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‘Water Used to be Scattered in the Landscape’: Local Understandings of Soil Erosion and Land Use Planning in Southern Zimbabwe.¹

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SUMMARY

This article presents some local understandings of ecological history in a semi-arid area of Zimbabwe as an exploration of how changes in land use that reflect both local initiative and state planning have transformed the hydrology of local catchments of heavy clay ‘mopani soils’ and greatly accelerated soil erosion. Local explanations provide a wide-ranging and challenging analysis of the dynamics of watersheds situated within a complex social and historical context. In conjunction with the spread of ox-ploughing and population growth and redistribution, a range of ill-conceived and authoritarian ‘conservation’ and ‘development’ interventions by the colonial state are argued by local intellectuals to be the major causes of accelerated soil erosion. Particular attention is given to how government imposed the deforestation and intensive use of difficult top land soils, and then transformed that uneven heterogeneous landscape into a smooth bare land connected by contour ridges and paths so that water concentrates, erodes, and then leaves the desiccating land to silt the rivers. The existence of sophisticated ‘indigenous knowledge’ systems in Africa has now been widely accepted, but this case study suggests that their very depth, variability and complexity means that attempts to harness local ecological knowledge for the understanding of – or development action about – environmental change may be more problematic than is often assumed. Researchers, government and conservation and development organisations need to do much more than seek to ‘tap’ such knowledge. Real understandings and ‘sustainable development’ can only flow from new power relationships with rural people and their knowledge.

INTRODUCTION: 'THIS PLACE WAS ONLY EVER INTENDED FOR WILD ANIMALS'

Mazvihwa is a semi-arid area of heavy red soils in Zvishavane District of south central Zimbabwe. During the nineteenth century it was not settled, but was used for hunting, gathering and transhumant cattle grazing.² Such unoccupied clay-rich plains with their mopani forests – known as *deve* – were a major feature of the social geography of the time.³ Settlement of the *deve* across southern Zimbabwe began after colonial conquest at the turn of the century, but the majority of Mazvihwa's present population moved there between 1920 and 1950 following evictions by white ranchers who were under growing pressure from the state to switch from taxing their African tenants to developing commercial agriculture. Other arrivals in Mazvihwa had left overcrowded native reserves that had been designated in areas of poor and overworked sandy soils, and sought new opportunities on the resource frontier. Many were attracted by the strong red soils, though they were fully aware that these soils were difficult to manage in such a dry area.⁴ At that time, Mazvihwa remained 'Crown Land' awaiting allocation to white ranchers, but after several threatened evictions the population was finally allowed to remain.⁵

These hot dry plains with their clay rich soils pose real challenges to farmers. 'This place was only ever intended for wild animals' muttered local elder Mr Gwatibvunza in 1987, as he reflected during this research on yet another drought and loss of the fifth harvest in six years. His father, VaGudo was a skilled hunter who led the first group of people down into the *deve* in the period of population dispersal which followed colonial conquest. At this time, people moved out of the defensive hill top villages run by petty chiefs and war lords in search of new lands and greater independence. Ruling lineages tried to control this process, and establish wide geographic boundaries to the chieftaincies the colonial authorities were now defining, and as Mr Jokonya explained: 'VaGudo was sent out to guard the border with BuShiri so that nobody could settle unnoticed'. Establishing the first of the large villages (*nzanga*) where stock could be protected from wild animals, VaGudo used to hunt the lion and other game of the *deve* using spears and arrows, the government having confiscated all the guns after the 1896 rebellion. African settlement was however facilitated in the 1920s when a white settler used part of the area to graze cattle, and under a government programme shot and poisoned the lions and other large carnivores. It is thus within living memory that Mazvihwa has been transformed from a wilderness frontier to an eroded and heavily populated area experiencing severe natural resource stresses.

A LOCAL ENVIRONMENTALIST INTELLECTUAL

Mr Chibidi is renowned in Mazvihwa for his environmental knowledge and attempts to control soil erosion. Chibidi would never talk about it in his home,

and always insisted that our discussions were held whilst walking around the area. He exemplifies the local intellectuals whose views are collated in this article: intensely analytical but with encyclopedic knowledge from empirical observation. He like others is also highly practical. Back in 1985 when this research was done Mr Chibidi had long been blocking incipient gullies with brushwood, though he complained that women removed it to use as firewood: 'Women can never care for an area because they are just outsiders brought in as wives'.⁶ More recently Mr Chibidi has been a key player in many community-wide and highly successful gully control projects in which women were key and enthusiastic players.

Mr Chibidi's explanation for increasing erosion was based on the effects of declining grass cover, caused by the reduced and changing distribution of rainfall, which recently had come in fewer, heavier storms. 'Big drops hit the ground hard and run away.... If you dig you find that the rain has only entered the surface', he explains. Less infiltration meant less vegetation and enhanced soil erosion. He refused to accept that soil erosion had resulted from over-grazing caused by the holding of too many livestock, which was the usual explanation in contemporary official discourse. As he stated baldly: 'we have fewer cattle these days but the grass has continued to get less and less'. Indeed, as Mr Chibidi and others were fond of pointing out, prior to the expansion of the railway and motorised transport thousands of transport oxen owned by white businessmen were left in the *deve* of Mazvihwa to fatten up in between journeys.⁷ Furthermore, according to the late Chikombeka, white settlers also used to cut grass in the area for sale in mining compounds,⁸ and for feeding dairy cattle on a neighbouring ranch.

Mr Chibidi situated his positive feedback 'declining rainfall, reduced infiltration' explanation within the context of vegetation dynamics. Heavy grazing does not stop grass seeding, he emphasised. Even in the severe drought of 1986-7, he demonstrated to a team of visiting ecologists from the University of Zimbabwe that the grasses were still flowering. For Mr Chibidi, poor grass cover reflected a failure of the seeds to germinate in hard, dry soil, with wind and rain carrying the seeds away because the ground is bare.⁹

DECLINING RAINFALL AND OVERGRAZING

People in Mazvihwa continually discussed the problem of declining rainfall. It constituted the most critical constraint on livelihoods, according to 85% of a survey of 68 people interviewed in 1987.¹⁰ Three quarters of these attributed declining rainfall to a failure to follow rain-making traditions and associated resource use regulations, reflecting an erosion of local control over resources due to Rhodesian land use planning and a linked politicisation and competition over resources between lineage factions.¹¹ Deforestation was also held to be an important cause of declining rainfall, reflecting not only agricultural settlement

but also extensive logging for the nearby Shabani asbestos mines, especially between the turn of the century and the mid-1930s, which has had a lasting impact on woodland structure and species composition.¹²

Most people turned any discussion of declining grass cover into a discussion of declining rainfall. They did not accept my analysis of records from local meteorological stations which showed that there had been no such decline.¹³ A decline in rainfall fitted with the expectation of community elders that such would be the impact of the desecration of the land by European encroachment, and meshed with complex debates about the nature of social change in the area. But despite the emphasis in formal discussions on rainfall decline, many rural intellectuals believe that reduced infiltration of existing rainfall is just as important due to the changes in land use that will be described below.

The emphasis on declining rainfall as a cause of reduced forage was of course in part a political strategy, a tactic in their on-going battles with government to avoid attributing the reduced grass cover that obsesses government officials to the high stocking levels of cattle and goats. People are not prepared to de-stock, a policy forced on them several times between the 1940s and 1960s, because cattle are required for basic economic survival which requires draught power for ploughing amongst other benefits. People also usually argued that declining grass cover on the clayveld was not critical in economic terms.¹⁴ Stock survive by concentrating on browsing certain tree species, feeding in and around fields, and on small areas of high fodder production around drainage sinks and river banks. This may help to explain why people expressed more concern about the degradation of these high value areas than they did about the desert-like toplands. The changes associated with soil erosion on top land in wider ecological rather than livestock economic terms, however, may be considerable, as is discussed below.¹⁵

OF TREES AND SOILS

During the early colonial period, shifting cultivation replaced the pre-colonial intensive wetland farming in areas of sandy soils in the hills surrounding the *deve* of Mazvihwa. A key feature of this new system was that chiefs obliged farmers to leave certain species of trees in their fields because they maintained soil organic matter and reduced erosion in the interests of the community at large in the longer term.¹⁶ These sandy soils were not farmed to the point of exhaustion when they would be easily eroded, but were fallowed after about five years, and the large trees that had survived the period of farming remained to complement the growth of new trees that brought recovery of the land. On the hard clay soils, in contrast, shifting cultivation was not practised and fewer trees were retained in fields because they competed with crops for soil moisture without providing a comparable fertility benefit for soils already rich in nutrients. When the work

of removing the stumps was considered too great, the coppice re-growth could be cut annually.

Early government extension encouraged farmers to remove completely all the trees from their fields, which created problems when they were abandoned. Erosion thus became concentrated in the areas of old fields where the trees had been removed and did not quickly re-establish themselves, because, in the words of Mr Mambudzi: ‘it is the bareness and looseness of the worked out soil that now lacks crumb structure (*mapundu*) which is causing this phenomenon of drainage development which we are so concerned about’.

Government attempts to improve grass cover in the grazing areas by removing trees and bushes (to deal with what it calls the ‘menace of bush encroachment’) have been opposed in Mazvihwa.¹⁷ Councillor Bwoni recalled how a colonial official had once tried to force people to kill by ring-barking *Acacia* trees in the grazing area to improve the grass. Mr Chibidi distinguished himself in that successful resistance campaign. Of course, Mr Bwoni, like everyone else in Mazvihwa, knows perfectly well that removing such trees increases grass growth. ‘It’s just like weeding’, Magwidi once told me. But the Mazvihwa community maintain that the total value of woodland including browse and soil conservation, out-weighs the benefit of increased grass cover.¹⁸ Mr C.G. Mukamuri recalls that people also argued that removing the trees where there is heavy grazing tends to increase harvester termite populations, which in turn consume more of the grass, decimating dry season grazing, a factor recently confirmed in ecological studies.

‘WATER USED TO BE SCATTERED IN THE LANDSCAPE’

During the 1920s and 1930s intensive hoe cultivation was largely replaced by ox-ploughing in Mazvihwa. Ox-ploughs were unknown in pre-colonial Zimbabwe, and were introduced by African migrants from South Africa, missionaries and private traders, diffusing rapidly because of their labour saving capacities, especially in flatter areas with heavier soils. The adoption of ploughing had marked effects on the movement of water and soil in the fields. Mr Chikombeka explained how ploughing had led to the development of rapid, unitary drainage systems, concluding: ‘Water used to be scattered in the landscape; now it is concentrated and flows to the rivers’. Mr Magwidi described how ploughs move soil, filling in minor depressions and sinks that had once accumulated water, checking its flow. These depressions had, before the plough’s effects, supported dense vegetation and hence were capable of preventing erosion when there was heavy rain. Termites, burrowing animals, trees and wallowing elephants all helped to create this unevenness over the centuries: old field areas did not achieve it again quickly.

Solomon Manhivi, an elder of an outsider lineage, had a group of sacred pans

(*manawa*) on his land, shallow swampy pools which used to hold run-off virtually to the end of the following dry season, 'when the little creatures sing for rain'. 'The place is very important to us' he emphasised. However, these pans were farmed and hence somewhat levelled during the 1982-4 drought by a man who left the area for northern Zimbabwe thereafter. 'We could not stop him', Manhivi explained 'as he was from the chiefly lineage who claim everything belongs to them'.¹⁹ According to Manhivi, this area also suffered from siltation due to increased run-off from neighbouring areas, this encouraging in turn, the development of gullies in the area, and the increased rate of run-off contributed to a reduction in infiltration.

Mr Nhongo and the late Mr Magaya were among the farmers who favoured ploughing down slope, as they used to do when they first opened Mazvihwa's non-riverine land. Although they may have taken this controversial position for the purpose of amusing argumentation – the height of good manners in Mazvihwa – the benefits and disadvantages of down slope ploughing require consideration and depend on soil type amongst other factors. People in Mazvihwa favour cross-slope ploughing in some contexts, such that, in contrast to fields on the uplands, the alluvial fields (*majeke*), were always ploughed parallel to the river, a fact clearly visible on aerial photographs from 1939. The argument against cross-slope ploughing on dry land fields is that 'water collects at one place, and when it gets an outlet it will do so with great force'. Mr Magwidi, a skilled farmer, claimed that ploughing down slope avoided the accumulation of water and hence the risk of dramatic gully erosion, though overall more water was lost from the field. Before contour ridges were introduced, however, farmers used to leave small bunds (*mivombo*) at intervals down the slope to prevent such flowing water building up in fields.

PLANNING, LIVING IN LINES AND FARMING WATERSHEDS

The land use plans imposed by the government across the African farming areas of Zimbabwe define the broad watershed toplands as arable blocks, and the kopje hills and riverine areas as grazing. Though people had opened up Mazvihwa around its margins by farming riverine alluvial soils, this was outlawed by the government and suppressed in the 1930s and 1940s. The authorities claimed that this was an inefficient and environmentally unsustainable system of land use, ignoring the fact that these were thriving communities by the late 1920s. The records of the Dadaya mission, for example, confirm oral historical accounts when they describe substantial riverine populations at Gudo (June 1926, July 1927), Gwen'ombe (early 1928), and Mototi (October 1928), which was described in November 1928 as a 'thickly populated area ... eight miles south of Gudo on the Lundi river'.²⁰ Although by 1939 the aerial photographs indicate that there was intense pressure on prime riverine land, sufficient land for farming

could still be found in the vicinity of the rivers, with the vast interior available for hunting, grazing and gathering to supplement the riverine fishery. It was the absence of intensive and permanent exploitation of the *deve* toplands that was key to the sustainability of the system as a whole.

Although the *deve* of Mazvihwa had only been recently settled, other areas of similar ‘mopani veld’ in southern Zimbabwe had long been successfully settled in an essentially similar manner. The Hlengwe, for example, further down the Lundi river, combined a similar system of intense farming of alluvial areas and the harvesting of the considerable wild resources of the interior, until they too lost much of their land to ranchers, and were stopped from hunting and wet land farming.²¹ Whilst it should not be thought that prior to land use planning such people lived in harmony with their environment, there is no doubt that things were vastly superior than after state intervention. Ironically, the nonsense of Rhodesian centralisation for such areas was recognised in the Natural Resource Board enquiry into African land use which laid the basis for much of it, as illustrated by the following exchange in 1942:

Mr Benzies: We went through mopani veld and I believe it is proposed to centralise that as well; you can’t centralise mopani veld. There is practically no grass at all and in winter the cattle feed on leaves.

Dr Pole Evans: I would like to support what Mr Benzies has said with regard to mopani veld. The country has been heavily punished (it is very badly eroded) and I certainly think – in fact I know – that it is country in which you cannot put any permanent settlement. It is country that should be protected and opened for grazing in the winter months only and probably once in five years or something like that.²²

Although fixated on the grazing, whilst African communities had a much greater variety of resource utilisation strategies, even government specialists thus recognised that such areas were not suitable for villages and extensive arable cultivation. Yet when land use planning gathered momentum the ecological realities of mopani veld *deve* were swept aside.

Following the draconian Native Land Husbandry Act (1951) there were intensified efforts to impose land use plans, but given the extent of the project, the limited capacity of government bodies and the extent of opposition, large areas escaped the programme for some time. It was thus only during the drought of 1960 that the government capitalised on the hunger to push ‘centralisation’ of the area, combining food-for-work relief programmes with pressure for the relocation of villages and their farm lands.

After futile protests, Mazvihwa’s people were moved away from the rivers into straight linear settlements that would lie between the arable and grazing blocks. (To this day villages in Zimbabwe are called ‘lines’ in vernacular.) The watershed forest was cut down to create the new fields in exchange for grain. The memory is bitter. The government programme was seen as narrowly political,

with the 'lines' a symbolic and practical technique to control rural people.²³ Most people in Mazvihwa still wish to return to intensive farming in the riverine zones. Mr Magwidi, although an old man, once said wistfully that he 'would return to his old home and lands tomorrow' if the government were to change the legislation that bans farming within 30m from a water-course on the grounds that riverine farming causes erosion. The 'lines' remain an unpopular and a critical constraint to a flexible and ecologically sound pattern of settlement and land use.

I asked the late Mr Chikombeka how farming toplands rather than lowlands affected erosion. 'If I fall from where I'm sitting now, I won't hurt myself. But if I fall from the top of my house I will be bruised. Just the same is the effect of making people farm far from the rivers: the run-off builds up and has got power to erode, carrying a lot of soil'. As the fields that people had been forced to abandon had been ploughed smooth and partly destumped of trees, they too were more vulnerable to erosion. Thus government plans had inadvertently led to the exposure of bare soil – subsequently to be smoothed by ploughing – in a vulnerable position at the crest of the catchment.

'CONTOUR RIDGES KILLED THE LUNDI RIVER'

'The Lundi River has been killed by contour ridges' Mr Mudarikwa said gravely, expressing a commonly held view that the compulsory construction of contour ridges following centralisation had caused the siltation of their river and the collapse of the once substantial commercial fishery. Also important, claimed the fishermen, was up-stream damming that led to reduced flow with greater fluctuations, reducing the capacity of the river to wash away silt.

The late Mr Chikombeka fished the Lundi River for seventy years and gave a detailed history of the siltation of each and every pool along Mazvihwa's twenty kilometre stretch of this great river, a history that was hugely depressing because of the extent to which deep permanent pools were one by one silted up, but which clearly demonstrated that siltation had not occurred in an even manner. As fields were ridged in each area of the catchment, starting with Takavarasha on the left bank in 1947, there was a subsequent local increase in run-off, soil erosion, gullyng, drainage development and siltation in the tributaries and then the main river. According to Mr Mudarikwa and Mr Nhongo this was because contour ridges connected up a whole field and drained it into a single drainage line where it had the power to erode, especially during exceptionally heavy rainstorms. Indeed, according to Mr Chikombeka, 'contours are good for soil conservation within fields, but problems arise where they empty their water'.

Similar conclusions on how contour ridges concentrate water flows in a context where official zeal was only equalled by its incompetence, have emerged from research by soil scientist Mike Stocking. Stocking reports that across the country government soil conservation measures are not in fact correlated with

reduced erosion, with measures often proving locally counter-productive.²⁴ ‘In Mtoko TTL gullies on supposedly conserved land were as numerous as those on the more remote and un-conserved land. A bad contour ridge channels water to one point and the resulting erosion in an intense storm is worse than if no ridges had been constructed.’²⁵

‘CONTOURS WERE NO RESPECTERS OF AGE’

According to people in Mazvihwa the inherent weaknesses of contour ridging in soil conservation were amplified by the fact that they were constructed under forced labour, with sloppy pegging by an over-stretched extension service.²⁶ For the Rhodesian authorities contour ridges were one of an array of scientific fixes that had to be urgently imposed across the land in order to save the carrying capacity of the African Reserves. Thus soil conservation teams organised ‘campaigns’, moving frantically across the countryside imposing the ascendancy of the government over the land. Whilst the instrument of that ascendancy was the coerced labour of villagers, the Rhodesian technicians of the front line lacked the technical ability to lay out accurately the thousands of miles of ridges per year that were provided as programme targets.

‘People were resisting’, recalls Mr Magwidi of the campaign in Mazvihwa, ‘the trench adjacent to the ridge had to be big enough for a Land-rover to drive down. As we failed to dig them when ordered in 1960, police were sent in 1961 to watch us the whole day.’ The memory is still bitter. ‘Contours were no respecters of age’ one old man said of the humiliations of that time, when even the village elders were forced to dig the ridges. It is also said that the labour of cutting down the forest and digging the ridges resulted in an epidemic of pulmonary tuberculosis.

In this context of imposition local people were unable and/or unwilling to get the ridges laid out accurately. Thus the late Chikombeka lamented that ‘they would be less harmful if people had better knowledge of building them so as not to let water escape’. There was thus some catastrophic erosion in Mazvihwa in the seasons after the ridges were constructed. A similar process was recorded in Bikita by the otherwise enthusiastic land use planner Barry Floyd.²⁷ According to Floyd it was common for erosion to follow ridging, and in one example he records that: ‘loss of topsoil and even subsoil was enormous: the “skeleton” of the land in the form of parent rock lay exposed to the air. Contour banks accumulated silt to their maximum height before rupturing. Deep gullies were formed where storm waters came together on their down hill course.’

The resentment created by this coercive approach to conservation meant that government capacity for control collapsed during the liberation war in the run up to independence (1980). Thus in the view of Mr Mambudzi and of Saul Jim the most shocking increase in soil erosion and siltation came about when fields were

illegally extended into drainage lines in the 1970s. These extensions were one way in which people expressed freedom from the technocratic and authoritarian impositions of the Rhodesian era, in a movement known as the *madiro*. It took place at a time when land shortage had become a major problem due to population growth and the large fields that were needed to produce much on the dry toplands. Describing this period, the late Mr Magaya complained: ‘The people just ploughed the drains without realising that they should have joined the contour ridges to trap the water [spilling] from the contour into the drain, and this is the reason why the streams formed. People should have dug storm drains.’

‘PATHS WERE MANAGED AND USED TO ZIG-ZAG’

Some of the worst erosion problems in Mazvihwa are related to paths. ‘The reason for so many gullies today is what has happened to our paths’ was a common refrain. Paths are vulnerable to erosion because of bare, loosened soil, and because they act as channels gathering up water that flows across the slopes, especially in land that has been smoothed by ploughing and/or compacted by heavy grazing.²⁸ Some gullies in Mazvihwa are old government roads which were never protected.²⁹ Others formed along cattle tracks to dip tanks, as was also reported in the reports of contemporary administrators.³⁰ When dipping was first made compulsory in the late 1920s there were so few dip tanks that cattle had to trek long distances. There was also much controversy as to whether sleighs – wooden trays pulled by oxen or donkeys introduced around the 1920s – increased erosion, and hence whether the subsequent government ban was justified. Some people pointed out that they had to use something to transport goods and carry their ploughs where there was no proper road for a cart. It could also be argued that sleighs acted like ‘road graders’, levelling rather than cutting into the soil. However, others did see sleighs as an erosion threat, and in general, people who had access to carts tended to be anti-sleigh.

But the problem with paths was not only new technologies and pressures of movement. It was also the changing pattern of paths in the landscape. ‘In the old days, paths were carefully laid out. They used to zig-zag.’³¹ If one developed a gully it would be moved’ said Mr Chibidi. ‘People had a lot of knowledge about this’ he insisted. They fenced their homes with gates that would direct the movements of people. If a road was bad it would be stopped. Cases over this could be brought to a court, it was a crime... [just] as today we can punish the burning of large trees’. Mr Hove added ‘If a gully started they avoided using that section of the path. They simply told people not to, cutting a branch of *chitarara* [*Gardenia spatulifolia*], placing it across the old path. This tree has its laws... Then they pegged logs in the incipient gully and put in leaves to trap the sand so that the grass would grow.’ During field work in villages in the hills of Mazvihwa that had escaped centralisation it was often possible to see paths being managed in this fashion.

Centralisation and the ‘lines’ of linear villages ended all of this, Mr Chibidi continued. ‘The problems of concentrating people in one place came and came for good. Putting houses in lines led to straight roads, and big cattle paths developed down to the river ... you can’t cooperate in order to site the road ... it will go straight and wide in front of the houses.’ The loss of control of paths around homes had parallels within the arable areas. As Mr Chibidi put it, ‘With centralisation, paths were defined between the fields and sleighs and lots of people use them endlessly.... Also, people make their own short-cuts without thinking’. According to the land use plans, paths were supposed to be sited at the crests of the slopes, with the drainage lines unused along the bottoms. But this is not what happened. Paths developed in response to the actual routes people needed to follow: to schools, main roads, business centres and water sources. These rarely corresponded to the officially-defined paths. Short cuts through fields were the source of much dispute with field owners. Often paths were established straight up the drainage lines, and hence became prime sites for gullies. Mr Magwidi complained: ‘Contour ridges release water into drains ... these places would be grassy if they were not paths. But being as they are footpaths, the contour ridges increase gully formation.’

The erosion of paths has become so critical that it impedes movement. In fact quite a number of people who get drunk end up spending the rest of the night in the bottom of a gully encountered on the way home. For example, the self-styled Doctor Mackenzie interrupted an interview to show a wound on his leg sustained in this manner, and to offer his daughter in marriage in exchange for a bicycle so that he would not be tempted to use the short cut home through the gullies between the fields. Mr Nhongo, describing the interplay between contours and paths described above, insisted passionately that because of all this ‘contour ridges physically injure people’.

The issue of path erosion demonstrates the weakness of land use plans designed for African rural areas as if they are purely agricultural lands with no people living in them. The present land use plans make access very difficult, because arable blocks are large and distant from the linear villages. Furthermore, once government had coercively superimposed their own framework it undermined the capacity of rural people to work collectively to design and manage alternative path networks.

SOME IMPLICATIONS FOR ECOLOGICAL HISTORY AND FOR CONSERVATION

This paper seeks to create a sense of how an African community perceives and explains soil erosion in their area. The paper is a tapestry created from the varied opinions, observations and theoretical explanations from named individuals. It seeks to convey both an impression of lively intellectual enquiry where individuals have different interests and views and also, I hope, that there is some

commonality in the narrative and the explanations suggestive of a collective experience of complex changes in land use in interaction with specific and changing ecological realities. A series of arguments arise from such material that might be applied to both conservation thinking and planning and to researchers of ecological history.

The paper – and the author’s experience in researching it – cautions as well as enthuses an interest in African ‘indigenous knowledge’. Indigenous knowledge is not just an attractive mix of homilies to environmental harmony and lists of edible plants. To handle such material it is key to recognise the individuality of every piece of ‘information’ and the precise way in which social context including historical change shapes the articulation of ideas. Yet at the same time it is also key not to overlook or trivialise its underlying paradigms that can at times be deeply rooted and connected to wider values in profound ways not always easy to appreciate. Scraps of poorly comprehended ‘indigenous knowledge’ obtained through casual embrace – interviews through an interpreter that are then micro-analysed as text – or facts rapidly abstracted through the constraining and distorting protocols of ‘participatory rural appraisal’ – can never enable the comprehension of what are both ways of thinking and communicating and bodies of facts about a complex empirical reality.

Furthermore, the sophisticated nature of local ecological knowledge needs emphasis, in turn raising further cautions. Explanations for how land use planning and technical change in agricultural practise have interfaced with a complex environment suggest that attempts by social scientists – especially of more political economist persuasions – to ‘read off’ environmental causes and consequences from political relationships can bear little relationship to reality. Likewise the sheer scope of local thinking about erosion within whole catchments – with such concerns as the pattern of paths, soil compaction, local spatial heterogeneity and its drainage implications, and tree-soil dynamics – is awe-inspiring, and indeed alongside or ahead of the cutting edge work by ecologists and soil scientists. Thus given the complexity and detail of such local knowledge it can only be learned accurately by researchers over long periods of time, in the field (bush), and with field researchers able and prepared to learn the hard realities of soil textures, ploughing systems and the patterns of tree roots for themselves.

Given these cautions it should be more difficult to condemn Rhodesian land use planners and soil erosion engineers for failing to learn from the massively technically superior knowledge of the African farmers whose lives and lands they so damaged over half a century of intervention. It is also clear why it remains so difficult to write a history of people and their lands, let alone a truly ecological history. Yet surely it argues that there can be no excuse for Rhodesians or the Zimbabwean officials that have superseded them to continue their authoritarian tradition of land use planning. This planning is ostensibly about sustainable development, but in practise bears no concessions to the complex and varied

ecologies which it encompasses. Worse, it runs roughshod over the only resource available for an effective management of these areas – the knowledge of the people who live there and their commitment to work collectively. In turn the challenge for historians of environment in areas like Mazvihwa is how to open up space through their scholarship for rural people’s voices and knowledge to be heard, without abrogating that knowledge to themselves or losing sight of the fact that rights and local democracy, not new ‘appropriate’ externally-driven programmes, are the key to sustainable development.

Zimbabwe’s National Conservation Strategy (1985) ostensibly aimed to move away from authoritarian, rule-based development planning and toward a more flexible and participatory process. However, the retention of technical land use planning procedures based on standard models replicating those of the colonial era has undermined achievement of such goals. Land use plans remain insensitive to local ecological realities, to rural life and to people’s historical experience. To date the scope for local participation has been to endorse plans made by technical officials, now backed by party and local government structures.

These land use plans are particularly technically flawed when applied to the semi-arid former *deve* areas. Meaningful participation in such areas will entail completely re-thinking and re-structuring land use, inviting the community themselves to imagine new land use principles, and develop their own plans. People need to be allowed to recreate the top land woodlands and their unevenness, replacing unitary with scattered drainage, finding new alternatives to – or patterns of – contour ridging. To release pressure on the toplands that are currently farmed, the intensive cultivation of natural wetlands has to be allowed once more, and people require the return of at least some of the land alienated for commercial ranching in the region. Villages and their paths could now be sensibly sited and managed by people themselves, and new and old ways of integrating trees into agricultural and grazing lands found.

Whilst some community based programmes have achieved marked successes and built on local initiatives – notably in wildlife management under CAMPFIRE – the challenge to Zimbabwe government ministries to reform the legacy of centralised, technical development planning remains as great as it was at independence.³² Its implications for every day life in the communal areas are as profound as ever.

NOTES

¹ This paper is based on research undertaken in Mazvihwa of Zvishavane District between September 1985 and February 1988, with funding from the Medical Research Council (UK). I warmly thank the officials and members of the local community who participated in the study, and the local research team, in particular B.B. Mukamuri. This paper was

originally presented at the African Studies Association annual meeting in Cambridge in 1988. Several colleagues, notably Florence Shumba, helped to refine the arguments presented.

² In concordance with oral history, J.D. Cobbing, *The Ndebele under the Khumalos*, PhD Thesis, University of Lancaster, 1976, includes this area as one of Ndebele winter grazing.

³ For historical reference to the *deve* of this area of Zimbabwe see D.N. Beach, *Zimbabwe Before 1900*, Mambo Press, 1984, p21; *The Journals of Carl Mauch, 1869-1872*, Ed. E.E. Burke, National Archives of Rhodesia, 1969; R.M.G. Mtetwa, 'Red Soils in Mashonaland: a Reassessment: contrary evidence', *Rhodesian History* 6 (1975), pp 77-9; F.W.T. Posselt, 'A Survey of the Native Tribes of Southern Rhodesia', Government Printer, Salisbury, 1927, p26; J.D. White, *Esitshebeni: a History of Shabani District*, National Archives of Zimbabwe, 1974.

⁴ For further historical detail and a review of the debate over red soils and African farming preferences see Appendix Two, K.B. Wilson, 'Ecological Dynamics and Human Welfare: a case study of population, health and nutrition in southern Zimbabwe', PhD Thesis, University of London, 1990.

⁵ On land struggles in Zimbabwe see: R.H. Palmer, *Land and Racial Domination in Rhodesia*, London, 1977; and H.V. Moyana, *The Political Economy of Land in Zimbabwe*, Mambo Press, Zimbabwe, 1984.

⁶ Alienation of women from command over natural resources is a common structural problem in patrilineal societies. Subsequent research with women in Mazvihwa has overcome the male bias in the interviews presented here and shows that women were more involved in resource management than their formal position would suggest.

⁷ In neighbouring Lundi, for example, there were at one point reported to be 6,000 transport oxen. Assistant Native Commissioner, Belingwe, Annual Report 1925.

⁸ Dadaya Missionary Phillips reported in April 1926 that 'Some enterprising Europeans are employing all the boys procurable in cutting thatching grass for the mines at Shabani', and by May he was lamenting the absence of grass for the mission buildings since these settlers 'had received permission to cut all the grass they could find on the Reserve to fill a contract'. (Sir Garfield and Lady Grace Todd kindly allowed access to the Dadaya archives.)

⁹ Rotational grazing schemes are often promoted to rural people in Zimbabwe for their alleged enhancement of grass seeding. However, as argued by Mr Chibidi, failure of seed to germinate and grow in compacted soil seems a more probable explanation for poor grass cover than lack of seeding, though poor rainfall may accelerate this process. Stock may indeed therefore drive vegetation changes primarily through their impact upon the soil (Peter Frost, pers. comm., 1987).

¹⁰ For an analysis of the changing debate about rainfall decline in this community see A. Mawere and K.B. Wilson, 'Socio-Religious Movements, the State and Community Change: some reflections on the Ambuya Juliana Cult of Southern Zimbabwe', forthcoming in the *Journal of Religion in Africa*.

¹¹ For a discussion of factionalism, see Mukamuri, this volume.

¹² On the ecology of deforestation, see B. Higgs, 'Woodland Dynamics in Mazvihwa', BA thesis, University of Oxford, 1987; and; K.B. Wilson, 'Research on Trees in Mazvihwa and Surrounding Areas', ms., ENDA-Zimbabwe, 1987.

¹³ See K.B. Wilson 'Ecological Dynamics', chapter 3.

¹⁴ I.C. Scoones and K.B. Wilson, 'Households, Lineage Groups and Ecological Dynamics: issues for livestock research and development in Zimbabwe's Communal Areas', in

Socio-Economic Determinants of Livestock Production in Zimbabwe's Communal Areas, Eds B. Cousins, C. Jackson and I. Scoones, UZ and GTZ, 1988; and I.C. Scoones, *Livestock Populations and the Household Economy: a case study from Southern Zimbabwe*, PhD Thesis, University of London, 1990

¹⁵ It must be emphasised that the ecological issues of heavy grazing are different in sandveld environments which predominate in Zimbabwe's communal areas.

¹⁶ See K.B. Wilson, 'Trees in Fields in Southern Zimbabwe', *Journal of Southern African Studies* 15(2), 1989; and K.B. Wilson, *Ecological Dynamics*. Recent research supports this view in Mazvihwa that trees reduce erosion through improving soil structure through their leaf litter rather than because of a mat of roots actually binding the soil: H.A. Elwell, *Soil Conservation*, College Press of Zimbabwe, 1986; H.A. Elwell, 'Determinants of erodibility of a sub-tropical clay soil: a laboratory rainfall simulation experiment', *Journal of Soil Science* 37: 345-50, 1986.

¹⁷ This opposition has also been reported from other areas of southern Zimbabwe. However, A.K.H. Weinrich, *African Farmers in Rhodesia: Old and New Peasant Farming Communities in Karangaland*, Oxford, 1975, p.138, attributes resistance to de-bushing as 'refusal to work for the common good' and fails to understand the economic and ecological value of woodland in grazing areas.

¹⁸ On detailed arguments for having trees in grazing lands, see K.B. Wilson, 'Research on Trees'.

¹⁹ On chiefly lineage resource privilege, see Mukamuri, this volume.

²⁰ Dadaya Mission Monthly reports

²¹ J.H. Bannerman, 'Hlengweni: the history of the Hlengwe of the lower Save and Lundi Rivers, from the late eighteenth to the mid twentieth century', *Zimbabwean History*, 12: 1-45, 1981; and A.P. Jackson, 'Ample food without ploughing', *NADA*, 1954, pp 62-66.

²² Natural Resources Board Native Enquiry, 1942:44 (Zimbabwe National Archives, S988.

²³ J.F. Holleman, *Chief, Council and Commissioner: Some Problems of Government in Rhodesia*, The Netherlands, 1969, shows how complex were the ideologies underlying this kind of 'development' and that they certainly included the element of control.

²⁴ M.A. Stocking, *A Geographic Analysis of the Factors in the Erosion of the Soils of Rhodesia*, Mphil Thesis, University of London, 1972, p.149.

²⁵ M.A. Stocking, 'Aspects of the role of man in erosion in Rhodesia' *Zambezia* 2:8, 1972. A shocking account of technical incompetence accelerating soil erosion is provided in M.A. Stocking, 'Relationship of Agricultural History and Settlement to Severe Soil Erosion in Rhodesia', *Zambezia* 6: 129-45, 1978. For similar accounts from Lesotho see K.B. Showers and G.M. Malahleba, 'Oral Evidence in Historical Environmental Impact Assessment: Soil Conservation in Lesotho in the 1930s and 1940s', *Journal of Southern African Studies* 18(2): 289-93.

²⁶ Experienced soil conservation officers frequently stated that it would be cheaper, easier and more technically effective to employ permanent professional teams than to stretch supervisory capacity thinly over resisting forced labour gangs. The system of forced labour was favoured by the administration, however, because of the supposed educational benefits of local 'participation'.

²⁷ B. Floyd, *Changing Patterns of African Land Use in Southern Rhodesia*, Rhodes-Livingstone Institute, 1964, pp.326-9.

²⁸ For a review of the soil erosion implications of footpaths, stock tracks and roads see Elwell, *Soil Conservation*, pp.51-3.

²⁹ A contemporary report indicates that this was recognised at the time. The Assistant Native Commissioner of this district informed the Natural Resources Board Native Enquiry in October 1942 that 'In regard to roadwork, we are allocated so little money for roads in the Reserves that as soon as a road gets too bad it is cheaper to deviate and this simply results in the soil being washed away and the road turning into a colossal donga [gully].' National Archives of Zimbabwe S988, p.70.

³⁰ P. Zachrisson, *An African Area in Change: Belingwe 1894-1946*, Bull. Dept. History 17, University of Gothenburg, 1978; and Natural Resources Board, Native Enquiry, 1942:69 (NAZ S988).

³¹ F. Du Toit *Musha: The Shona Concept of Home*, Zimbabwe Publishing House, 1981, p.5, refers to homes 'traditionally' being 'linked by winding footpaths (never in straight alignment).'

³² See also M.J. Drinkwater, *The State and Agrarian Change in Zimbabwe*, Macmillan, 1993. For review of the successes and limitations of the transformation of Zimbabwe since independence see I. Mandaza (Ed.), *Zimbabwe: the political economy of transition, 1980-1986*, Codesria, Senegal, 1986. Especially relevant are sections by S. Moyo, C. Mumbengegwi and T.D. Shopo