



STEPPING UP TO THE CLIMATE CHALLENGE: IMPLICATIONS FOR EXTENSION

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Climatic variability is nothing new

- Climatic variability is a long-term aspect of the South African climate
- It is a feature of the fynbos areas of the winter rainfall region where rooibos (*Aspalathus linearis*) is endemic
- Whether we are facing “normal” climatic variability or long term climatic change, the extension response should be the same

Resilience “explains how transformation and persistence work together, allowing living systems to assimilate disturbance, innovation, and change, while at the same time maintaining characteristic structures and processes”.

Westley et al., 2006.

“The sustainability of natural resource management depends not only on appropriate technology and prices, but also upon the institutions involved in resource management at the local level.”

Local Organizations for Natural Resource Management: Lessons from Theoretical and Empirical Literature

Lise Nordvig Rasmussen & Ruth Meinzen-Dick

Rooibos: green in the driest months



Rooibos: uniquely adapted to climate variability

- Drought resistant rooibos grows in the hot, dry summer
- As a fynbos species, its “fine” leaves enable it to minimise moisture loss
- Its tap root supplies the plant with water from >3 metres below the surface of the soil
- Nitrogen-fixing bacteria provide adequate nitrogen in very nutrient poor soils
- Mycorrhizal association with rooibos roots provides essential plant nutrients



CLOSE

Root clusters: a specialised adaptation

- Root clusters exude compounds which facilitate the mobilisation of nutrients from soil
- Root clusters occur at intervals on lateral roots in the relatively richer topsoil
- Root clusters enable the plant to absorb nutrients that are unavailable to most plants in the dry seasons of the year

Further adaptations

- Rooibos seed can lie dormant for many years before triggered by fire
- Different eco-types are adapted to a wide range of climatic conditions
- Re-seeders are fast growing pioneers adapted to higher rainfall areas
- Re-sprouters are slow-growing, adapted to drier areas, longer lifespan (>50 years)

Wild rooibos is better adapted to drought

- ✓ Wild rooibos can re-sprout from its roots after fire
- ✓ It stores nutrients and water in its roots
- ✓ It grows more slowly than cultivated rooibos



Differences between wild and cultivated *A. linearis* in the Suid Bokkeveld (Louw, 2006)

Trait	Wild (resprouter)	Cultivated (reseeder)
Morphology	Prostrate growth form	Erect growth form
Growth	Post-fire sprouting from basal stem Slow growing	Post-fire mortality Fast growing
Reproduction	Post-fire seed germination Low seed output	Post-fire seed germination High seed output
Resilience	Resilient against pests, drought and disease	Relatively susceptible to pests, drought & disease
Harvest regime	Generally harvest once every two years	Annual harvest

IPCC Fourth Assessment Report

- “Significant and concerning climate change impacts on agriculture”
- Critical negative yield impacts in areas where:
 - food security is already challenged
 - the natural resource base is already poor
- Southern Africa is particularly vulnerable to these impacts

South African responses to the IPCC

- Responses to climate change in agriculture in S A have tended to be conceptualised in somewhat top-down, sectoral ways
- There has been limited recognition that adaptation to climate change is often a simple extension of existing risk management activities
- DEA has invited participation in policy making & planning regarding adaptation

The Adaptation Network

The broad-based Adaptation Network is able to share the learnings of current adaptation practice and contribute its insights to policy making processes in partnership with DEA



Challenges for Extension

- How can we convey complex messages about climate in ways that will not disempower people?
- How can we assist people to build on their own knowledge and resources?
- How can we share the latest forecasts in ways that contribute to creativity and innovation?
- Can we foster enthusiasm about adapting to a changing climate?

Typology of participation	Characteristic
Manipulative participation	Participation is simply a pretence: "people's representatives" have no real power
Passive participation	People participate by being told what has been decided by others or has already happened (attending meetings, etc.)
Participation by consultation	People participate by being consulted, or by answering questions. External agents define problems and information gathering processes, and so control analysis
Participation by material incentives	People participate by contributing resources, for example labour, or access to land, in return for food, cash or other material incentives.
Functional participation	Participation seen by external agencies as a means to achieve project goals, especially reduced costs. People may participate by forming groups to meet pre-determined objectives related to the project.
Interactive participation	People participate in joint analysis, development of action plans and formation or strengthening of local institutions
Self-mobilisation	People take initiatives independently of external institutions to change systems. Governments and NGOs should provide an enabling framework of support

A case study in adaptation

The Suid
Bokkeveld is
situated in the
Northern Cape
Province of South
Africa on the
Bokkeveld
Plateau



The Suid Bokkeveld

Small scale farmers in the Suid Bokkeveld rely on rooibos tea for their annual cash incomes. The other important livelihood is livestock (sheep and goats)



Whose problem is it anyway?

Children are likely to be the ones who have to increasingly deal with the effects of climate change and who will have to develop adaptive strategies



A Participatory Action Research Approach

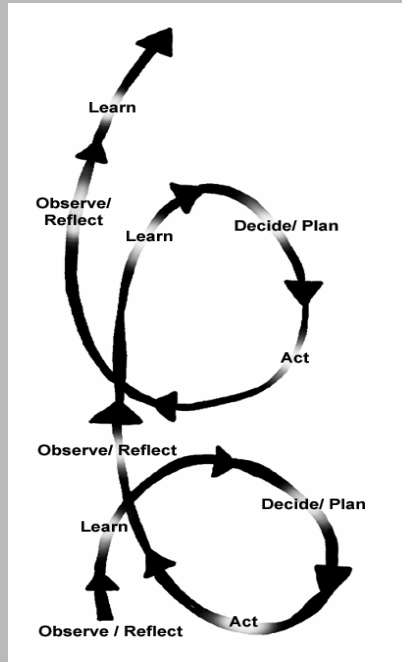
to increase resilience to climate change



PAR

“Participatory Action Research is a methodology that aims to bring about improvement ... by activating in the people involved in the situation a learning cycle”

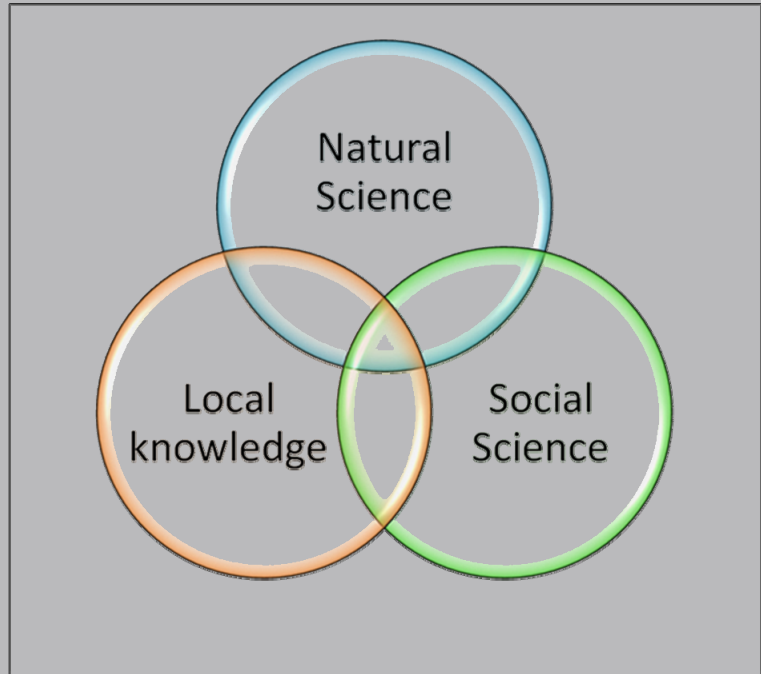
Buellow (1989)



PAR

The integration of science and local knowledge can be enhanced through a PAR approach.

Synergies can be fostered and will enable us to find solutions to complex problems



A local institution to promote resilience

The Heiveld Co-operative was formed in 2000 to further the interests of the small farmers by establishing a joint marketing channel for “fairly produced” organic rooibos

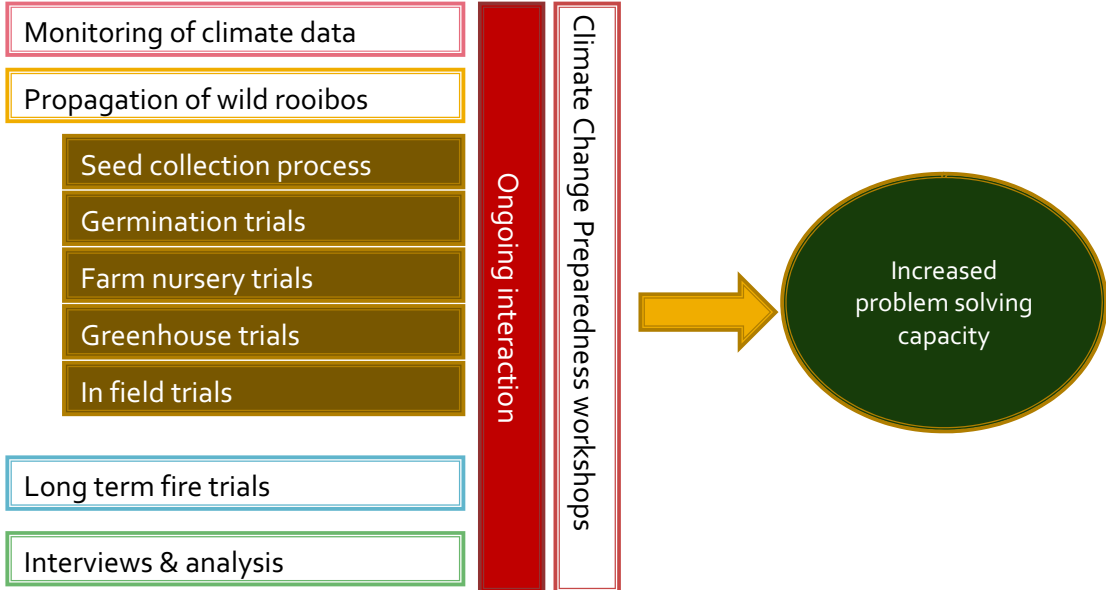


The road to a better future.....

Market access was a key challenge to the farmers.....but once it was being addressed by the Co-operative, the drought of 2003-2006 brought huge losses of cultivated rooibos and widespread hardship



Methodology



Climate Monitoring & Reflection



CLIMATE DIARIES

- Monitoring each month
- Weekly minimum and maximum temperatures
- Rainfall events and mm
- Observations
- Farming activities of the month
- Planning for the next month



CLIMATE CHANGE WORKSHOPS

- Report back of activities & research
- Climate Calendars and reflection on past weather
- Quarterly forecasts presented
- Reflection on new topics for research and experimentation
- New planning & implementation

Participatory Video & Enthusiasm

Participatory Video was used to document farmers perception of the climate and general challenges they are facing

Telling their stories on video generated enthusiasm which has motivated people to act



Wild rooibos and drought resistance

- In the drought of 2003-2006 most of cultivated rooibos died
- Most of the wild rooibos survived because it is far more resilient to drought



Local knowledge +
science = appropriate
solutions to problems

The integration of
science and local
knowledge is
important in
finding the best
solutions.

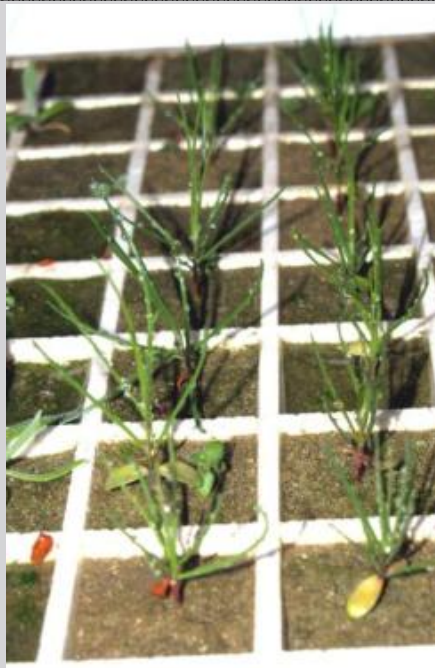
Synergies enable
us to find
solutions to
complex problems



PAR

Exploring the propagation of wild rooibos as an adaptation strategy

(Greenhouse and farm nursery)



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Reducing use of fossil fuels

Solar power at the Heiveld tea court for water pumping, lighting and power tools



Conclusions

- Adaptation is place based and requires specific strategies
- In order to create an enabling environment for adaptation it is important to avoid fatalism and to foster enthusiasm to adapt, and to create co-operation and networks to foster adaptation processes
- The participatory action research process and the development of local and national networks has contributed towards creating a more enabling environment for adaptation in the Suid Bokkeveld.
- Ownership of the adaptation process fosters enthusiasm, pride and self-sufficiency, and contributes to resilience

A close-up photograph of a longhorn beetle (Cerambycidae) perched on a large, vibrant green leaf. The beetle's long, segmented antennae extend across the leaf. In the foreground, several purple flowers with white and black markings on their centers are in bloom. The background shows a mix of green foliage and brown soil.

Thank you for
your attention