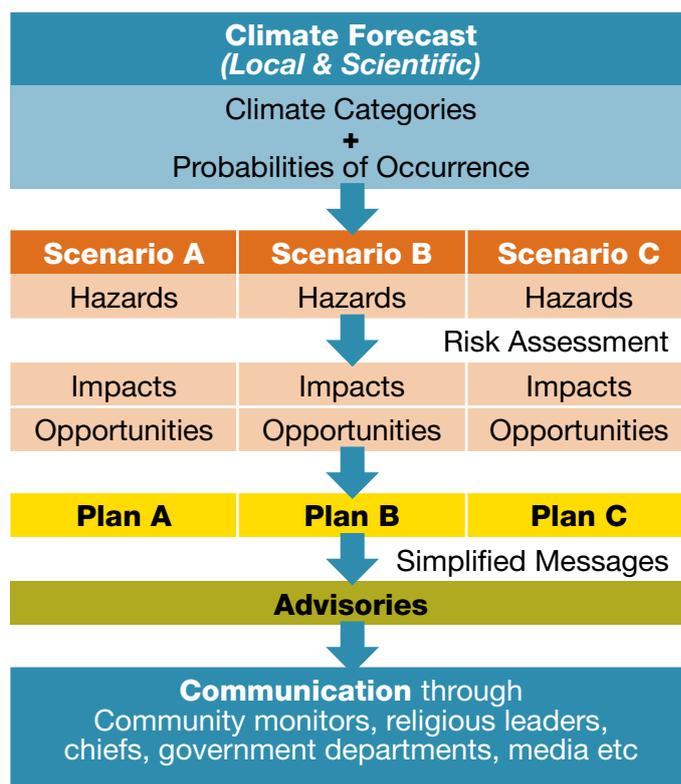


Table 1: An example of advisories for the March to April season, with a below normal rainfall probability, developed during a PSP workshop in Garissa, Kenya, in March 2012. The advisories addressed information needs for the two major livelihood groups in Garissa i.e. pastoralists and agro-pastoralists.

Possible Impact of below normal rainfall	Advisories (Agro Pastoralist Community)	Advisories (Pastoralist Communities)	Lead government department
Crop Failure and Seed loss	<ul style="list-style-type: none"> -Preserve last years' harvest -Increase area under irrigated agriculture -Early land preparation and planting of early maturing and drought tolerant seeds -Diversify crop production -Diversify livestock production (e.g. include bee keeping) 	Early land preparation and planting of early maturing and drought tolerant seeds (for rain fed agriculture) e.g. sorghum, millet, green grams, and cowpeas	Ministry of Agriculture
Poor Livestock body conditions	<ul style="list-style-type: none"> -Off-take of weak and old animals -Supplementary feeding for lactating & young animals -Herd diversification (include emerging stock) -Timely vaccination / mass treatment -Fodder production and preservation under irrigated agriculture 	<ul style="list-style-type: none"> -Off-take of weak and old animals -Supplementary feeding for lactating & young animals -Herd diversification (include emerging stock) -Timely vaccination / mass treatment 	Ministry of Livestock Development
Natural Resource based conflict (e.g. over water sources)	<ul style="list-style-type: none"> -Adhere to water users by laws, practice proper hygiene -Enhanced irrigation farming to ensure better harvest 	<ul style="list-style-type: none"> -Adhere to water users by laws, practice proper hygiene -Enhanced irrigation farming to ensure better harvest 	<ul style="list-style-type: none"> -Ministry of Northern Kenya and other Arid Lands -Ministry of Water
Migration (loss of labourers; reduced numbers of decision makers)	<ul style="list-style-type: none"> -Diversification of crop and livestock production (longer term) -Enhanced irrigation farming to ensure better harvest 	<ul style="list-style-type: none"> -Diversification of crop and livestock production (longer term) -Enhanced irrigation farming to ensure better harvest 	<ul style="list-style-type: none"> -Ministry of Agriculture -Ministry of Livestock
Higher incidence of school drop outs	<ul style="list-style-type: none"> -Food for school fees campaigns -Government sponsored bursaries 	<ul style="list-style-type: none"> -Food for school fees campaigns -Government sponsored bursaries 	-Ministry of Planning (CDF) and Ministry of Education
Human wildlife conflict	<ul style="list-style-type: none"> -Fence farms -Develop separate water troughs for domestic animals and wildlife 	<ul style="list-style-type: none"> -Fence farms -Develop separate water troughs for domestic animals and wildlife 	<ul style="list-style-type: none"> -Ministry of Livestock Development -Kenya Wildlife Service

BENEFITS OF PARTICIPATORY SCENARIO PLANNING FOR INFORMING CLIMATE-RESILIENT LIVELIHOODS AND DISASTER RISK REDUCTION

Climate scenarios equip communities and local governments with information for use in decision making on diversification of livelihood options, risk management and preparedness to deal with disasters. The added value of PSPs is in enhancing discussion on possible scenarios which enable more flexible planning and risk management rather than treating a forecast as a guaranteed outcome.

Timely access to and communication of seasonal climate advisories from PSP empower communities to take advantage of opportunities that climate presents, which is a key part of adapting to climate change^{vi}. This is through developing plans that make the best use of resources to improve livelihoods, while managing risks. In Garissa, Kenya, for example, expected increased rainfall in October to December 2011 season was a chance to improve agricultural production by making plans to harvest water and store it for use during dry periods, expanding the size of land under cultivation as more water is available for growing crops and the flooding brings in deposits of fertile soils, reseeded of rangelands is made possible, among other opportunities.

Discussion of opportunities even when the forecast is for a poor season (i.e. when there is not enough rainfall) encourages thinking around how activities by different livelihood groups can be mutually supportive. For example, a PSP can raise the need for negotiation between different land users and lead to a plan by agro-pastoral communities living near a river to cultivate more irrigated fodder to avail much needed feed for pastoralist communities, especially for their young and weak livestock which are often lost as they migrate



Figure 4: Noor Jelle, a farmer from Nanighi village, in Garissa, Kenya, with his bumper maize harvest. After hearing the seasonal forecast for good rains, Noor decided to plant more improved maize seed supplied by the Kenya Ministry of Agriculture.

in search of pasture. This can increase the resilience of pastoral communities to the lack of pasture during the poor season. At the same time, agro-pastoral communities are assured of a local market and income from their produce. This example of PSP discussions shows how it can create a better understanding of issues for the different livelihood systems and help to prevent one group undermining the adaptive capacity of another group living in the same ecosystem.

Advisories developed during PSP workshops provide communities with necessary information for planning Disaster Risk Reduction (DRR) actions. For example, information on the risk of increased disease incidence due to high amounts of rainfall enabled communities in Garissa to take action to protect human and animal health. Increased prolonged drought over many years has led livestock keepers to swap cattle for hardier goats, but in a normal to high rainfall season, goats are more susceptible to diseases such as foot rot. Actions included buying mosquito nets against increased malaria risk and vaccinating animals through linkage with the Kenyan Ministry of Livestock.

Developing scenarios of hazards and impacts, and plans for each scenario allowed participants at the PSP workshop to see the need for a main course of action, based on the most likely scenario, but also the importance of making contingency plans. See Box 3 for details on handling seasonal forecast probabilities. The scenarios encouraged communities to think about what can be done in response to other climatic possibilities, so as to reduce the risk of adverse impacts in case the season turns out to be different from what is forecasted with highest probability. The involvement of local government and NGOs during the PSP process is an opportunity to discuss support for the contingency plans.

In addition, PSP allows for adaptation issues and priorities to be identified higher than at the community level. For example, in pastoral and agro-pastoral communities in Kenya, it emerged that addressing access to and management of water and other natural resources during all seasons was very important. A land use management system, involving all the different land user communities with land use planning at a landscape or watershed level, was proposed to enable more coordinated adaptation actions across land users and livelihood groups over the longer term. This in turn means not only climate resilience of different groups and communities, but also of the ecosystem by including environmental protection strategies in the land use plans.

BOX 3: DECISION MAKING PROCESS USING SEASONAL FORECAST PROBABILITIES

During a PSP workshop held before the October to December 2011 “short rains”, the seasonal forecast for Garissa, Kenya was given as 45%, 35% and 20% probability of normal, above normal and below normal rainfall respectively. These probabilities expressed the degree to which it was certain that particular rainfall amounts would be received. Each of these probabilities was discussed to draw out scenarios of possible climatic hazards, and the risks posed by the hazards. Opportunities arising from each were also discussed, based on the current and past status of livelihoods. For example, in agriculture, following on from severe drought, communities were faced with a 45% chance of experiencing a good season, but with the risk of increased incidences of some crop pests and diseases, a 35% risk of crop destruction by disease and floods and a 20% risk of crop failure due to water stress. Plans to deal with each possible opportunity and risk were discussed and the information generated was turned into simple and clear messages, or advisories, of what communities can do given the probabilities presented by the forecast.

This information was used in making local agricultural decisions by prompting consideration of the different types and varieties of crops that would respond to the different levels of risk. Decisions were made about what crops to plant in the coming season, and crucially, how much of each crop type and variety to plant so as to spread the risk of total crop loss due to whatever climate that actually occurred. Plans were also made about risk reduction strategies that needed to be put in place by communities, and how local government and NGOs could support these strategies through their ongoing and planned activities. For example, livestock keepers were able to relocate their herds away from possible flood areas, and local animal health projects facilitated vaccinations and treatment.

Information generated during PSP workshops, therefore, contributes to communities’ capacity to make forward-looking and anticipatory decisions and plans for climate-resilient livelihoods and DRR. Presenting and discussing more than one climatic possibility also encourages flexible planning and risk spreading, all contributing to building local adaptive capacity to deal with different future climate eventualities.

PARTICIPATORY SCENARIO PLANNING AS A MULTI-STAKEHOLDER PLATFORM FOR ADAPTATION DIALOGUE

By bringing together community members, meteorologists, local government and local NGOs, PSP workshops provide a common forum for all these actors to dialogue on important issues affecting the local area. These are stakeholders who would not normally meet, yet their collective knowledge and expertise is essential for successful adaptation. The PSP process places all actors and their knowledge on the same level, presenting an open space for stakeholders to negotiate local priorities and their contribution to adaptation, with the assistance of an external facilitator (ALP, in this case, but it could be any relevant adaptation practitioner). This face to face and open dialogue around a climate forecast motivates:

- Plans which are more responsive to local needs;
- Better informed and more coordinated action between sectors in support of local priorities and adaptation strategies.

The multi-stakeholder dialogue also raises the need to place PSP into a larger climate communication system, forming a coordinated and sustainable linkage between all actors for informed adaptation actions on a seasonal basis. A climate communication system allows for:

- Information from PSP to reach the wider community, local government departments, local NGOs and service providers;
- Regular access to climate information to inform community plans, and local government resource allocation, plans and actions;

Meteorological departments learn what information is needed by different users, so that the users can make better decisions in a changing climate.



THE VALUE OF COMBINING DIFFERENT KNOWLEDGE SYSTEMS

Sharing community knowledge on past climate and seasonal predictions in the local area during PSP recognises that rural communities have an intimate interaction with the climate at a local scale as they go about their livelihood activities. This locally relevant knowledge is not available elsewhere. Communities are well placed to give information about local climatic impacts based on their experiences, informing impact scenarios developed using seasonal forecasts. Impact information from different groups within the community, and from women, men and youth gives insight into how seasonal climate is affecting the different groups and gender roles and responsibilities, and how each group is responding to changes experienced. Community knowledge, from women and men of different social groups, makes an important contribution to understanding past and current differential capacity and vulnerability, which can be useful for building scenarios of how long term climate changes may impact communities. Hence, flexible strategies that respond to the different levels of risk presented in the impact scenarios can be developed, increasing the chances that communities will be resilient to the long term future climatic changes.

Community knowledge on climate information is also faced with new challenges. For example, the behaviour of some biophysical indicators used in local climate prediction (e.g. behaviour of birds) has changed along with the climate, making them less reliable. Community knowledge also has limitations e.g. the Somali community in Kenya had an idea of when the rains would start but found it difficult to estimate when rains would end. This then is the entry point of scientific climate information. Meteorological seasonal forecasts provide information about the timing of onset and cessation of rains, possible distribution over time and space, as well as the probability of different occurrences within the season. PSP brings appreciation of the complementary nature of local and scientific knowledge and enables understanding of the different methods of climate observation and forecasting. This helps to build trust between the two sources of information and knowledge, encouraging them to work together to support informed decisions and plans for livelihoods and DRR. Linking community knowledge of past climate and livelihood impacts with past climate data can reinforce this further, and allow for improved interpretation of future forecasts. ALP plans to develop this idea further, building analogues through comparisons between forecasts, past data and actual experience.

STRENGTHENING ADAPTIVE CAPACITY: LEARNING HOW TO LIVE WITH CHANGE AND UNCERTAINTY

Participation of meteorologists in PSP workshops allows for their important contribution and expertise to be brought into the adaptation and development planning process. It has allowed for dialogue between the actors present on experiences in using scientific climate information, on the quality of service provided, as well as gaps and challenges. Such dialogue is necessary for meteorologists to get feedback on the information they provide, allowing them to improve and respond to changing local user needs. For example during the second PSP organized in Kenya in March 2012 it emerged that during each season, communities are faced with different climatic risks and their capacity to deal with the risks is also different, based on climatic impact and the impact of response strategies that were implemented in the previous season(s). These differences from season to season, year to year are becoming more pronounced as the climate changes.

As communities also make adjustments to their livelihood activities in response to the changes in risk and capacity, their information needs are changing and will continue to change. PSP enables meteorologists and the participating local governments to understand this so as to provide relevant information and services to meet local adaptation needs. This highlights the importance of continuous access, understanding, communication and use of climate information to assess local risks and plan for livelihoods and DRR at the local level. It underscores the fact that change is continuous; hence adaptation to climate change means a constant process of adjusting to current and anticipated climate in a manner that enables communities to remain resilient and continue developing sustainably.

For this, **enhanced adaptive capacity** is needed; that is, capacity for communities to:

- demand for access to climate and other **information** that is tailored to local needs, enabling them to identify, assess and choose relevant adaptation options that will allow them to live with the uncertainty that climate change presents;
- **innovate** in response to the challenges and opportunities of climatic possibilities which were unknown in the past;

- make **forward-looking and flexible decisions** and **plans** that evolve with and adapt to the changing climate;
- consider how best to harness the **asset base** taking advantage of the opportunities offered by seasonal climate and to protect the asset base against climatic risks, when developing local adaptation options;
- link **institutions** in a climate communications system, recognizing the importance of governance and entitlements for decision making.^{vii}

CONTINUITY AND SUSTAINABILITY OF THE PSP PROCESS

The PSP process is designed to be driven by communities and local government, by purposely involving them and building their understanding of the importance of forecasts and their levels of uncertainty for decision making in a changing climate. This encourages integration of PSP into community and local government planning, hence continuity of the process. In Kenya, for example, a first step was made during the first PSP when local government participants decided to form a taskforce, composed of community members, officials from various government departments and local NGOs. The task force has already taken over the dissemination of advisories from PSP and will organize future PSP workshops. Linkage with other existing committees/communication mechanisms such as those on DRR will strengthen the sustainability of the PSP process. Sustainability would be achieved when local government planning processes recognise the importance of and provides resources for the participation of meteorological services and community forecasting experts to help refine plans on a seasonal basis, and for systems for dissemination of advisories.

Increased community capacity to understand, use and benefit from climate information builds their demand for the information. Since people have to continuously adapt to a changing climate, there is need for the sustained information sharing and dialogue that PSP forums promote.

POTENTIAL FOR FURTHER USES OF SCENARIO PLANNING WITHIN COMMUNITY BASED ADAPTATION (CBA) PROCESSES

The CBA planning process engages communities in developing future visions for development as a way of determining local adaptation strategies. Other adaptation practitioners^{viii} have expanded this into elaboration of socio-economic scenarios for development. Inclusion of information drawn from PSP minimizes the risk of creating visions and development scenarios which changes in climate may render unattainable. This entails using future climate information to come up with scenarios of community visions under different possible climates. It means including climate as one of the key factors determining development scenarios^{ix} that directly affect development paths in addition to for example, policies and investment pathways. Appropriate and effective options and combinations of options that will help communities to adapt to impacts of future climate change can then be determined.

However, there are gaps and challenges in fully integrating PSP into the CBA planning process, prominent of these are the need to:

- Extend PSP down to community level to allow for detailed knowledge sharing and discussion by the range of vulnerable groups and planning which responds to their differential capacity as well as vulnerability to climate change impacts, in particular gender differences;
- Broaden PSP to include temperature information and other forecasts, which are currently not covered by conventional seasonal forecasts;
- Mainstream seasonal forecast interpretation and communications into local government planning processes;
- Mainstream dissemination of advisories for coming seasons in a language and through local mechanisms which are accessible to all – recognising access can be highly gendered;
- Conduct PSP using climate information for longer timescales, to develop options for adapting to longer term climate change, an exercise which may require a different approach.

Dialogue between stakeholders is a first step towards finding solutions to some of these gaps and challenges. Sustained dialogue is also paramount to stakeholder understanding of the implications of climate change and developing actions to respond to current and forecasted climate as well as the inherent uncertainty and risks. This creates new relationships and capacities for effective adaptation and development that is climate-resilient.



Participatory Scenario Planning Brief

ABOUT THIS PARTICIPATORY SCENARIO PLANNING BRIEF

The Adaptation Learning Programme supports improved communication of climate information to vulnerable rural communities and local governments as a key element of community based adaptation to climate change impacts. Participatory scenario planning, or PSP, is one approach which uses seasonal climate forecasts to inform decisions for more resilient livelihoods and risk management, thereby strengthening adaptive capacity. PSP workshops create a multi-stakeholder platform for collective interpretation of meteorological and local forecasts and their probability and uncertainty. This brief describes the PSP process and its outcomes and benefits. PSPs in Kenya and Ghana have already resulted in enhanced relations between meteorologists and local actors, flexible locally owned decision making and greater confidence in local knowledge and innovation.

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ENDNOTES

- i. IPCC, 2012: Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp.
- ii. IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- iii. See Local Adaptive Capacity (LAC) framework at: <http://community.eldis.org/59d669a8/research.html>
- iv. Climate knowledge, uncertainty and risk are recognized as key factors in CARE International's CBA Framework, see http://www.careclimatechange.org/files/adaptation/ALP_Contact_Card.pdf
- v. See <http://ccafs.cgiar.org/scenarios>
- vi. IPCC Third Assessment Report, 2001a
- vii. This breakdown of adaptive capacity follows ACCRA's LAC framework (See endnote iii).
- viii. This is an approach used by the Climate Change Agriculture and Food Security (CCAFFS) program, <http://ccafs.cgiar.org/scenarios>.
- ix. For example, see participatory scenario development conducted as part of the World Bank study on the Economics of Adaptation to Climate Change <http://climatechange.worldbank.org/sites/default/files/documents/EACCSocialSynthesisFinal.pdf>

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