LIVESTOCK MONITORING FOR ADAPTATION

Bettina Koelle & Amanda Bourne

Environmental monitoring can be an important way to explore the complexity of existing livelihoods and to find appropriate ways to adapt to a changing climate. This paper shares two examples from the Namakwa District (South Africa) of action research processes implemented in partnership between scientists, practitioners and small scale livestock farmers.

Small-scale livestock farmers in the Namakwa District have braved extreme weather conditions for many centuries. Situated in the Northern Cape Province, the area known as Namaqualand is as famous for its vast and sparsely populated rangelands, spectacular biodiversity, and spring flower displays, as for its extreme heat and recurring droughts in summer. Livestock farming has been one of the central livelihood strategies for farmers as long as people can remember. However, livestock farmers in Namakwa also face many challenges:

- Climate variability, including droughts and extreme temperatures both high and low, affects livestock health and the availability of grazing.
- A lack of available water of sufficiently good quality for livestock can limit livestock movement and negatively affect livestock health.
- The availability of adequate grazing for livestock is often severely limited due to combinations of limited access to land, poor veld condition and high stocking rates.
- Loss of livestock due to disease and, to a much lesser extent, predators can negatively affect farmers’ livelihoods.
- Market access for farmers is also challenging: many farms are situated in remote areas serviced by poor roads. This limits access to the formal market and often forces farmers to sell to middlemen at reduced prices.

Farmers here are used to farming under highly variable conditions and have developed some strategies to deal with extreme weather conditions, such as moving livestock to higher altitudes in the hot summer months. There is, however, a perception amongst some farmers that weather conditions have become drier and that there are an increased number of days with extremely high temperatures (above 40° C).

Adaptation and Learning: the no-regrets approach

Adaptation to climate change is a serious challenge of our times, and especially urgent when it concerns the adaptation of already vulnerable groups exposed to a variety of stressors. We would like to promote an approach where farmers and scientists work in partnership to find appropriate adaptation responses that are in line with a “no-regrets approach.” No-regrets approaches involve taking active steps to improve economic, social, and environmental conditions whether or not the projected future climate conditions manifest in the lifetime of the farmer, or ever. Despite the uncertainty of future climate, such an allocation of precious resources in the present will increase resilience to shocks and stresses, including but not limited to climate change, and reduce the risk of maladaptation.

Farmers in Namakwa have farmed under challenging climatic conditions for centuries. Many farmers are committed to monitoring as a way to understanding environmental change and to improve management practices. (Photo: Conservation South Africa)
Starting the exploration by formulating the research question
Farmers in the Suid Bokkeveld wanted to understand how extreme temperatures would affect livestock and what action could possibly be taken in anticipation of more days of extreme temperatures in future. Livestock farming and rooibos tea farming are the most important livelihood activities for the small-scale farmers in the Suid Bokkeveld. While an ongoing action research process in the area focused mainly on growing and marketing rooibos tea, farmers felt it was important to broaden the research questions to include livestock. The farmers approached Indigo, an NGO based in Nieuwoudtville, to jointly explore the impact of heat stress on sheep. Indigo (Bettina Koelle and Donna Kotze) in turn made contact with two researchers: Emma Archer (Centre for Scientific and Industrial Research) and Robyn Hetem (Wits University) to ensure a good fit between local knowledge, action research, and scientific methods.

Deciding on the research methodology
In a joint meeting researchers and farmers planned how the research would be done. Everyone expressed what they thought would be an important research question and how the monitoring could be implemented. This process can be a delicate one as the ideas are not always compatible. From the research perspective the easiest way to monitor heat stress in sheep is to place internal loggers inside a number of sheep. This practice was, however, not acceptable to the local farmers as operating on the sheep to insert several large loggers per sheep clashed with their values. These processes have the potential to be alienating to both farmers and scientists, and it is therefore crucial that facilitation ensures careful listening on the part of all parties involved. In this case a research methodology using external temperature loggers attached to collars, visual monitoring of animal behaviour, and weekly monitoring of livestock condition by weighing, was developed as a compromise.

Starting the research and the learning
Actual monitoring started after a joint workshop between scientists and monitors to ensure that the final research methodology was understood by everybody involved. The four women monitors were excited and nervous at the same time to engage in this new venture. Equipped with research diaries and monitoring tools, they each set to work weighing sheep and monitoring the weather and the condition and behaviour of 30 sheep of their own.
In the first week they were supported by a colleague from Indigo providing mentoring and backup. After that, the monitors worked alone until the first review workshop one month later.

Reviewing progress... and making adjustments
In the first weeks, the monitors grappled with research methods that were new to them, and with recording the data. The review workshop was an important step in the process, as it allowed for early adjustment of the monitoring methodology. Weighing and monitoring the condition of the sheep was quite successful, especially because the farmers themselves found the results interesting and started to analyse the data as they went along. Monitors found accurately recording animal numbers and behavior more difficult. Also, the temperature loggers attached to sheep on removable collars were problematic, as many became detached and the monitors spent quite some time searching for collars, globes or loggers that had fallen off, without collecting meaningful data in the process.

Compiling the data and starting the analysis
It is crucial to regularly collect, analyse, and store the monitoring data, and to reflect on any potential weaknesses in data collection, recording, or methods together as a learning process. Currently, the first year data from the Suid Bokkeveld monitors has been collected and captured. The 4 monitors are well prepared for the coming summer season and looking forward to doing another year of monitoring! Much of the data collected have been useful and interesting for the monitors, who are farmers themselves. An additional outcome of participation in the monitoring activities is that the monitors became more assertive when presenting their research at the quarterly climate change workshops.

Monitoring sheep behavior under extreme climate in the Suid Bokkeveld - an important process to strengthen women’s self-confidence and to draw on local knowledge. (Photo: Bettina Koelle)

The temperature loggers that caused extensive search expeditions in the veld: learning from failure is also crucial! (Photo: Bettina Koelle)

Weekly weighing and condition assessment of the sheep - an easy process useful for the farmers (Photo: Bettina Koelle)
A place to start
Farmers in Leliefontein have been involved in the Biodiversity and Red Meat Initiative (BRI), a conservation agriculture programme in partnership with the NGO Conservation South Africa (CSA), for several years. Member farmers decided to implement conservation actions as a means to access expertise, training, and incentives, such as livestock medicines. One of the conservation actions agreed was the reduction of total livestock numbers.

Originally, monthly livestock counts were conducted by CSA staff to determine whether or not individual members had reduced livestock numbers and would qualify for incentives. Later, 3 community members were appointed as livestock monitors. These monitors worked with CSA and the farmers to adjust the process to collect data that would be useful for the farmers, such as management practices in use, timing of the lambing season, and causes of losses, and to make data collection easier. Numbers of adult and young animals, as well as the reasons for any changes in numbers between months, are recorded.

Shifting ownership of data to keep up with changing needs
The BRI has since grown into a cooperative owned and managed by a committee of Leliefontein farmers. Focus has shifted towards a more participatory and inclusive approach that relies on developing best practice together through participatory action research on grazing and livestock management strategies. The monthly livestock counts are valuable to the farmers to inform adaptive rangeland management that can respond to expected temperature increases and changes in rainfall patterns in the future.

Regular feedback sessions enable farmers to engage with the data collected. There has been extensive capacity building – the monitoring team has grown to 5 people, employed full-time by Working for Wetlands, and now capture their own data in excel. The monitors produce their own monthly summaries and use them in the field to keep track of changes in livestock numbers.

Managing data quality
Although there have been great benefits from the monitoring, collecting accurate data has proved challenging. Monitors have struggled to find out the reasons for changes in livestock numbers in combined herds where individual animals did not have ear-tags, or where a temporary or new herder was working. Owners occasionally didn’t know the reason for changes in livestock numbers and it was particularly difficult to count the larger flocks accurately, not least because some of the animals may not make it back to the kraal to be counted every time. Data can be inconsistent or incomplete, and sometimes downright contradictory.

While the data certainly reveals many interesting things, amongst them timing of livestock movement, wetland utilisation for water and grazing, stock post utilisation, and a rough estimation of livestock numbers, densities, and causes of losses and gains in Leliefontein, there are large margins of error. In this case, approximate numbers are sufficient and the learning and partnership around livestock counting and record keeping has been extremely valuable, but this may not hold true in all cases. Practitioners should ensure a sound approach to participatory monitoring determined by their and the farmers’ specific needs. Counting of livestock can be a sensitive issue amongst farmers on communal land, and although we did not encounter this in Leliefontein, researchers are advised to proceed with care and sensitivity.
Conclusions

The two examples have demonstrated that a variety of participatory livestock monitoring themes, approaches, and processes are possible given different contexts and research or monitoring aims. The topic and approach taken should be appropriate to the questions at hand, considering both the priorities and needs of the participating local farmers and the contribution that scientists can make in terms of addressing these questions with rigor, replicability, and usefulness of the data in mind.

Only if the monitoring approach is tailored to answer farmers’ questions, are the results of an action research process useful to inform change of management practice and adaptation action. In the Suid Bokkeveld example, a research question around impacts of heat stress was proposed by the farmers according to their livestock management observations and interests. Monitoring livestock weight and condition as part of this process proved useful to the farmers for on-farm management.

In Leliefontein, a research question around livestock numbers and the reasons for change was proposed by a partner institution. However, as the farmers worked more with the data set through regular participatory review of the findings, and selected individuals within their community to carry out and report back on the monitoring, a sense of ownership of the process and data collected grew and farmers began to influence the monitoring process and use the data collected more.

Active involvement in data collection and analysis led to an improved understanding of the link between choices around management practices and the health and condition of their livestock amongst the participating farmers in both examples.

While the monitoring is important, the process of partnership is valuable in and of itself. Facilitating a process of participatory monitoring should ensure that all participants are equal partners embracing the following principles: Open agendas, transparent monitoring should ensure that all participants are equal partners and selected individuals within their community to carry out and report back on the monitoring, a sense of ownership of the process and data collected grew and farmers began to influence the monitoring process and use the data collected more.

The role that participatory data collection can play in a learning process can also be challenging and must be carefully designed to ensure that the result is both a good learning process and sound data.

Monitoring: Learning vs. Data collection

There is an interesting tension between learning for adaptation and the more scientific methods of data collection. While ideally a participatory action research process does both (collecting high quality data while supporting a stimulating learning process) in practice this is often difficult to achieve.

The risk is all too often to compromise the learning process to ensure sound data collection, especially when researchers have specific outcomes to achieve. In this case, the action research component is lost, and it is likely that the farmers will feel little ownership over the process. A lack of ownership can potentially negatively impact the likelihood that recommendations derived from an analysis of the data collected will be implemented.

On the other hand it is important that the learning process is based on sound data. If the data is inconsistent, the monitoring becomes meaningless. The art is to strike a fine balance and to facilitate a learning process that ultimately supports a sound data collection process in combination with a profound learning experience. Regular mentoring and learning processes accompanying the data gathering process are key to ensure that the process is an effective action research process.

References


Acknowledgements

This research was conducted with the support or a range or organisations, researchers and donors over the years. We would like to especially acknowledge IKI, the Volkswagen Foundation, WWF Green Fund GEF small grants facility, the Hansen Family Trust, BMUB, and the South African National Department of Environmental Affairs Working for Wetlands programme for support to the initiatives described in this publication.

We would like to thank the 4 women monitors from the Suid Bokkeveld community for their dedication to this learning journey (Drieka Koopman, Drieka Kolze, Jannetjie Hesselman, Ragel Hesselman) and our partners from academia Emma Archer (CSIR) and Robyn Hellem (Wits University).

We would like to acknowledge the current chairperson of the BRI, Katrina Schwartz, and previous chairpersons Jennifer Cloete and Bertus Meissenheimer, for their leadership, and the University of the Western Cape and Agricultural Research Centre Animal Production Unit for their input and support.

Supported by:

based on a decision of the German Bundestag

Adaptation and beyond is published by Indigo development & change as a contribution towards effective and participatory adaptation to climate change.

The contributions are varied and demonstrate the multitude of adaptation options we can draw on.

This publication is open access.

Indigo development & change
Nieuwoudtville, South Africa
info@indigo-dc.org
www.indigo-dc.org