Experiential Learning

THE SEASONAL FORECAST GAME

Experiential learning about seasonal forecasts and decision making under uncertainty

Bettina Koelle

Adaptation planning and implementation on the local level often attempt to include scientific climate information to ensure the measures are successful and that mal-adaptation is avoided. Because farmers often actively consider expected weather patterns in order to take farming and thus livelihood decisions, one would expect a strong interest by farmers to engage with and learn from seasonal forecasts.

However the use of seasonal forecasts also poses many challenges:

- Seasonal forecasts are models that are inherently incorrect.

- The seasonal forecasts provides generic information in a way that requires farmers to understand concepts of probability, uncertainty and percentage.

- The seasonal forecasts have a varying degree of uncertainty attached to them and thus the reliability of the seasonal forecast might vary as the global weather patterns change.

Nevertheless, seasonal forecasts can provide important insights and support more forward looking and creative decision making by farmers if they form part of a more integrated learning and action research process that explores opportunities and limitations of seasonal forecasts with the farmers in a learning partnership. One of the key challenges in climate change adaptation is discovering appropriate ways to deal with the inherent complexity and uncertainty of planning for the unknown. In this context games can provide tools to support the exploration of these uncertainties and help share different adaptation strategies, using the collective intelligence of members of vulnerable groups (Mendler de Suarez et al., 2012).

Although farmers recognized that seasonal forecasts could make a useful contribution towards enhanced planning and supporting sound on-farm decision making, they

Photo 1: The first trial of the Seasonal Forecast game stimulated discussion and generated enthusiasm.

experienced the seasonal forecasts (expressed in percentage of increased or decreased change of above or below average weather events) as too abstract and not easily understandable. In this light a seasonal forecasts game was developed to help farmers explore the opportunities and limitations of seasonal forecasts in more depth by simulating the experiences of anticipation and response in a learning environment. The process of designing the game, an interactive learning process itself is described and some reflections on the opportunities and challenges using games in adaptation processes are shared. While games can be important tools for facilitation of experiential learning, they should be carefully designed to foster a creative learning process towards transformative adaptation, and should avoid mere instruction via the promotion of a pre-determined message.

This paper describes the process followed in three rural communities in South Africa (Suid Bokkeveld, Wupperthal and Ericaville) exploring the use of games for communicating the value and limitations of seasonal forecasts and discusses the benefits and possible risks of such an approach.
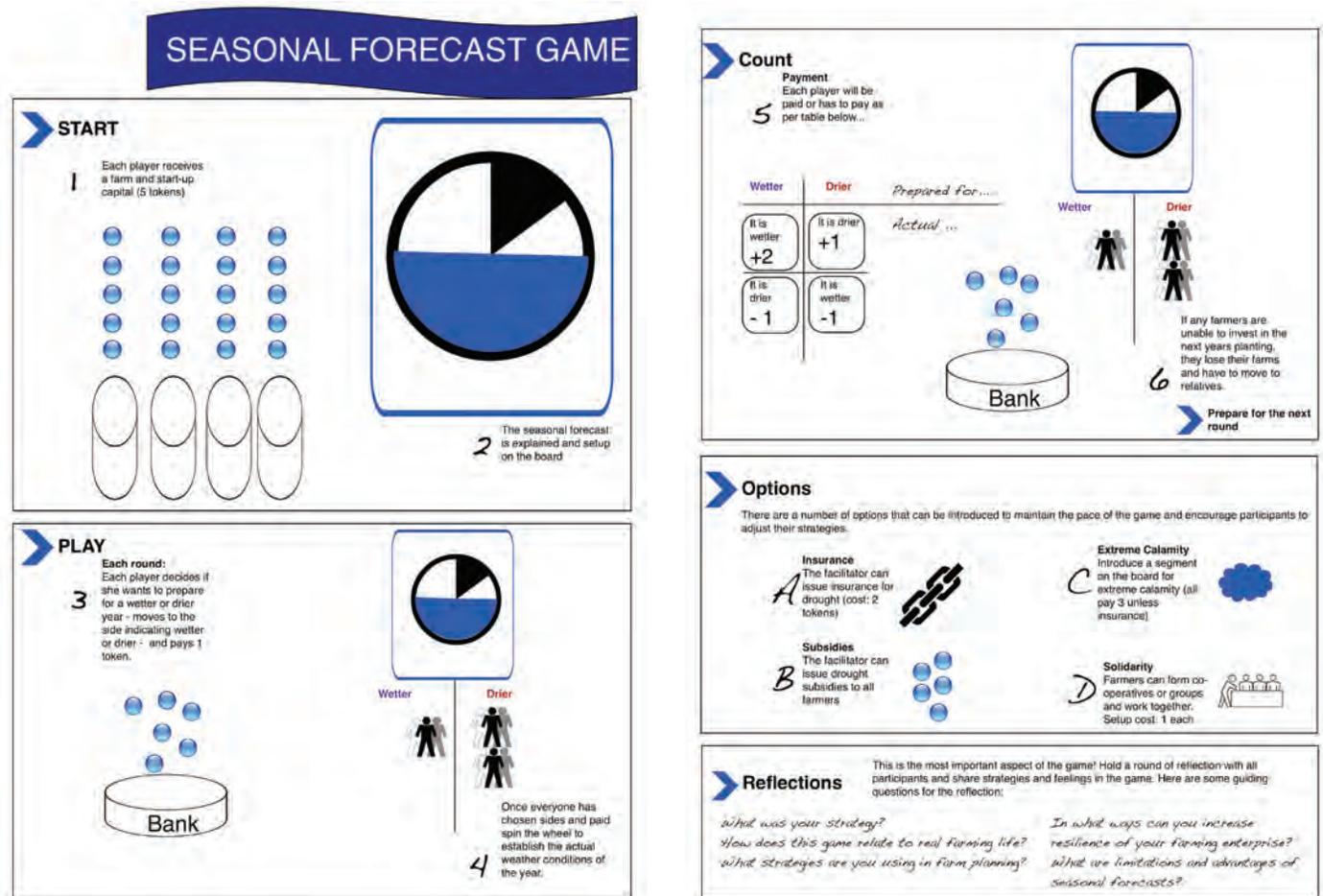
Figure 1: Overview of the Seasonal forecast game (diagram: B. Koelle)

New ways of learning

Carefully designed, serious games offer a means to provide opportunities to engage with aspects of complex systems in dynamic ways and thus support individual learning and capacity development. They can also improve decision-making by providing an alternative platform for experiential learning (Bachofen et al., 2012, Mendler de Suarez et al., 2012).

People have played games since prehistoric times, and in diverse cultures they provide a means of exploring patterns of change. Designing effective games in the context of climate change adaptation implies creating experiences for players that have meaning and give rise to useful insights. Salen and Zimmerman (2004) term this goal of game design "meaningful play". Game design crucially relies on there being a clear goal of the game and clear and understandable rules that in combination can predictably simulate a certain experience (Brathwaite and Schreiber, 2009).

Designing the seasonal forecast game

The Game Design process

The South African Weather bureau publishes seasonal forecasts. We used these forecasts in the climate change preparedness workshops (see Adaptation and beyond No 8). They provide forecasts expressed in percentages of likelihood that the temperature / precipitation will be higher or lower than the long-term average. The forecasts are made to cover a three-monthly period and are updated every month and are circulated via email.

The challenge with the seasonal forecasts is that they are not able to give a clear prediction for the farmers (e.g. they are not able to predict with certainty that it will be wetter and cooler in a certain period) because of the inherent uncertainties of weather prediction. It has thus been challenging to communicate clear messages to the farmers without oversimplifying or leaving farmers with the feeling that the seasonal forecasts are complicated and not useful. In response to the challenges of communicating and exploring the meaning of seasonal forecasts with farmers we embarked on the process of developing a game that would help farmers explore the complexity and the potential use and limitations of seasonal forecasts.

In response to the observed challenges of making seasonal weather forecasts understandable and useful in planning farming responses, Bettina Koelle devised the seasonal forecast game to enable participants to receive forecast information, make choices based on likelihoods of different outcomes, and to experience uncertainty despite the seasonal forecast.

The game was conceptualized to allow farmers to experience the link between the percentages expressed in a seasonal forecast and the unpredictable outcomes in order to create a platform to discuss possible adaptation strategies.
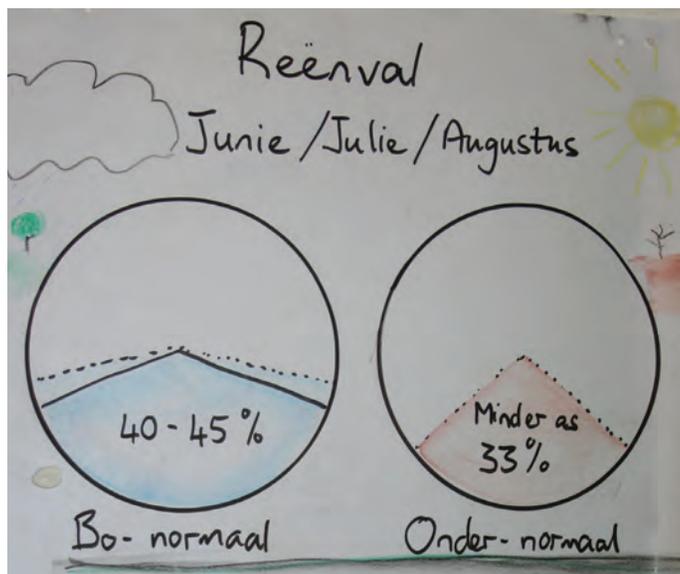
Photo 2: The seasonal forecast is translated in a pie-chart, representing the seasonal forecasts for above/ below average: minimum temperature, maximum temperature, precipitation for a three month period. (Photo: presenting the seasonal forecast at the climate change workshop in Wupperthal / South Africa; Photo: B Koelle)

The game design was an iterative process. The initial game was designed and tested with a group of colleagues prior to the first farmers' workshop. In all three areas a reflection session after the workshop was documented and some aspects of the game were improved, considering feedback and new ideas from the farmers.

The rules of the seasonal forecast game

The seasonal forecast games needs few materials and little preparation: a board with a swinging arrow to simulate the seasonal forecast, 5 tokens (glass beads or beans) in a cotton bag for each participant, insurance tokens and a string or long narrow piece of fabric.

The principle of the game is explained via a story line told by the facilitator: As part of a government land reform programme a number of farmers acquire land and start-up capital (the players). A cotton bag and tokens symbolise the farm and cash resources owned by each player. Each year the farmers, who are practicing rain-fed agriculture, face a difficult choice: should they prepare for a drought and invest in preparing for this (for example by purchasing more rainwater tanks and additional dry feed) or should they prepare for a season of plentiful rain year by ploughing their lands and investing in seed and livestock?

Once the principle of the game has been explained and each player has received a bag with their tokens, the seasonal forecast for the first round of the game is shared and each farmer is asked to physically move towards the side indicating which strategy s/he will follow for the season (i.e. preparing for drier or wetter conditions). Each farmer makes a payment of one token to buy agricultural inputs (e.g. rainwater tanks and feed vs. seed and diesel for ploughing). Once all farmers have paid, the dial is spun – determining the weather of the year.

Should the farmer have prepared for a good rain and the spinning arrow comes to rest in that part of the dial indicating that the rains have indeed been good, s/he is rewarded for the above-average rainfall conditions by 2 tokens. On the other hand, if the farmer has prepared for a drought, and the arrow indicates that the rainfall is indeed below average, s/he can retrieve the price of their investment (1 token), but cannot make a net profit. Those farmers whose predictions are not matched by the "actual experienced weather" receive nothing, their investment is forfeit and they have to pay one additional token to the bank, representing their further losses.

After the round is concluded and the players have all made payment or received tokens, the seasonal forecast is adjusted and another round begins. If a farmer is no longer in a position to invest in farming inputs, the farm will be dispossessed and given to another land-reform beneficiary. The game is over when only few farmers are left in the game. In the course of the game the facilitator can introduce various options (e.g. calamity, drought relief, insurance, solidarity) to maintain high energy levels throughout the game and to allow a deeper learning experience.

The most important part of the game is the final reflection, where the players are asked to share their strategies and why this strategy was successful or unsuccessful in this particular game. The next important step is then to explore the connection to sustainable and resilient farming practices in "real life". Needless to say, luck plays a role in determining the outcomes and individual players will tend to play according to their inherent risk preferences.

Facilitating learning experiences

Games represent complex systems in an extremely simplified way. Therefore it is important to emphasize the crucial role played by sensitive facilitation of games. The facilitator is entrusted to inspire meaningful dialogue (Mendler de Suarez et al., 2012). The game in itself is not intended to teach a pre-determined message, but should rather stimulate the generation of knowledge within the group. This aspect requires a specific skill set, including excellent communication and listening skills. Only if a facilitator can help the players to reflect on their experiences and how this might potentially translate into new insights towards more sustainable practices, will the game be able to achieve an empowering effect. The key to this facilitation process is that the facilitator does not actively guide the discussion, but rather enables exploration of the experiences of the players after the game. This requires the ability to switching from being the "game master" who explains the rules and prepares the seasonal forecasts and keeps the story line alive and the energy flowing, to taking the role of an enabling facilitator of an open discussion.

The seasonal forecast game generates quite some excitement and energy. The interaction of chance and strategy when the arrow is spun during each round can lead to outbreaks of laughter, expressions of disappointment and other emotions. These emotions are important to unlock some of the personal reflections. However, it is crucial to ensure that the game at all times provides a safe space for all participants.

The seasonal forecast game is specifically designed for farmers living in a more arid environment where men and women are allowed to manage land and farm in their own right. If this game is transferred to other context it must be adjusted accordingly to suit the cultural and gender context.

Making sense of the Complexity by using games

The seasonal forecast game experience from the three South African communities provided some insightful and positive post-game feedback. The players especially emphasized the linkages between the their experiences in the game and their experiences in real life. This stimulated some rich discussions and supported to jointly explore aspects of complex livelihood systems the farmers function in.

It should be noted that the seasonal forecast game should not replace sound participatory planning and implementation processes that can assist participants to translate the insights into practice. Indeed, it is crucial that games of this type are integrated in a larger developmental process. This will support on-going learning processes that are likely to ultimately increase anticipatory capacity – the capacity to anticipate and prepare for stressors and shocks in the future. In this context well-conceptualised and carefully facilitated games can offer important insights into complex systems and the intricate human responses to information

relating to anticipated opportunities or stressors. In the move towards transformative adaptation (Pelling, 2011), games may have a crucial role to play in the support of experiential learning for empowerment. However, it is important to be mindful that outside factors relating to power must be addressed in complementary processes in order to achieve just and sustainable transformative adaptation.

Photo 3: It is crucial to create a safe space for learning experientially (Photo: N Oettle)

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