20 WATER FOR LIVELIHOODS: BRINGING EQUITY AND OPPORTUNITY TO THE RURAL POOR IN SOUTH AFRICA

Dirk Versfeld

Department of Water Affairs and Forestry, South Africa (dirki@iafrica.com)

Summary

South Africa is a water scarce country with a history reflected in deep inequities in the distribution of both land and water. The available water resource has for the most part been allocated to existing users - primarily agriculture, mining, industrial and urban. The country has a good record in providing basic minimum supplies of water to the rural poor and this effort is continuing. Only now is more thought being given to making larger volumes of water available for sustainable livelihoods, making this symposium on water for productive use particularly timely. The available runoff is now almost all utilised or captured and redistributed through dams and canals. There is little opportunity for further exploitation of the resource, and new users are now in competition for the existing available water. Irrigated agriculture is the key user, taking up 56% of the available resource with a contribution of only 4.7% to GDP. This makes it an obvious target for resource redistribution, yet the benefits are shown to be far wider than this primary contribution. It is ironic that the one way of easily redistributing water into the historically disadvantaged sector is through irrigated agriculture, yet this will only worsen the shortages experienced and will do little to resolve the fundamental issue – which is to make water really useful to a significantly large proportion of the rural poor.

Using the catchments Usutu-Mhlathuze Water Management Area as a case study, the depth of inequities to the majority of rural inhabitants, notably on communal land, is made plain - with communities occupying 36% of the land, comprising the majority of the population, and receiving only 8.6% of the water. It is argued however that bald percentages are a very poor way of estimating the extent of inequity, and attempts to correct the situation on this basis may only make things worse. It is essential that water resource managers (i) recognise and understand the inequities experienced by the rural poor (ii) consider the costs and benefits of allocations to different land use sectors (iii) understand the value and importance of people on the land (iv) understand the roles which water can play in offering sustainable livelihoods.

South Africa is supported by new and powerful legislation in its management of water resources. These Acts include the Water Services Act, which provides for water for living, and the National Water Act which recognises the equity imperative, and puts mechanisms in place whereby water can also be made available for livelihoods. The most powerful of these tools is called ‘compulsory licensing’ which allows the regulator to move water out of the hands of the 'haves' and into the hands of the 'have nots'. This must however be used with great caution and understanding – in order to ensure that real benefit ensues, and that this opportunity too is not wasted. Water users are now required to register and license their use – but small users are freed from this responsibility through schedule 1 of the NWA. There is continuing debate on how much water should be granted as a basic livelihood minimum without licensing, a debate which stands to be informed by this symposium on Water for Productive Use. It is essential that the alternative road to use be made clearly available to the resource planners if a distributed allocation is to be cogently argued for and achieved.

20.1 Introduction

South Africa is a dry country – with an average rainfall of 450 mm per annum and total flow from all rivers less than 50,000 million m^3 per annum, which is just half that of the Zambesi alone (DWaterAF, 2003). The total surface area is 1,123,226 km^2, and the population estimated at 48 million, of whom 70% are rural. Most of the country’s readily available water (estimated at 12,000 million m^3) is already harvested, with an impressive network of dams and inter-basin transfer schemes providing both for urban and industrial needs and for large-scale irrigation schemes. To add significantly to the available resource is no longer easy, as evidenced by the major investment in the Lesotho Highlands Scheme - the shifting of water from the upper reaches of the Orange/Senqu River catchment in neighbouring Lesotho, to South Africa’s industrial heartland of Gauteng. The country has also put immense effort into putting basic water supply and sanitation systems in place to serve the rural poor.

This is a country accustomed to upheaval, with African continental colonization from the north clashing with European colonization from the south, throughout the 19th century. The land was occupied and farmed with great intensity by the time of Union in 1910. The Great Depression of the 1930s was a catalyst for another major demographic shift, with the rural Afrikaner moving off the land and into the urban environment. This shift was known as the 'de-population of the platteland (or heartland)', probably aptly so as much of the black population had already been squeezed onto 13% of the land area through the 1913 Lands Act. This movement off the land ultimately led to a consolidation of power in the Apartheid regime which ruled the country for half a century. Today we have another seismic catalyst in HIV/AIDS. Population projections of 70 million people by 2025 have now been 'downsized' to perhaps 52 million, a scant increase on today (DWAForestry, 2001a). Even more tellingly, rural populations are hardly expected to grow at all in the next 25 years, held down by an average expected lifespan of only 42 years, and a drift to the cities. This drift is exacerbated by the need for better medical services, the expectations offered by a consumerist lifestyle, and the extreme difficulty of living off the land.

South Africa has invested heavily in agriculture, and particularly in irrigated agriculture, over the past 50 years. This can be seen as the ruling elite of the past seeking to re-establish and maintain a rural power base. It was also the response of a national power which held the land and farming very close to its heart. At the present time some 56% of the country's water is devoted to irrigation. In statistics which are easy to misrepresent, agriculture only accounts for 4.7% of the nation's Gross Domestic Product. However agriculture-dependent manufacturing and industries add another 10.46%, and the addition of agriculture-related use of services to the GDP brings the total to 22.26% (including forward and backward linkages). Irrigated agriculture is an undefined but important proportion of that. Agriculture employs some 50,000, predominantly white, commercial farmers employing about 1 million workers and providing for about 6 million people. It is further estimated that there are an additional 240,000 small farmers supporting a million people, and 3 million 'household farmers' mainly on communal land (Department of Agriculture, 2001). The Department of Agriculture concludes that "more than half of the provinces and 40% of the country's total population are dependent on agriculture and related industries.

There are deep inequities in the distribution of land. This has been long recognised and land reform has been an important South African issue since 1994, even if too little has yet been achieved. South Africans are only now beginning to recognise the polarisation in the allocation and use of water resources. Ours is a country of 'haves' and 'have nots' where most of the land and water resources are already locked into existing owners, users, and a chain of dependencies. Water is pivotal to the livelihoods of rural people in a dry country, and an understanding of the inequities in water distribution, and the need to find meaningful ways of making sure that water is made available to the millions still on the land, is the focus of this paper.

20.2 Water availability and its allocation in South Africa

As noted above the country is not rich in water, and most of what there is has already been captured, stored and allocated to (i.e. divided out amongst) users – this at least at the macro-scale. The country has now been divided into 19 Water Management Areas (WMAs - either large single basins or conglomerates of catchments). A water balance is presented for each of these Water Management Areas in the National Water Resources Strategy (DWAF 2003). In practically every Water Management Area the water balance shows the existing allocation to either match or exceed the water deemed available. Under these circumstances the basin or catchment is considered to be stressed and it is generally closed to any new development requiring additional water. In other words, at least in theory, there is no further water available to allocate to new users, unless there is further development of resources. And the stresses are piling up as primary demands such as the Basic Human Needs Reserve and the Ecological Reserve are added into the equation (see also Pollard *et al.*2002,). This is of particular relevance to equity. If water is to be reallocated to the poor for the alleviation of poverty, then there must be water available to allocate, and, if we look at the figures provided by the Department of Agriculture, taking water out of the main user sector (irrigated agriculture) will mean impacting on that sector's ability to provide a significant percentage of the country's people with jobs. This is true even if that water were to go into other irrigation schemes based on equity considerations.

What we have reached is a situation of water scarcity with a number of deserving but conflicting demands on use. Agriculture is important but South Africa is heavily dependent on its mining/ industrial/ and manufacturing base. This the country wishes to, and needs to grow. What is essential

is that the position of the 70% of rural people living on the land, and the contribution they make, is recognised and that meaningful volumes of water are also made available. The conflicts arising from new demands are going to require changes in the allocations of water as we know them. It is a safe assumption that these changes will bring pain to some, and the challenge is going to be to manage that conflict and minimize that pain.

An understanding of the issue of water, poverty and productive uses at household level is critical to management decisions with regard to South Africa's water resources.

Table 1: A national overview of water resource availability (source, draft National Water Resource Strategy, DWAF, 2003). Total MAR 49,228 million m^3.

a) Available yield in year 2000 (million m^3/a) (after allowance for the impacts on yield of the Ecological Reserve, river losses, alien vegetation, dryland agriculture and urban runoff)

Natural Resource		Useable return flow			
Surface water	Groundwater	Irrigation return flow	Urban return flow	Mining and bulk industrial return flow	Total yield
10 928	1 042	672	1015	254	13,911

b) Water requirements for the year 2000 (million m^3)

Irrigation	Urban	Rural	Mining and bulk industrial	Power generation	Afforestation	Total
7836	3332	572	756	296	488	13,280

c) Reconciliation of requirements and availability for the year 2000 (million m^3)

Yield	Transfers in	Requirements	Transfers out	Balance
13 911	0 (i.e. in balance)	13280	127	+ 504

d) Scenarios showing estimated reconciliation or requirements and availability

Base scenario for the year 2025 (million m^3/annum)

Yield	Transfers in	Requirements	Transfers out	Balance	Potential for development
14 681	0	14 486	127	+ 68	5 576

High scenario for the year 2025 (million m^3/a)

Yield	Transfers in	Requirements	Transfers out	Balance	Potential for development
15 460	0	17 248	127	- 1915	5 576

20.3 Usutu-Mhlathuze case study

Let us look first at an example of what seems clearly to be an inequitable distribution of resources. The Usutu-Mhlathuze Water Management Area (covering northern KwaZulu-Natal and a small portion of southern Mpumalanga province) is a conglomerate of six independent catchment areas. A significant proportion of this part of the country is also held as communal land, with a high population density of rural dwellers. The currently estimated requirements for of water by different sectors of society are shown in Table 2.

Table 2. Currently estimated water use requirements (million m^3) by different sectors in the Usutu-Mhlathuze WMA.

Water use sector	Amatikulu	Mhlathuze	Mfolozi	Mkuze	Pongola	Upper Usuthu	Total
International					153		
Irrigation	10.3	100	60	64	215	16	465.3
Forestry/ Sugar	9.4		6	4	40	36	95.4
Invasive plants		7					
Urban	3.4	21	10	1	2	8	45.4
Industrial	2.0	85	4	0	5	0	96.0
Rural	4.0	8	14	10	6	5	47.0
Ecological	8.0	16	25	45	160	79	333.0
Transfers			18			198	
Total	37.1	237	137	124	581	342	1458.1

Note: do not necessarily match current allocations. (Source: DWAF unpublished data 2003)

In a Strategic Environmental Assessment, focused on water in the Mhlathuze Catchment, an overview of communal land distribution, the numbers of people living on this land, and the formal allocations of water led to the startling conclusion that 85% of the people lived on 50% of the land and received 1% of the water (DWAF 2001). This stark presentation of the figures was an over-dramatisation of the true situation and has rightly been contested. In the first instance an additional 10 million m^3 has long been allocated to black farmers, but not yet taken up. This amounts immediately to another 3% of the total system allocation. To see allocations to industry, domestic and other users only as an allocation into the 'white' sector is also a gross simplification. Yet the message the over-dramatisation projected remains valid and of great importance. The inequities in water allocation are wide – and there is an urgent real need to redress these.

To simply view allocations as being either into the 'white' or 'black' sector, or 'community' is hardly a good way of reflecting the distribution of benefit to these sectors of society. So, for example, an extra 10 million m^3 provides only for 100 farmers to irrigate 10 ha of land each. This means that in the Mhlathuze only 100 more 'disadvantaged' (black) people (out of a population of 600,000) have more water although the 'allocation' jumps from 1% to 4%. We need rather to look at what we really want to achieve, and where the benefits go in terms of the majority of the people we purport to reach in adjusting the volumes of water allocated across the 'black' and 'white' sectors.

Table 3. Allocations of water to rural communities in the Usutu-Mhlathuze catchment

Catchment	Area (km^2)	Non-communal land area (km^2)	Communal land area (km^2)	% water allocated to rural communities
W1 Mhlathuze	5 728	2 819	2 909	5
W2 Mfolozi	10 136	5 307	4 829	15
W3 Mkuze	9 693	6 498	3 195	7
W4 Pongola	11 868	8 956	2 912	2.3
W5 Usuthu	8 161	7 155	1 006	4.7
W7 Sibayi	2 625	225	2 400	No surface water
Total	48 211	30 960 (64.2%)	17 251 (35.8%)	8.6% (weighted)

The inequitable allocations of water bring very understandable calls for 'water reform'. The sectoral disparities seen in Table 2 can also be seen in terms of allocation on a land area basis, as per Table 3 for the Usutu-Mhlathuze catchments.

Having recognised the inequities, and knowing that it is the black people in this country who have been historically disadvantaged, and knowing that water can really make a difference to people's lives, and acknowledging that allocating water across sectors simply in terms of 'black' and 'white' is not the way to achieve equity – a practical task list can be drawn up.

- Assess the needs of the poor and how these can best be redressed
- Assess the rights which people might have had (and the allocations they would have received) had all been treated equally through history
- Assess the opportunities which the land and the environment offer in terms of new water use
- Consider the constraints which hinder the realisation of these opportunities

- Consider the practicalities of bringing water to these areas and people, and the benefits which this would bring. (Perhaps also consider the establishment of 'water nodes' which serve to bring people to the water).
- Place this alongside the costs to society (including costs to the 'previously disadvantaged') in the event of reallocating this water out of other sectors (should this be necessary), and also the alternative ways in which this same water could be allocated, or reallocated, and used.

To this we must add the development of an understanding of Water for Productive Use at sustainable livelihoods level, and how this can impact on the quest for equity. The challenge then is to establish a programme to achieve the necessary adjustments.

20.4 Legislative change and equity in South Africa

20.4.1 The National Water Act as a tool for managing and redistributing water

There have been really big changes in water legislation and management over the past decade. The Water Services Act (WSA, Act 108 of 1997) recognises that everyone has a right of access to basic water supply and basic sanitation. A new National Water Act was written into South African Law in 1998 (NWA, Act 36 of 1998). This provides for a radical departure from the way water has been viewed, owned and managed in the past. The underlying fundamentals of the Act are the management and utilisation of water in an equitable, efficient and sustainable manner. The old concept of 'private water' has been done away with. This means that water does not automatically belong to you if it falls on your land. And if a stream arises on your land, or if you live or farm alongside a stream or river, you no longer automatically have a 'riparian right' to use the water in that river. A key provision in the NWA, known as *'compulsory licensing'*, allows for water currently allocated to users to be re-allocated to previously disadvantaged people – a provision aimed directly at allowing equity redress in a seriously skewed society. The State has taken greater control over water resources.

This poses deep questions with regard to the informal and small-scale user. All users must now register their water use and will have to apply for a water use licence. That is all well and good if you are already a user. It is not difficult to see the need to formalize that use. The existing irrigation farmers who own the land and have developed the resources, or who reside within Government Water Schemes and have been given the water, already have their hands on the bulk of the resource. But what if you have nothing, if no resource has ever been developed to which you can now lay claim and can licence? What if you are not even aware that you or your community has been denied a tremendous opportunity through water, which has all been channelled off elsewhere. What do you apply for? And, once all available water has been licensed, it will be even more tightly tied to its new owner, at least for the duration of that licence. So how does the indigent landholder know what to do? This is a reality – and a situation which Government is going to have to take great care in addressing.

As suggested above, one way is to make assessments of what the potentials are, what opportunities have been denied, and what requests or demands for water might later be received, no matter how belated in terms of deadlines, and to make some provision for this. Another is to seek and allow for other innovative, and probably more realistic, practical and beneficial ways of making water more broadly available to a far wider spectrum of society. This brings us back to water for productive use at household level.

On the other hand Government (the current water resource regulator) is now in a position to take from those who have too much to give to those who have too little. Water allocated to users in the past has been considered inviolable. Now there are tools and mechanisms, both market-related and regulatory, to bring about some movement. The primary tool is known as 'compulsory licensing', a process through which the state is empowered to reduce existing allocations in order to balance water availability with use, in order to 'find' the water necessary to bring about a balance where allocations exceed existing supplies, meet the needs of the Reserve (both basic human needs and ecological), and in order to make water available for equity allocations.

20.4.2 Registration and use by previously disadvantaged users

Whilst all significant users of water must clearly register and license that use, it is neither possible nor desirable to register each and every water user in the country. There is a legislative mechanism, schedule 1 of the NWA, which allows for small-scale users to go about the business of living and

survival. Given that there are some 2 million boreholes being used in this way, the administrative reasons for Schedule 1 are obvious. But this provision has its own grey areas and has been the subject of intense debate during this past year.

A small farmer irrigating 1 ha might require 10,000 m^3. Would such a farmer need to licence? And what if only farming on 0.1 ha, or even on 100 m^2? With sound water management the objective of the legislation, what about cumulative use? Schedule 1 allows for *normal domestic use* without an authorisation or licence. The question lies in the definition of 'normal domestic use', and again a knowledge of water for productive use at household level will help in understanding and defining this, and will perhaps help us in getting away from only catering for the bare survival minimum of 25 l/ person/day. A generous guideline of 5 m^3 /day based on urban households (with swimming pools and lawns) is being applied by the Department (J. Wessels pers. comm. 2002). There should be little difficulty in planning for an increase from 25 l to maybe 100 l/day, offering something for productive use. But there is a big gap between provision on paper and actual supply and delivery. It is unlikely that many communities or villages will be able to harvest these volumes themselves, and only when demand for a reasonable supply for productive use/sustainable livelihoods of say 100-150 l/person/day becomes the norm will the supplier be required to deliver, and there will then be a real pressure on these volumes. The catch 22 lies in supply. It is one thing to make that kind of water available on paper but, as long as it is up to the users to get or collect that volume of water, the system will never have to deliver. The Water Management Authority can be sure that it will never be required to meet this kind of supply – because there is no chance that users will, in any numbers, be able to take advantage of the allocation.

Given the expressions of intent made by DWAF's Directorate Water Resources Planning with regard to the Limpopo Water Management Area, perhaps this is an unfairly cynical view. In the Limpopo Water Management Area, situated in the most northern part of the country, there is absolutely no further surface water available for allocation. We also find some 1.2 million rural people living in the catchment with little more than their basic water supply. But Limpopo has extensive and well-distributed groundwater resources, estimated to recharge at a rate of approximately 2% of Mean Annual Rainfall. There is already extensive commercial use of this groundwater resource, but it also provides the opportunity for a distributed model of water resources for sustainable livelihoods. In other words an allocation of, for example, 100 l per day can be made to all rural dwellers – and theoretically this could in large measure be taken up. Although pump, distribution and maintenance issues all need to be considered, what is important here is that, from a water resources perspective, the regulatory authority (DWAF) sees this as one extensive area where it can put its money where its mouth is - and make provision for the very extensive use of significant volumes of water for domestic and local productive use, on a significant scale, and in ways where the opportunity might be meaningfully utilised.

20.4.3 How do we best achieve equity allocations?

Much of this discussion focuses on inequities in water allocations and the need to redress these. One way is through land reform where the land carries with it a water allocation. Transfer the land and you transfer the water. Another is to provide new allocations for irrigation to black farmers. This second option only exacerbates the situation where a sector already uses 56% of the water. Neither option really does anything more than resolve the equity issue (to some degree) on paper. More black farmers will have water use privileges, as white farmers do today. This does very little or nothing for the millions of other black rural dwellers trying to live off the land in one way or another.

This means thinking about how water can be offered to, and effectively used by, many millions of rural landholders, and not just a few big irrigation players. At stake here seems to be the ability of the regulatory authority to make a sufficient volume of water available to landholders and to poor people living in rural areas (maybe not even very rural) so that this can make a real difference to their lives. At the very least, the regulatory authority should not be making the use of water a forbidding or impossible problem.

20.4.4 How can water be used productively?

Pérez de Mendiguren (2003), and many others at this symposium, have shown that there are many ways in which people can turn water to beneficial use. The key option seems always to be gardening/vegetable growing at the small plot scale, although water for micro-business enterprises also comes to the fore. Small plot gardening can also be most productive from a food security point of view, especially where applied at the household scale. Other ways in which people can capture and use water include rainwater harvesting through the channelling of roofwater, urban and peri-urban

runoff, the construction of swales and runoff traps, etc. None of this should require any form of regulation or licensing – and it is doubtful whether even very extensive water conservation measures of this nature would significantly impact on the water balance of a catchment - significantly to the point of affecting other users.

In a brief unpublished desktop survey on behalf of the Department of Water Affairs and Forestry, Versfeld (2001) sought from the South African development world what work was being done and all ways in which people felt water could be applied for productive uses. The outcome of this research was very telling.

The survey documentation (dated 21 March 2001) suggested that Water for Development seems to be a national 'blind spot', and that as a nation we need to:

- Raise this as an issue of national concern.
- Evaluate the situation and the need against water allocation policies, plans, programmes and trends.
- Investigate ways in which water is used and could be used so that it can make a real difference to rural living without placing impossible demands on the national resource.
- Assist the regulators (DWAF) and the users (people using water and all those in the development arena) in unpacking this issue and seeking practical solutions.

Approaches suggested included:

- To identify opportunities together with people so that they have a clear use for water and can therefore apply for an allocation to meet this use.
- To set water aside so that it is available when needed (that means, in effect, to maintain a 'development reserve').
- To licence water users but in a highly conditional way – so that this water can be accessed for equity when the demand becomes patent. (This is always tricky – users develop a dependency, and lots of jobs may well hang on the availability of water. It will take hardheaded Agencies to rescind, or fail to renew, licences).
- A provocative school of thinking argues that all focus should be on urban and industrial development – essentially a 'city life for all' This discounts the value of the land, the desires of the people who live on it, and the social realities of urban crowding. (See also Section 5, this paper).

Possible activities which could be supported by the provision of more water (or water use licences) were offered as being:

- Subsistence agriculture, plot gardening etc.(supported by local water harvesting, extraction from local sources such as boreholes and streams, or through piped supply)
- Irrigation schemes - the paradigm we have always been in, but one which may have its place under some circumstances and in some catchments
- Small-scale irrigation schemes
- Aquaculture
- 'Livelihood scale activities' – (e.g. chicken farming, ice blocks, brick making etc)
- SMME development (e.g. silk farming, timber products)
- Manufacturing and crafts – (e.g. pottery)
- Tourism
- Forestry (various forms are possible)
    - Industrial forestry – fast growing species
    - Indigenous forest units (slow growing trees recognised to use less water)
    - Managing, harvesting and processing of alien invasives

It is significant that this survey generated a great deal of excitement and committed interest - and many respondents voiced concerns, such as the need for water in land reform. There were also concerns about efforts to create a new agricultural middle class, and with this a growing dependency on irrigation water (although the importance of agriculture in the national economy was emphasised), and concerns that yet more irrigation schemes might be created in the quest for equity. NO additional ideas were added to the above list. If there is anything to add then this symposium should do so!

An interesting mechanism in the allocation of water, perhaps peculiar to South Africa, is the allocation of afforestation licences. This need to licence forestry stems from the fact that trees use a measurable volume of water, 1,000 m^3 per ha per year being an easy rule of thumb, and forestry has been

legislated as a 'Stream Flow Reduction Activity'. Allowing for forestry becomes a way of providing water to users – with a licence for 1 ha being the equivalent to supplying 1,000m^3, without any supply infrastructure at all! This option has been taken up, unwittingly, by many rural dwellers in KwaZulu-Natal, indeed South Africa has some 19,000 such small growers (mostly 1-2 ha) accounting for some 40,000 ha of forestry. Again DWAF has made it clear that it will countenance equity allocations for more forestry in catchments which have long been held as closed for white growers.

Other forms of dryland cropping, such as sugar cane production, do also use water, with dryland sugar reckoned to use about half that of forestry. At present sugar does not require a licence and therefore it does not need to be registered, nor does it receive an allocation - but the area of land under dryland sugar is already brought into catchment water balance calculations, so it is certainly accounted for as a water use.

20.5 Costs and benefits – making decisions

Should water be going to irrigation farms, subsistence users, mines, or industry? Gauteng is perceived as being the wallet of the country but the land and its people are its heart and soul. And who really wants to be without heart or soul? In the 'people vs industry' debate I would certainly argue for balance – and I can say that DWAF is taking a pretty measured approach in this regard too.

It is therefore time to pick up the cudgel in the "Jobs per drop" debate. I prefer to see this as "Bang per Bucket". Agriculture makes a very strong case for the benefits it brings, yet one cannot help but wonder if the situation would not be very different had it developed differently. Would we be seeking to invest more water in agriculture if our current investment in the sector was lower and if industry and mining were the bulk users? This requires an unpacking of the financial vs. economic benefits of different users (how sustainable is mining? or irrigation for that matter?), the real value that people derive from natural resource use, and, as always, the alternative road of providing water for productive use.

20.5.1 Water for irrigation

It is unfortunate that irrigation schemes which have attempted to move water across the equity divide in the past – and the apartheid government was not short on such schemes - have rarely been of much success. Indeed there are many resounding failures too easy to point fingers at. The reasons are often obvious, and linked to social, institutional, infrastructural and especially ownership causes. There are exceptions, but little to suggest that this is the route to take. There remain a number of 'water for irrigation' allocations which have never been taken up – and the current approach, in addition to attempts to revitalise some previously failed schemes, is to focus first on getting communities to take up this allocated but unused water (an example being the Mhlathuze catchment). In the case of a community allocation from the Arabie Dam (Olifants River system), in a deal brokered by DWAF, a temporary trade for 5 million m^3 was arranged whereby the community has effectively leased its use rights to a local mine seeking water for development, in exchange for other benefits. In this case the benefits were seen to be greater, or at least more accessible, than those that would be gained from taking up the allocation and farming with it – but again we need the wisdom of this sort of forum to help understand if this is true.

The current approach reflects a clear reluctance to allocate any new water into irrigation schemes. Perhaps caution should be expressed with regard even to the taking up of existing allocations – or rather whether these should be used as originally intended - i.e. by a relatively small number of farmers embarking on commercial agriculture. Much clearly should depend on whether this water could be better used by the wider community (for productive use/sustainable livelihoods) to which the farmers belong. That could mean wide scale supplementation of subsistence use (giving each home a substantial water allowance), or other form of productive use.

20.5.2 Some decision-making examples

It is useful here to do an exercise on the back of a matchbox. In the northeastern reaches of Mpumalanga Province (the very area which is the focus of de Mendiguren's work) we have the peri-urban apartheid dumping ground of Bushbuckridge and surrounding villages. A sort of megalopolis. If, hypothetically, we were to take 3,000 ha of irrigated cropping (this would typically be mangoes and oranges) out of production we would, theoretically, be able to give each of the 750,000 people living in Bushbuckridge an additional 100 l of water per day. Many local jobs would be lost with the loss of so much commercial agriculture, and the local economy would suffer deeply. There would be immediate

and very severe pain. But would the community ultimately be better off? Or would it have been better off if this approach, in sharing out the water, had been taken from the very beginning? Obviously this assumes resolution of distribution problems and all the other manifest objections, but it bears thinking about.

Another example: In the Limpopo Province there are hundreds of rural villages scattered across the landscape. These are miles from anywhere, 4-6 hours commute time from Gauteng, and show no sign of self-sustenance. Yet there are substantial groundwater resources and we have seen (above) that DWAF sees positively the model that this ground water should be allocated to the people living there. The questions first are "how much?" and, "what would the impact be"?

20.5.2.1 Assumptions

- (i) Each homestead comprises 6 people. BHN = 25l/day = 10m^3/year/person or 60 m^3 /yr / homestead.
- (ii) Each homestead occupies 200 m^2 (50 homes/ha). 10 ha therefore accommodates 500 homes or 3,000 people and a BHN requirement for this settlement would be 30,000 m^3. This would be a moderately sized village. The Limpopo Water Management Area has 760 villages and 1,700,000 people, an average of 2,240 people/village, so 3,000 is quite typical.

20.5.2.2 The sums

- Irrigation on 10 ha (area of a 'typical' village) would require 100,000 m^3 of water (at a typical irrigation allocation of 10,000 m^3/ha). So we have the BHN of people living at a relatively high density coming out at 30% of an irrigation allocation. Clearly BHN offers pretty dry and dusty living and we would want to offer more. People should be demanding more. Surely we can afford what irrigation would demand? One way to look at this would be to estimate, if each household lived on an area of 100 m^2 and the additional 100 m^2 was made available for food production, how much water this would take, and what the costs and benefits might be? Assuming an irrigation level allocation it would take an additional 50,000 m^3 to provide the water needed to farm the plots in one village (5 ha of land) – and, assuming that a significant amount of food can be produced on 100 m^2, this would provide food security to 3,000 people.
- Extrapolating this up to the Limpopo WMA we would need to "water" 760 villages of 2,240 people at a total cost of 17 million m^3 to meet BHN. In fact at these living densities (6 people /100 m^2) the BHN is equivalent to 60% of the irrigation allocation of a 100 m^2 plot. Allowing for a doubling of the BHN requirement for human use alone increases the water requirement to 34 million m^3. Allowing an irrigation equivalent allocation to the remaining 100 m^2 of plot area would mean another 34 million m^3 of water. To sum that up, all individuals living in these rural villages could receive twice the BHN minimum and all plots sufficient water for productive use (being sufficient for substantial irrigation production or other purpose at a total water cost of 68 million m^3. This is < 10% of MAR and about 25% of total available yield from the area – perhaps the right way to distribute and use available water.

The key debates in the Limpopo may not revolve around the "if" but the "how". Here the national Department of Water Affairs and Forestry sees an opportunity through the distributed nature of the resource. There would need to be a compulsory licensing process which would seek to secure this sort of volume of water from the regional balance – and a strategy then to see the water redistributed. This is a tall order – but there must first be a vision, and this sets new standards in vision.

20.5.3 Water trading

This concept tests the key premises of benefit – and puts many of the equity issues on the line.

As allocator and licensor of water resources the Department of Water Affairs and Forestry has long had a very wary eye on the concept of trading. In practice the Department has permitted certain significant trades of water *within* sectors. A farmer has always had the choice of how he uses his allocation (he/she can grow pineapples without question even if the allocation was based on sugarcane). Farmers have also been relatively free to trade their water within a scheme and perhaps even within the sector. DWAF has not had a serious problem with some internal shuffling, but has not wanted to see water resources, created for the purpose of agriculture within a particular area, being traded out of that use and that area, the key reasons being concern for job losses, but also control over the long-term deployment of the resource. There have however been some trades out of agriculture to meet domestic and urban supply needs, a celebrated case at Graaff Reinet in the Eastern Cape being one such example. More recently, and described above, a community at Arabie Dam in the Olifants Catchment in Mpumalanga was allowed (perhaps even encouraged?) to trade its

water on a temporary basis with a platinum mining company. Trades are now being viewed more freely – and it is argued that once licences have all been issued and compulsory licensing effected, users will have allocated rights to water which they may more freely trade. Indeed this is seen as one of the potentially most effective mechanisms to start the movement of water out of irrigated agriculture to more highly paying uses. But, "Is that more highly paying use a "better" use for the people of South Africa, and will these trades not subvert the equity goals of the Department?" Certainly trades are likely to be vetted in many areas in terms of cost and benefit, not only to the licensee, but also to the many other people affected by such trades.

20.6 Conclusions

It is obvious that there are inequities in the way water is distributed, and in the user profile. It is also clear that this should not be dealt with as a 'numbers game'. Water is a national asset and must be put to the best use of the country and its people. The existing users all play an important role in the economy and any shifts in the way water is allocated and used will bring pain to some. In the event of change, the benefits, even if to others, must outweigh this pain.

Most critical is that water resource planners know and understand the value of water to rural people, and know what can and will be productively used and how. Only then can the planners be expected to make sufficient allowance for such use. Agriculture has a large share of the resource and makes a significant contribution to the national economy, yet to allocate more water now to 'black' agriculture can only be counter-productive. Allocating water for productive uses is a distinctly different thing however. The idea of getting a meaningful volume of water to rural people so that they might achieve some form of livelihood, either through gardening, small-scale farming, forestry or other type of productive use, has taken root within the offices of the national water regulator. A proper understanding of productive uses will help ensure that a realistic level of water is set aside, and ultimately made available to rural dwellers, rather than allocated only to large and recognised users. This will lessen the inequities experienced in a meaningful way by bringing meaningful volumes of water to a large number of people. It is one thing however to plan and to allocate – and nobody should underestimate the distribution and resource use issues associated with water.

20.7 References

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