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General

The dilemma of climate information for smallholder farmers

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Introduction

Awareness of risks associated with climate change and climate variability is critical for agriculture smallholder farmers in building and developing adaptive measures. At the core is climate information, an important variable for both decision making and for the sustainability of communities and livelihoods. Access to climate information by farmers is vital: farmers need to know when it will rain, the timing and length of the rain season, how heavy rains will be, and if there will be any dry spells. This climate information enables farmers to make decisions on: crop selection, selection of crop varieties, buying inputs, harvesting, shifting livestock to other locations, and so forth. The climate information also serves as a warning on impending extreme climate variabilities such as floods and droughts, with far reaching economic consequences.

Two main sources of climate information are the scientific information forecasting (SCF) by country meteorological departments, and traditional forecasting. It is important to discuss how information generated from these sources is passed on to the end-user, the smallholder farmers, and whether the climate information generated is meeting its intended objectives. The value of climate information cannot be underemphasized. Smallholder farmers, in the main, lack the savings and insurance and other secure ways of making a living to help them recover from an extreme event, and remain more vulnerable to its effects.

Scientific forecasting

Modern-day climate scientists have been developing seasonal climate forecasts with increasing accuracy over the years, using the knowledge of the physics of the atmosphere to predict the most probable future weather/climate scenario. This has enabled improvement on tools for climate observation, monitoring, prediction and early warning systems.

Scientific information is relayed by meteorological departments that generate it, and is broadcast by radio and television at certain times of the day, and conveyed by newspapers. One assumes the climate forecasts to be readily accessible to farmers. That this is not so is largely attributed to the way climate information is packaged and targeted, inability of meteorological offices to link information with actual users, the distortion of information along the supply chain to the final end-user, and indeed that they may not have access to media sources. The way information is packaged has some serious problems: (i) farmers need clear messages and not probabilities as typical with weather forecasts; and (ii) the meteorological information is not downscaled enough to be usable at local level. Even though media sources can be relied upon to reach the end-users where farmers have access to these sources, there is no guarantee that farmers listen to radios and television weather broadcasts. Other channels may, instead, be more popular or there may be other priorities at the time. By implication, climate information may not be reaching its intended targets, and where it does, not it a way that makes it very usable. Large information gaps therefore remain.

Traditional forecasting

Information deficit resulting from SCF leads farmers to rely on other forecasts, such as traditional sources of information. Traditional forecasts have been generated by communities over time to allow them to understand and cope with their particular agro-ecological or socio-economic environment. They form the basis of community level decision making mainly in terms of food security or socio-economic activities, and have been preserved through methods such as oral tradition and demonstration. This is not surprising since over the years communities/livelihood groups have developed their own climate prediction schemes based on observations of behaviour of surrounding environments.

Table 1 shows some examples from traditional sources. The traditional approach thus provides information about likely future events enabling farmers and communities to take the necessary preemptive actions to reduce vulnerability. The traditional approach is dynamic and is continuously evolving through internal creativity or external influences. Information is usually disseminated at community gatherings attended by a range of stakeholders, in some cases, including agricultural extension workers.

The general problem the traditional approach encounters is that it is hardly documented and information given applies to a given local radius. This way, the traditional source is at the other extreme of SCF, which is highly aggregated. Worse still, traditionally used indicators previously used to make critical decisions are now proving less reliable. It is not just researchers who are challenging their assumptions, but vulnerable communities are also questioning the viability of some of their traditional knowledge systems.

Table 1: Indicators of drought and rain based on indigenous knowledge

Indicator	Indication
Plants	Fast bearing of fruits – good rains while immature dropping of fruits – drought Higher than normal flowering density of certain tree species
Ambient temperatures	Higher than normal especially at night – good rains; lower than normal – poor rains Behaviour of domestic animals Some local communities look at intestines of freshly slaughtered animals (lamb) to indicate onset of a dry or wet spell Higher than normal frequency of goats mating in August – September suggests lots of rain. On the contrary, increased libido in donkeys is an indicator of below normal rainfall and a possible drought in the coming season The appearance of frequent and many spider webs are signs of good rainfall Nesting of birds high on trees or of crocodiles high on the ground near rivers are signals of likely flooding
Appearance of the moon	First rains just before the appearance of the new moon – good rains Full moon covered by clouds – good rains
Nature	Heavy thunderstorm – good rains. Direction of the winds indicates the weather conditions, whether it will be a dry spell or wet period Dew forming can be seen as a sign of precipitation of rain, and whirl winds signifying drought and absence of rain Occurrence of army worms – drought Butterflies are used to signify the onset of rainfall and a dry spell

Constraints with modern forecasts

Farmers are strongly motivated to use data and information on climate variability and change provided it is in form and language they understand and can use, and when this is accompanied by relevant advice that help them apply the information, for example, to their planting and cultivation activities. For farmers and extension workers the climate forecasts are useful, but not sufficient. Obviously, scientists cannot predict the weather with enough lead time and precision to warn farmers when to plant or about upcoming risks.

Information providers are learning that they need to go further in providing regular updates and meaningful advisories to complement their seasonal forecasts. For farmers, the limitations of forecasting have reinforced the need to employ a range of strategies to deal with uncertainty. Working with traditional knowledge providers opens channels for greater dissemination of climate information, in languages and forms that are useful to rural farmers.

Challenge

Both traditional and modern knowledge types have their own merits and demerits. The reason that indigenous knowledge sources are preferred by the local communities is because it blends well with cultural norms and has been tested and used for a long time. Even though the two knowledge bases (traditional and modern) are very different, both try to solve the same problems. Merging the two sources of information may lead to better climate risk management at the local level and promote poverty reduction and sustainable development.

The modern meteorological forecast would be more helpful downscaled so that precise information can be provided and not in terms of generalities. Harmonizing modern and traditional forecasts is a step forward based on the willingness of traditional forecast users to allow scientists to test their climate knowledge and methods.

Note

The views contained are those of the author and do not represent the views of the International Development Research Centre.