

*Original Paper*

A Preliminary Degradation Pathology of Rangeland Declines  
Near Opuwo in the Kunene, Namibia: The Tragedy of  
Disrupting Traditional Commons Management

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**Abstract**

*The Kunene in far north-western Namibia is widely recognised as having amongst the most widely and severely degraded rangelands (de Klerk, 2004; Joubert et al., 2008), yet this was not always the case. In many communal areas, major episodes of degradation have only occurred for the first time in recent decades. The degradation is not many decades old and yet it is seen as obvious support for the concept of the tragedy of the commons (Hardin, 1968). This simplistic, convenient interpretation of change is strongly dissonant with what I have observed first hand. What has gone wrong and can this inform us about rangeland rehydration and repair? I draw on experiences from a small number of communities with whom I worked and learnt to piece together what has gone wrong. I also suggest cause for optimism of rangeland revival in the Kunene when the fundamental, root causes are addressed with clear community ownership and leadership based on local, people-centred problem solving. The major challenges are cultural, social, administrative and perhaps economic. They are not lack of knowledge regarding scientific rangeland management although the latter needs adaptive attention in a new, socially engineered human context.*

**Keywords**

*aid, degradation, development, empowerment, social engineering, sustainability*

**1. Introduction**

Much of the Kunene near Opuwo is hilly with valleys, swamps and pans that are vulnerable to accelerated (human-driven) landscape incision. This predisposition to landscape incision is not the fundamental cause, it merely exacerbates problems. There is strong oral evidence that the land was

once covered by perennial grasses and gullies (“dongas” locally) were relatively rare and small if ever existing in an area and did not expand. Many people recall better times and are quite clear about what went wrong. It would appear that the obvious and often acute ecosystem and natural resource issues reflect major shifts away from longstanding (a few thousand years) land management deeply rooted in land culture (Bollig & Gewald, 2000). These changes are modern; they appear more closely correlated to the arrival of Europeans and their technologies and associated experts which will be discussed.

This raises important questions regarding the way forward in an already transformed social context. Is there time for cultural realignment of communities to use new technologies and opportunities or has too much changed and is massive transformation required simply to support viable rural Kunene people? Can the technical disciplines whose influence brought about such massive degradation and cultural dislocation steer the transformative process? Or do we need new ethical partnerships with additional key social disciplines at the forefront of their development and a redefinition of development? This is a truly wicked problem in Kunene.

### *1.1 The Pre-Development Situation*

The Herero and Himba people have inhabited much of Kunene for about two thousand years. They practised a semi-nomadic lifestyle based around permanent villages and seasonal outstations, areas to which most people and livestock moved in good seasons. These areas often had ephemeral natural surface water sources in the form of pans, swamps and other local water ponding features. Livestock and people shared landscapes with wildlife which also had seasonal migratory patterns and it is possible that these influenced the development of sustainable rural habitation patterns by rural communities. Conjecturally, people followed the wildlife movements with success. The key factor was that natural vegetation palatable to livestock was allowed to recover from grazing on a regular, seasonal basis. Indeed, there is no clear evidence of major changes to vegetation a few thousand years ago when Ngumbi people first moved into the region from the north in large numbers (Bollig & Gewald, 2000; Bollig, 2006).

### *1.2 The Oudendaal Engineering and Post-Independence Aid*

Under the South African apartheid administration, Oudendaal was charged with developing tribally based land use plans for Namibia and associated development initiatives. He lodged his final report and plan in 1964 and it was implemented forthwith. This was clearly a politically motivated, perhaps cynical initiative and the focus of this article is on the outcomes, not the motivations and politics. What happened is that boreholes were drilled and equipped, roads were made and a major shift occurred in how rural populations lived. The liberation struggle was intertwined in these development initiatives. The quotation marks are deliberate; development means realising potential according to the Oxford Dictionary. What resulted was more damaging to potential than the realising of it. After Independence, many foreign aid organisations came to Namibia to help develop a new country’s potential for its mostly disadvantaged people. They were well-intentioned, and this may have exacerbated the problematic social engineering of the previous apartheid regime by furthering the social engineering

away from traditional land culture that had stood the test of time.

While it is easy to be critical of previous aid programmes, this should be limited to learning lessons and not repeating mistakes. In most cases, the aid was very well-intentioned and can be very usefully and sustainably managed if power relations are attended to. Ultimately it is the local landholders who account daily for their land management, if they are empowered to do so and not taught management best practices (Freire, 1972; Ison & Russell, 2000).

### *1.3 The Manifestation of the Decline*

The provision of permanent watering points and roads broke up the traditional transient lifestyles as permanent villages established at previously seasonal outstations and the pendular seasonal migrations from previous major villages declined. Thus migratory herding declined and more laissez-faire livestock management resulted around new bores. The critical recovery periods for palatable perennial plants thus disappeared with the traditional transient lifestyle, to be replaced by plant species adapted to continuous heavy grazing (Purvis, 1986; Savory & Butterfield, 1999; Fynn Kirkman et al., 2017) and drying landscapes (Tinley, 1982; Pringle et al., 2011) and bare ground. Cattle paths typically followed valley floors and along with wagon tracks and then car tracks, provided the nick point initials (Pringle & Tinley, 2003; Pringle et al., 2011) for massive intensification of landscape change—an explosion of donga (gully) development. This narrative has been repeated to us too consistently for it to be pure conjecture and is obvious in any drainage system with active surface flow and some relief. A real, urgent challenge is to identify and protect viable remnant seasonally inundated areas.

### *1.4 Preceding Work*

Conservation Agriculture Namibia (CAN), previously part of Integrated Rural Development and Nature Conservation (IRDNC) bases its approach to development around the Holistic Management's framework (Savory & Butterfield, 1999). This approach involves what might best be described as inside out planning; facilitators support communities to articulate their vision and goals and then how to pursue them. This approach does not pre-judge the requirements of communities within a region and plans are developed from the grassroots upwards (Adams, 1987). This holistic approach requires a deep understanding of current cultural land management and specific attention to potential negative consequences. CAN led the Erora community through a situation analysis and then supported them in developing solutions that addressed the root causes, which are discussed below.

I first visited Erora in 2011 and added value to the existing programme by assessing, with the community, the physical landscape succession processes and their history and causes. This was the start of the partnership between CAN, Polytechnic of Namibia (PoN) (now Namibia University for Science and Technology-NUST) and Ecosystem Management Understanding (EMU)<sup>TM</sup> and the precursor to Southern African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL) Task 41 Landscape Literacy (Pringle et al., 2011).

## 2. Methodology

The key principle of the EMU approach is to be courteously inquisitive while still challenging and to develop a strong bond with the community based on reciprocal respect. The broad approach is encapsulated in documents (Tinley, 1986; Tinley & Pringle, 2014) as well as videos (see <https://vimeo.com/channels/emulandrecovery>). In essence EMU goes through a process of engagement and relationship building followed by a community led, on ground, baseline assessment of the key issues raised in first meetings. Then we plan what needs to change to address challenges and opportunities and how we can make these changes. From then we repeatedly review our efforts against objectives to date and decide whether to focus on repairing or changing our previous efforts or addressing new issues and areas. Importantly, we live in the community when we are there and talk over campfires, sometimes long into the night. This is the narrative below.

## 3. Results

### 3.1 Erora Community

#### 3.1.1 The Initial Community-Based Situation Assessment at Erora

The Erora community had already made it clear to IRDNC-Agriculture staff that the palatable perennial grass species would complain about how they were being treated if they could talk and that lack of recovery periods was a key problem they would have identified. They also agreed that unified herding with a grazing plan was probably the best way to provide recovery periods and address soil capping. Herding is based around three main boreholes (two installed through the project and one during the apartheid era and a small dam. The combined herding worked so well that Erora attracted neighboring cattle from the north and south, which created problems in assuring adequate recovery as the herd moved away from particular grazing zones. There was even concern that the litter layer was so thick it was limiting soil infiltration after light rainfall events. It was working well.

The incursion of neighboring livestock raises complex social issues as there is sympathy for the people who do not manage their grass well. Putting up fences is one solution, but will it also possibly put up social and cultural fences? Perhaps a better solution is for capacity building to spread from nodes like Erora on the basis of the evidence. Livestock may stay on their own area by choice. The neighboring cattle have voted with their feet.

It is not all roses at Erora; many really poor rainy seasons have left the land dry and group herding has ceased as cattle have been sent elsewhere or herded more loosely by individual farmers to give them the best chance of survival. They have recently agreed to keep their individual herds in the same areas and still rotate them around the bores. This highlights the problem of segmenting traditional areas and losing the flexibility to move.

The farmers and community leaders are adamant that they will restart group herding as soon as it is practical to do so. They are convinced that the animal production and rangeland health benefits of group herding are worth the effort, cost and complexity of collaborative, shifting livestock

management.

When I asked the Erora Headman Katurikuare why the land next to Erora was so sick he shook his head looking down and then looked up and said; They have no grazing plan. That was totally unsolicited and indicates the extent to which the Erora community own their grazing plan, supported by CAN.

### 3.1.2 The Erora Community's Assessment of Physical Landscape Succession

At the end of an initial working week with IRDNC staff member Nelson Ruhumba and herders, I asked if a meeting with the community elders was possible and this was facilitated by Uhangetenua Kapi and Dave Kangombe from IRDNC Agriculture. The elders explained that they had abandoned some fields because the river grew back through the valley floor and then broke out into old wagon tracks, cattle paths and other cuts in the landscape. They offered to show where it had got to now and after the meeting we visited, photographed and took GPS waypoints at the gully heads. The landscape succession they narrated resonated quite precisely with the field evidence.

The elders also indicated that the original Central Bore's water level was gradually dropping and they saw this as the result of the dongas (gullies) and lack of grass cover leading to less recharge. It eventually failed. The upslope areas of Central Bore is where they asked us to start slowing and spreading channelled flows. Unfortunately, water levels in the bore were not recorded prior to the start of the restoration works, but the community has stated that despite poor rains, the water levels have risen because of our work together. The bore no longer dries up after heavy use and can be used every day.

Not only did the Erora community know what had gone wrong with the veld condition, they also exhibited a detailed knowledge of physical landscape succession processes. They did not need to be told, rather they needed to be listened to and helped in building viable holistic solutions.

### 3.1.3 Summary Interpretation of What Went Wrong at Erora

Clearly the breakdown of seasonal migratory herding—and more specifically wet seasonal migrations south to the Erora area away from Otjerunda—has impacted severely on both Otjerunda and Erora. This was enabled by apartheid Government installation of a productive bore during the Liberation War (late 1970s). Neither areas have received recovery periods from grazing and livestock numbers appear to have increased as Himba people also brought their cattle and goats to live at Erora permanently. As grass cover and infiltration declined, run-off increased and found nickpoint incisions—often animal paths and road—and the intensification of landscape incision and declining grass cover without any recovery periods became a downward spiralling feedback loop (Pringle et al., 2011). Undoubtedly, free ranging cattle from a permanent watering point were instrumental in creating the nick points (cattle paths).

### 3.1.4 The Rangeland Rehydration Works at Erora in 2015

- ◆ A total of 678 filters applied
- ◆ Approximately 11 gullies + limbs treated

- ◆ Six confluences treated
- ◆ Three gully heads treated
- ◆ 11 suspended filters
- ◆ 667 ground filters
- ◆ One log filter
- ◆ Two rock filters
- ◆ Four diversion filters.

Much more work has been done since then because the community sees the benefit and they rated it the top of activities to continue in the 10 year IRDNC/CAN review facilitated by Dave Kangombe and Usiel Kandjii.

### *3.2 Otjitunganane Community*

#### *3.2.1 The Initial Community-Based Situation Assessment at Otjitunganane*

What differed to Erora was how comparably recent were the major changes that had occurred. One elderly man recounted how an important pan that held water long into the dry season was now just a sandy creek bed (a gully). The pan was unplugged by a major flood in the last few years, but had supported livestock and people before. The pan was the core watering point that determined when the villagers could move south from Okorosave and when they needed to return north. The villagers recounted how the channels are growing and spreading and wanted to know if this could be stopped. They also acknowledged that the problems started when permanent settlement occurred and they stopped returning to Okorosave base village every dry season. They also said that the problem was accelerating and that they needed to do something about it or it would get much worse.

There was general agreement that continuous, uncontrolled grazing based around water points was a major cause of the problem and that combined herding was the only way forward to allow adequate recovery periods.

#### *3.2.2 Initial Ecological Assessment of Otjitunganane*

The first borehole was established in the early 1990s after Independence and was augmented by a less useful bore in 2012. Thus, this area has only been settled and continuously grazed for about twenty years. That said, many people in the scattered housing clusters have come from elsewhere to take advantage of fresh country and permanent water. This is not simply a case of splitting up people and herds from Okorosave and the breakdown of broad scale, pendular, seasonal migrations; it is also a case of increased human and livestock stocking rate.

Uhangetenua Kapi led us around the Grazing Area and we also visited some areas based on assessing Google Earth imagery. It was obvious that the severe degradation was recent, most obvious by the improving situation as we travelled up the main valley away from the bores. The severity of degradation was clearly linked to increasing drainage intensity (donga formation) and the upper valley is least affected as one might predict (Pringle & Tinley, 2003). This is because the upper valley is both furthest from watering points (Pringle & Landsberg, 2004) and also last to experience cascading head

cutting (Pringle et al., 2011).

The valley floor drainage path and associated intermittent ephemeral wetlands are being unplugged by cascading and dividing gully head cutting. The sloping pediments are being encroached by *Acacia mellifera* (swarthuk), while the valley floors that are no longer seasonally inundated due to donga drainage are being invaded by *Acacia karoo* (Tinley, 1982). The trajectory is towards bush encroachment with a major decline in production and simplified domination by a few different encroachment species. With a succession to dominance by woody plants and the decline of the grass layer, the land is increasingly less able to support grazers and potentially more able to support browsers. That is coupled with a general decline in primary productivity, so merely adapting to different dominant forage type is not really a long term solution. The rain use efficiency will continue to decline in an area of Namibia that most needs climate adaptability.

### 3.2.3 Commenced Restoration work at Otjitunganane

We have identified some key intervention sites and considerable attention is being paid to halting incision that will unplug healthy valley floors and their ephemeral wetlands. We will also filter the bottom ends of breached wetlands and help them reform. Finally, we will filter all critical control points to calm the whole drainage ecosystem (Tinley & Pringle, 2006). As at Erora, we use what is locally available so that the restoration could be done anywhere in the Kunene and beyond, where there is the will. Steel wire and standard posts are the materials we have to access, as well as axes, cutlasses (pangas) files and gloves. Knowledge and experience are already being built and endogenous innovation is evident. This innovation includes better techniques to tighten wire from which to hang bushes (suspension filters) and improved design of anchor poles that will hold suspension filters during strong flows when a large tree is not present for this anchoring. We have installed:

- ◆ 13 ground filters
- ◆ 57 suspension filters,
- ◆ there are also live filters where low trees have been pushed over but left viably rooted. It is not known exactly how many were created.

More work has been done since the project funding ceased and pendular grazing has been recommenced.

### 3.2.4 The Landscape Literacy Workshop at Otjitunganane

In March 2015, we held a workshop on landscape literacy at Otjitunganane that was well attended by the Grazing Area and villagers from Erora and Otjitunganane, as well as a local Ministry of Agriculture, Water and Forestry officer and two IRDNC staff. At the workshop we explored causes of degradation and the differences between healthy and degraded rangelands across the supply chain from raindrops to market prices. We then assessed the major valley system of Otjitunganane and thanks to the generous welcome for input from Otjitunganane elders, came up with an assessment of the area. The key points were:

- 1) Paths from free ranging cattle are providing the nick points for dongas

- 2) Roads are increasingly becoming rivers and need to be closed down and replanned to fit the landscape
- 3) Without grazing recovery periods the land degradation will accelerate - the cattle need to go now
- 4) Group herding is the best way of managing where and for how long grazing impacts occur
- 5) Filters should use bush encroachment species to save intact pans and restore the valley system.

### *3.3 Omuuandjai/Ombombo Community: A Compelling Contrast*

This community was only visited once by HP, but his colleagues knew the community members and some are relatives. We chose this community because they seemed to have weathered the drought considerably better than most others. One of the most senior community representatives and members of his family were interviewed at length. They agreed that they were surviving the drought better than many others and put this down to the fact that they still adhered to ancestral land management knowledge and systems. They still practise pendular dry/wet season grazing despite having a bore for some decades. There has been resistance to pendular movements at times but as most community members are born within the community culture, to date they have always managed to persuade dissenters of the need to maintain traditional practices. Part of this success is that they have very tight restrictions on immigration to their community lands; people seeking temporary relief are only taken in on the firm basis that they must leave when seasons improve in their traditional areas.

This strong cultural continuity and governance appears to us and those who we interviewed to be critical and to varying degrees has not been as strong in the previous case studies and beyond. Part of this cultural continuity is group discussion and planning so that it becomes clear what the majority want, but also that the majority demonstrate that they want the dissenters to stay with them. For potential dissenters who have grown up in this close community, the cost of going it alone has always proved too great for them to do so.

They tried group herding for a short while with IRDNC, but it coincided with poor seasons and got off to a bad start with simmering social divisions so they reverted to family-focused pendular grazing (together). They say they are unlikely to revert to group herding and that some areas under group herding have little grass compared to them.

Asked whether everything was fine and there were no major problems the responses were clear:

- 1) The rain doesn't go into the soil like it used to do due to excessive stocking rates and spreading dongas (gullies);
- 2) Ombombo lacks adequate recovery time and palatable perennial plants are declining while Omuuandjai (mainly grazed in the later wet/dry season and rested every wet season) is improving;
- 3) Dongas were not a problem when stocking rates were lower, cattle paths were not a problem and there were no cars and roads. Old roads are a big gully problem. Roads did not exist before Europeans arrived.

It was also explained that it is extremely difficult to control livestock numbers between family groups and poor prices also mean people are often reluctant to sell their stock before they lose condition.



Nothing has been done about dongas because there is no inherited ancestral knowledge. It appeared clear that there are cultural barriers to change even when the need to do so might be understood. Perhaps the best thing outsiders can do in support is to encourage discussion about the consequences of inaction. This approach has worked in the other case studies of this project and once this community decides to change it may prove to be as decisive and effective as anywhere due to the retained integrity of cultural processes.

#### 4. Discussion

We know from many discussions with elder community members that the Kunene rangelands near Opuwo were mostly open grasslands and savannah with healthy pans that held water for months to support people and their livestock and to allow base village pastures a chance to recover. This is a recurring narrative from our work. Traditional practices of land culture have been socially engineered out of existence to a large extent; sometimes cynically (i.e. the apartheid-era South African Government) and sometimes through benign ignorance by international funding organisations unaware of unintended consequences of their generosity. However the consequent degradation is relatively recent and in many cases can be halted and repaired (see [https://www.youtube.com/watch?v=6C4V\\_Cib8ts](https://www.youtube.com/watch?v=6C4V_Cib8ts)).

One debilitating result of this dismantling of traditional land culture by social engineering is the donga (gully) development which has no reference in traditional, inter-generational knowledge exchange. There appears to be no recorded knowledge about gully dynamics and treatment but rather a reluctant acceptance that this is part of “development”.

A triage approach is required to save what key drought buffering landscapes and wetlands remain. More important than this critical scientific process, is a people-centred capacity building and empowerment process such as Ecosystem Management Understanding (EMU)<sup>TM</sup> (Tinley & Pringle, 2014; Tinley & Pringle, 2014). The diagnosis and solutions for particular areas must be endogenous and not parachuted in by experts. That requires support staff who are better at listening than talking and prescribing—Respect for, and some understanding of, local land culture is critical, including being able to speak the local language at least rudimentarily and demonstrating a commitment to learn more helps. This demonstrates a commitment to fit in with and build local knowledge (Maturana, 1988), rather than teach people about their own land as is still taught at too many universities. Instead we need to build knowledge’s working together.

As traditional migratory practices and arrangements decline and social division accelerates, these issues will only increase. Turning back the clock is now clearly not a practical solution; it is impossible. New thinking is needed, built endogenously with external support focused on building capacity and local land leadership and governance within an enabling environment rather than parachuted leadership and prescriptions. It will need to be adaptive to the new socially engineered setting, but can use remaining land culture and knowledge and even claw back some lost land culture.

It is important that Hardin's Tragedy of the Commons perspective does not cloud the reality of what has changed and how a way forward can be chartered with communal lands. It is not communal land *per se* that accounts for widespread degradation (Vetter et al., 2006), but rather the social engineering that has undercut its very foundations (Bollig & Gewald, 2000). Degradation in communal lands is not inevitable in Namibia (Ward and collaborative grazing management seems to be the key to allowing productive grazing followed by adequate recovery periods as was traditional (Savory & Butterfield, 1999; Bollig, 2006; Fynn et al., 2017).

However, if raindrops are quickly entrained in ever expanding, incised drainage networks, then grazing management will only have severely restricted soil moisture regimes (Greene et al., 1994; Pringle et al., 2011) with which to repair degradation. This seems obvious to the communities with whom I have worked as they have continued to undertake rehydration works long after the external funding ceased.

The communities with whom my colleagues and I worked also understand the need for pasture recovery periods, but these are far more difficult to co-ordinate and enforce. The first challenge is to get cohesive commitment to group herding and as long as some stock are left behind for daily milk production, it is quite tractable. The externalities are not always controllable. At one of the communities, all of the livestock had been moved to another place and then a previous inhabitant from near Sesfontein brought all of his cattle to keep them alive and destroyed any recovery. The community were irate but chose not to report the issue. We also aborted a prospective project where a family group settled at a bore and refused to participate in the group commitment to rotational grazing.

In this new context, the market can play a positive or negative role. Infrastructural development and the capacity to produce more livestock product have not made marketing more attractive. Rather, they appear to have supported important cultural values. The cultural importance of owning large numbers of livestock at a household level is now part of the problem and is long recognised (Herskovits, 1926; Sandford, 1983) and yet overlooked in "development" aid programmes. The alignment of traditional values of caring for the land and having healthy livestock and communities is possibly the way forward.

Accepting that many of the impacts of social engineering are largely irreversible, then is the challenge to support cultural adaptation and not to replace tradition with parachuted paradigms developed without the extraordinary knowledge and wisdom of traditional land cultures?

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