

We are IntechOpen, the world's leading publisher of Open Access books Built by scientists, for scientists

4,900

Open access books available

124,000

International authors and editors

140M

Downloads

Our authors are among the

154

Countries delivered to

TOP 1%

most cited scientists

12.2%

Contributors from top 500 universities



WEB OF SCIENCE™

Selection of our books indexed in the Book Citation Index
in Web of Science™ Core Collection (BKCI)

Interested in publishing with us?
Contact book.department@intechopen.com

Numbers displayed above are based on latest data collected.
For more information visit www.intechopen.com



Integration Challenges of Water and Land Reform – A Critical Review of South Africa

Nikki Funke and Inga Jacobs

*Council for Scientific and Industrial Research (CSIR)
South Africa*

1. Introduction

The equitable utilisation of water in the real world is a very complex challenge involving a wide range of often competing actors and factors that need to work synergistically and be integrated if we are to effectively manage this valuable resource for productive land use. Additionally, the relationship between land and water is politically, economically and culturally complex and this complexity is expected to increase with the progression of growing populations, increasing water scarcity, growing demand for water, and food security concerns. This challenge is bound to gain global significance particularly in regions where communities are vulnerable to the profound impacts of global change. Integrated policy, planning and management of water and land resources can therefore provide improved benefits and create innovative opportunities for regional economic development by contributing to ecosystem stability, sustainable livelihoods and food security.

Water and land reform in South Africa is a special case highlighting the importance of integrated approaches. The last two decades have seen an abundance of comprehensive reforms the world over in the management of natural resources, with an emphasis on greater integration, the devolution of power and the decentralisation of government decision making. In the developing world, this phenomenon has been particularly prevalent in the water and agricultural sectors with new national development policies and action plans developed and harmonised to regional and/or international legal and institutional frameworks. Technocratic templates from developed countries in Europe and North America, such as the concept of Integrated Water Resources Management (IWRM), have also been suggested as best practice. However, not enough attention has been placed on factoring in local configurations, domestic policy, political identities, and social and cultural institutions, particularly in the African context (Jacobs, 2010).

In South Africa, water and land reform policies have been embedded within a complex socio-political and socio-economic environment, and yet have occurred largely independently of one another. South Africa presents an interesting example of the consequences of the non-integration of reform policy and yields lessons for countries in the rest of the world in terms of the challenges to successfully implementing land and water management reform programmes. The role of the South African government in providing a coordinating role is important. However, a concerted multi-stakeholder and multi-sectoral

effort is required at all levels, from the local to the national, if integration is to be operational and implementable.

2. Motivation

Despite the fact that the interconnectedness of water and land and the relevance of these resources for sustainable development have been well-documented, both resources are still largely managed as isolated policy issues and only limited research focuses on the numerous links between them. There is still a weak link between land reform, agricultural support and water resource provision (Greenberg, 2010). In South Africa, many land reform farms have failed because of water not being available for production. The synchronisation between water allocation and land reform programmes in irrigation areas therefore has to be improved to ensure that beneficiaries hold secure land and water use rights once they have been allocated their land (Groenewald, 2004).

Integration is however easier said than done, and can only be achieved through the acknowledgement of a diverse multi-actor landscape and consequent diverging interests and perceptions. This can only be achieved if the current tendency by government departments and sectors to work in “silos”, without much integration, is transformed from the programme level. Once this is achieved, we will be able to come to terms with the existence of multiple social and cultural norms that shape how water and land are managed.

3. Definition of terminology

Several integration approaches have been developed over time to better conceptualise the meaning of “integration” and how it applies to natural resource management processes, policy implementation, and theoretical frameworks.

3.1 The “Integrated” in IRM, INRM and IWRM

Firstly, the term Integrated Resource Management (IRM) is somewhat ambiguous and not always clearly defined, and, as such, is often operationalised in a variety of ways. Integrated Natural Resources Management (INRM) has been described as a conscious process of incorporating multiple aspects of natural resource use into a system of sustainable management to meet explicit production goals of farmers and other uses (e.g., profitability, risk reduction) as well as goals of the wider community (sustainability) (Sayer and Campbell, 2004). INRM is also described as an approach that integrates research about different types of natural resources into stakeholder-driven processes of adaptive management and innovation. The aim of this process is to improve livelihoods, agro-ecosystem resilience, agricultural productivity and environmental services at community, eco-regional and global scales of intervention and impact (Thomas, 2002). The focus is agriculture specific, which speaks to the chapter’s focus on integrated water allocation and land reform.

A related term that is also of relevance to this chapter is that of Integrated Water Resources Management (IWRM), which the Technical Advisory Committee of the Global Water Partnership (GWP-TAC) defines as follows:

“IWRM is a process, which promotes the co-ordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems” (GWP-TAC, 2000).

The distinction between “integrated” and “traditional” management of water and natural resources relies largely on the scope and sphere of operation of the two. “Traditional” management is typically sector-oriented (water supply, irrigation, agriculture, hydropower, etc.) and focused on satisfying the perceived demands within each sector. “Integrated” management, in contrast, attempts to take a cross-sectoral approach and focuses on the management of water and natural resources, as well as the demand, supply and use of water and natural resources (Gooch and Stålnacke 2006).

It is argued that the successful implementation of IWRM can prevent human health, economic and environmental losses that might hamper development and frustrate poverty reduction efforts. In addition, the participative processes that make up “good” IWRM can help developing countries to meet the millennium development goals (MDGs). The MDGs aim to address poverty, gender equality and health issues and also strive to attain environmental sustainability (Jonch-Clausen, 2004).

Operationally, and similar to INRM, IWRM approaches apply knowledge from several disciplines as well as multiple stakeholders to devise and implement efficient, equitable and sustainable solutions to water and development problems. As such, IWRM is a comprehensive, participatory planning tool that involves the coordinated planning and management of land, water and other environmental resources for their equitable, efficient and sustainable use (Calder, 1999). Key points here are process, coordination, and the relationship between sustainability and economic and social welfare. IWRM can be seen as consisting of five main characteristics that may cause complications and problems and necessitate action: Multi-functionality (e.g., fishing, farming, water supply), user interests and conflicts, multiple managers at different levels (e.g., local, regional, national), asymmetric power relations (e.g., up- and downstream users and managers), and technical complexity (Mostert, 1998).

3.2 Definition of integration

Having identified different possible approaches to integration of water and land management, it becomes important to establish a definition of “integration”. This definition is based on the discussion of the international approaches above but also specifically applies them to the issue of water allocation and land reform in the South African context. Integration can therefore be defined as follows: the degree to which policies formulated in one government department are harmonised or coordinated with policies developed in other government departments, other sectors, or acknowledge the interconnectedness of various resources and the degree to which inter-departmental coordination and communication take place in the implementation of said policies.

Integration therefore refers to policy harmonisation and coordination across government departments and sectors as a result of the recognition of the interconnectedness of different natural resources. Furthermore, integration entails acknowledging and taking into account

the diverse multi-actor landscape and consequent diverging interests and perceptions that make up the water allocation and land reform landscape in order to come to terms with the existence of multiple social and cultural norms that shape this landscape.

Integration as described here is important so that policies or programmes developed in one government department take into account the impacts on or of other sectors and do not operate in isolation from other sectors. In addition, coordination is not only imperative between different government departments and sectors, but also between different levels of government at the national, provincial and local levels.

4. Integration of land and water management in the context of a developing country

In terms of applying the concepts of IRM, INRM and specifically IWRM to developing countries, it is important to realise that no universal blueprint for IWRM exists. While certain basic principles are applicable universally, a number of factors affect their realisation and effective implementation in individual and specifically developing countries. These factors include the nature, character and intensity of water problems in individual countries, as well as human resources, institutional capacity, the relative strengths and characteristics of the public and private sectors, cultural setting, and the natural conditions present (GWP-TAC, 2000).

In addition, many of Africa's problems (and those of other developing countries) are uniquely "local", which may make it difficult for a "transplanted" solution to work. It is therefore important to ensure that the IRM, INRM and IWRM principles and specific practices that are implemented in an African country (or any other developing country) take sufficient account of local conditions to ensure they are sustainable and effective in the long-term (Ashton, 2007).

In terms of water reform in particular, which is of particular relevance for the South African context, it also seems to be difficult to overhaul water resources management and apply new legislation, strategies and institutions that are linked to paradigms such as IWRM in practice. These tasks often exceed the budgets and human resource capacities of most Southern African Development Community (SADC) states. It is also important to be aware of the largely political nature of water reform processes, such as proposing a profound realignment of decision-making power and decentralising management to the lowest possible level, in already fragile, underdeveloped states (Funke et al., 2007a). This statement is of particular relevance to the South African context not only in terms of water allocation reform, but also in terms of the land reform process and the shift in political and power dynamics that has played a part in the run up to and during the implementation of both of these processes. In addition, South Africa, similar to many other countries, has been struggling to implement IWRM for a number of reasons. These generally include an absence of relevant institutions (Catchment Management Strategies that are supposed to be the implementing agencies of IWRM), lack of coordination of available data, lack of capacity and skills, and lack of communication within the South African Department of Water Affairs (DWA) (Funke et al., 2007a). Therefore there seems to be a discrepancy between developing policy or paradigms that sound highly promising on paper and implementing these in practice.

5. The South African case study

South Africa is characterised by substantial socio-economic inequalities and inequitable access to water resources and land as a result of its historical legacy, coupled with challenging climatic conditions and problems of water management. It therefore makes for an interesting case study of the need for integrating approaches to water allocation and land reform as well as the consequences of non-integration.

5.1 Climatic conditions in South Africa

South Africa is a water scarce country. Although some parts of the country receive more rainfall than others, the country's average rainfall of 450mm per year is far below the global average which amounts to 860mm per year. In addition, factors such as climate change and international obligations to neighbouring countries with shared watercourses limit the amount of water that can be used (Claassen, 2010).

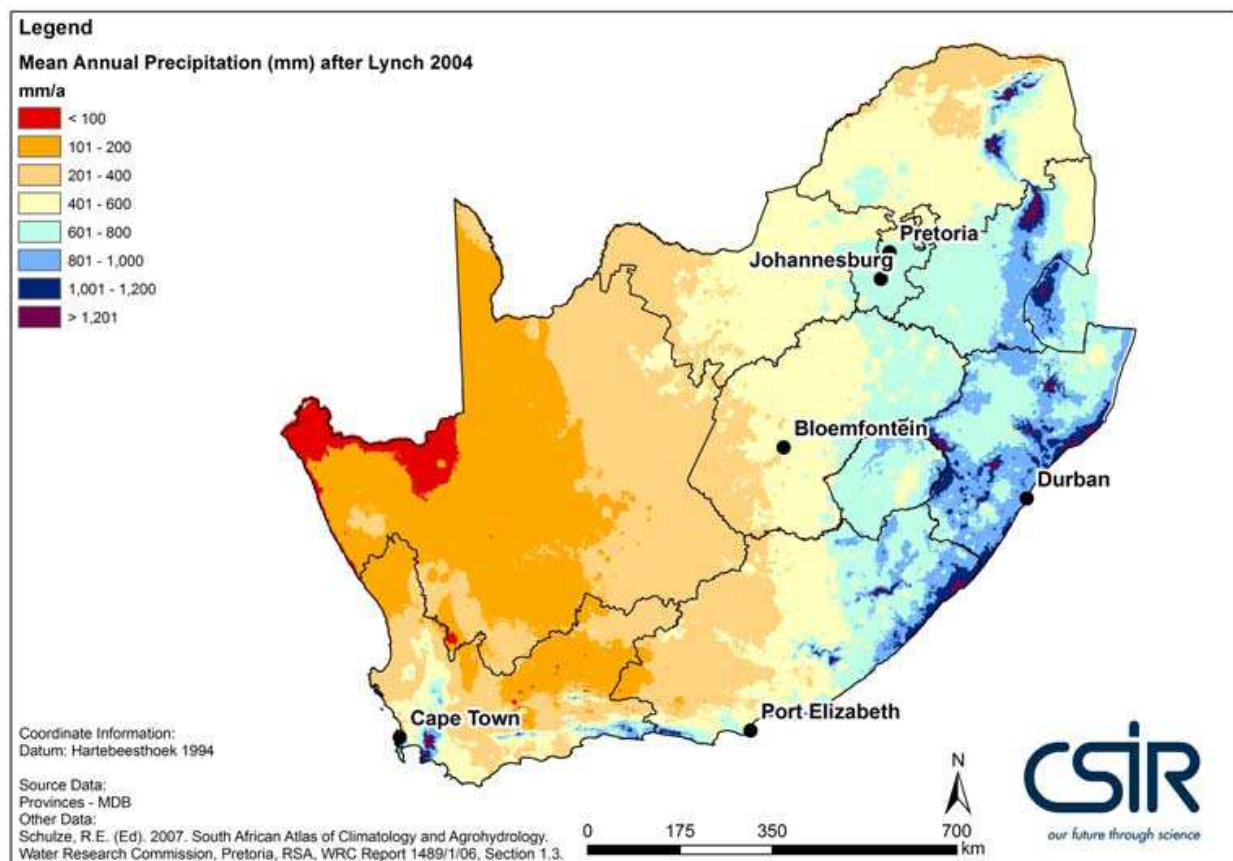


Fig. 1. South Africa's average rainfall (Maherry, 2010)

While South Africa has enough water to meet its needs in the immediate future, based on calculations of runoff, yield and water use, there is a growing demand for water, which is currently being met by the development of the country's surface water resources. South Africa's estimated mean annual runoff is 43 500 million cubic metres per annum (excluding the runoff from Swaziland and Lesotho), the total available yield is 13 227 million m³/a and for the year 2000 the total water use requirements were 12 871 million m³/a (Classsen, 2010).

In terms of water use, the water requirements of irrigated agriculture are an estimated 56% of the total annual water requirements of 22 045 million m³ surface and groundwater (Backeberg, 2007). Although the contribution of irrigation to total agricultural production varies according to crop type, most of this water is used for commercial food production in local and export markets. In South Africa, the total land area under irrigation is 1.3 million ha, of which 100ha are food plots and smallholder irrigation schemes. This land falls in various rainfall regions, with a highly variable average of 500mm per year. The two most important irrigation practices are permanent irrigation and the sprinkler method (Backeberg, 2006).

Region	Rainfall [mm]	Total [ha]	Type of irrigation			Method of irrigation		
			Perma- nent [%]	Supple- mentary [%]	Occasional [%]	Flood [%]	Sprinkler [%]	Micro [%]
1	<126	19174	92.5	0	7.5	66.6	8.3	25.2
2	126-250	161197	61.1	0.4	38.5	77.1	16.8	6.1
3	(251-500)	399278	86.7	7.7	5.7	42.8	43.6	13.6
4	(501-750)	488543	75.2	20.8	4.0	21.0	65.4	10.8
5	(>750)	221940	81.5	16.6	1.9	5.3	80.9	13.8
Total		1290232	78.3	13.1	8.6	32.8	54.4	11.8

Table 1. Total areas, type and method of irrigation in different rainfall regions (WRC, 1996)

Despite just enough water being available for current use, including agriculture, South Africa's water resources face political, social and economic pressures. These include having enough infrastructure to secure water during low rainfall periods and supply areas of high demand, growing enough food to supply the growing population and meeting the water demands of energy, industry and mining (Claassen, 2010). In addition, due to increasing urbanisation and higher standards of living, competing demands are experienced for domestic, mining and industrial water use (Backeberg and Odendaal, 1998). At present, most of the country's water supply has already been allocated, and the only "supply options" available are linked to re-allocations between different water use sectors (De Lange, 2010).

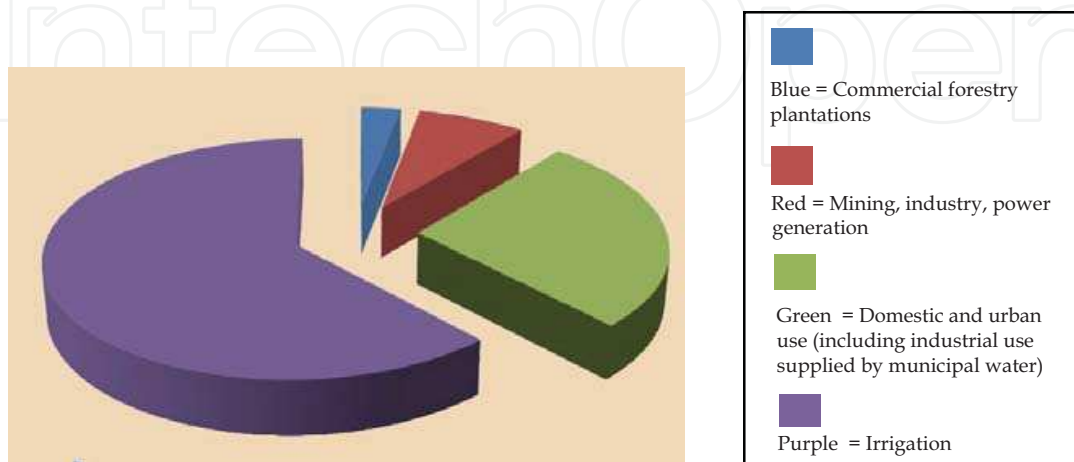


Fig. 2. Water use per sector (Strydom, 2010)

In addition to the above, the South African government also faces other challenges related to water governance. After coming to power in 1994, the post-apartheid South African government passed world class water legislation to address the backlog in water supply and sanitation, which it inherited from the apartheid government, and to manage South Africa's situation of water scarcity (Funke et al., 2007b). In combination, South Africa's Water Services Act of 1997 and National Water Act of 1998 were designed to "redress the inequalities of racial and gender discrimination of the past; link water management to economic development and poverty eradication; and ensure the preservation of the ecological resource base for future generations" (Schreiner et al., 2002).

However, to date, the implementation of this legislation has been slow and problematic (Funke et al., 2007b). Challenges include high staff turnover and lack of institutional capacity in numerous government departments, resulting in these departments being overburdened (Hattingh et al., 2004, Funke and Nienaber, in press); a disconnect between water supply and water resource management (more water is being supplied at the municipal level than is ecologically feasible) (Pollard and Du Toit, 2005); the inability of many municipalities to treat domestic sewage and industrial effluent to enable this to be safely discharged into rivers and streams (Ashton, 2010); a serious backlog in setting up South Africa's Catchment Management Agencies (Hattingh et al. 2004); and a focus on development at the expense of the conservation of freshwater ecosystems (Funke and Nienaber, in press).

In addition, the country is characterised by deteriorating water quality in its major river systems, water storage reservoirs and ground water resources, which results in social, economic and health risks to society (Ashton, 2010). Almost half of South Africa's 112 river ecosystems are currently at a level of critical endangerment.

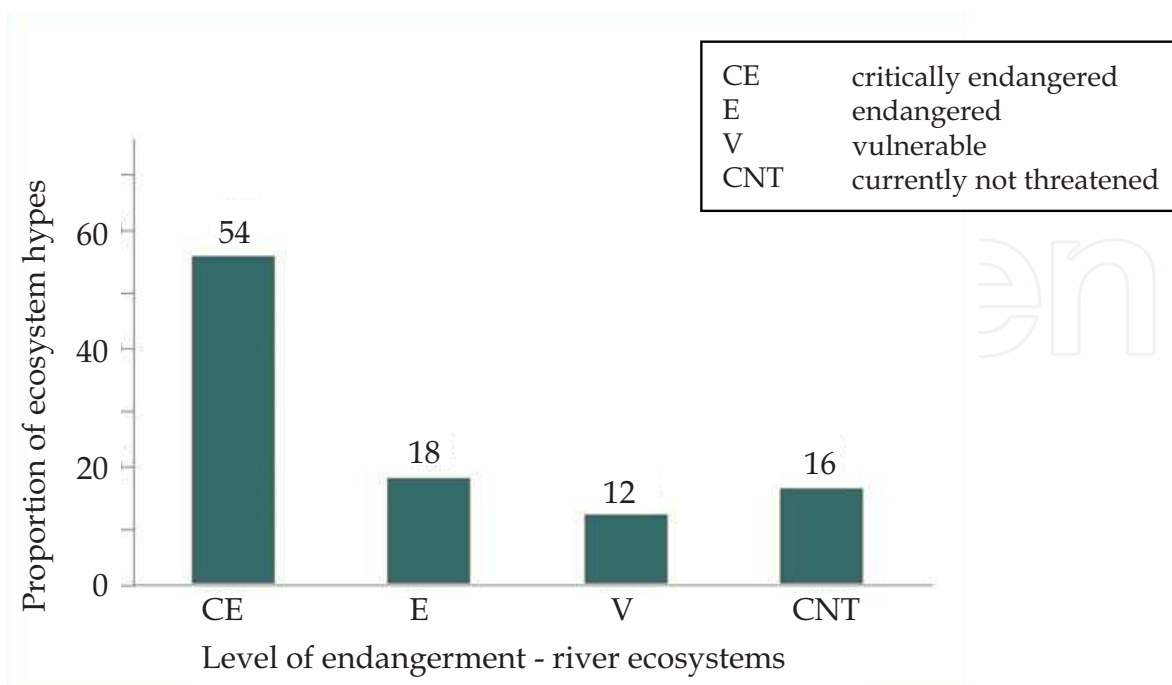


Fig. 3. Level of endangerment – river ecosystems (Nel, 2010)

One water governance related issue in particular that is of current interest and perceived national importance in South Africa is that of Acid Mine Drainage (AMD) (Hobbs, 2010). This issue has recently featured considerably in the country's newspapers and electronic media, where investigative journalists have flagged their concerns about it from various angles (Funke et al., in press). Acid mine water started decanting from abandoned underground mine workings close to Krugersdorp on the West Rand of the Gauteng Province in 2002. Now, the potential volume of AMD from the Witwatersrand Goldfield alone amounts to 350 MI/day (Hobbs, 2010).

AMD, or the uncontrolled discharge of polluted water from defunct gold mining operations into surface and ground water resources, presents a serious threat to the receiving environment and has severe socio-economic and environmental impacts. Specifically, these impacts include the release of chemical contaminants into water resources, persistent environmental damage long after mine closure, and negative impacts on the health and safety of communities living in the vicinity of mining operations (Hobbs, 2010). There is no indication that the AMD threat will subside in the foreseeable future as mining operations remain active throughout South Africa as evident on the map below.

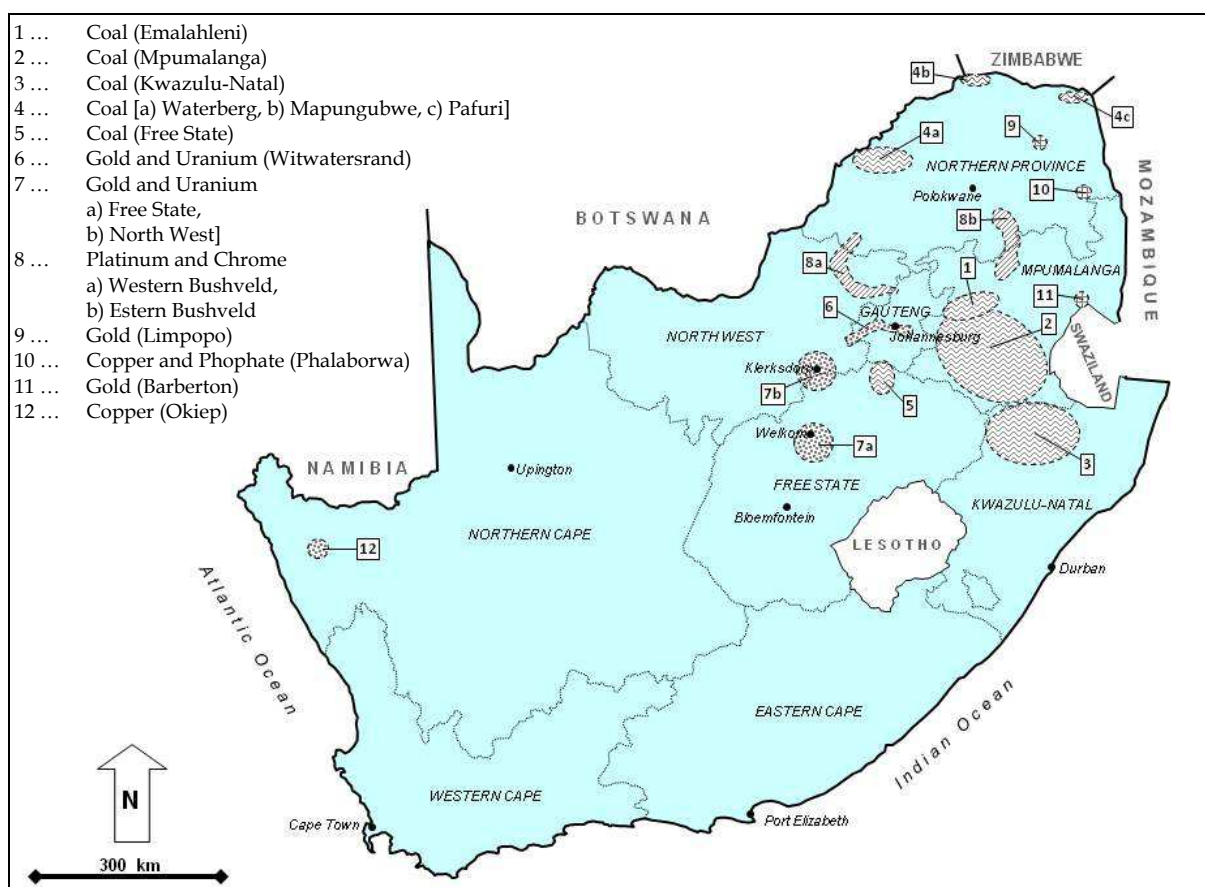


Fig. 4. Mining areas and minerals particularly susceptible to the formation of AMD (Hobbs and Kennedy, 2010)

Having sketched a picture of the climatic conditions in South Africa, an overview of water allocation and land reform in South Africa is presented to explain how the government chose to follow this reform path and what the results have been to date.

5.2 Overview of water allocation and land reform in South Africa

South Africa's political transformation formalised by the country's first democratic elections in 1994 brought with it a host of progressive reforms in the water and agricultural sectors. The Water Services Act was ratified in 1997 and the landmark National Water Act in 1998 (Republic of South Africa, 1998). The National Water Act is in line with other international reforms in water management. It prioritises decentralised water management and common property aspects of water; separates ownership of land from ownership of water; confirms the need to ensure that aquatic ecosystems receive sufficient water to function properly; stipulates the need to ensure that neighbouring states utilise shared water resources equitably; and prioritises the right of all South Africans to have adequate access to wholesome supplies of water (DWAF, 1997). The National Water Act is regarded, along with the EU Water Framework Directive (EU, 2000), as a pioneer of an international wave of reform and one of the most innovative and far-reaching water laws in the world, which has set the benchmark for new ways of managing water resources (Woodhouse, 2008; Ashton et al, 2008; Postel and Richter, 2003).

However, the necessary goal of redressing past racial and gender inequality means that South Africa's water reform is expected to deliver on changes in process (holistic, decentralised, participatory and economically cost effective), social outcomes (Woodhouse, 2008) as well as ensuring higher environmental standards as stipulated in the 1998 National Water Act. According to Woodhouse, "The prospect of redistribution from existing 'haves' to 'have nots' raises considerably the political risks and expectations attached to the implementation of reform" (Woodhouse, 2008: 3).

In line with the South African government's social redress priority, the land reform programme intends to transfer approximately 30% of white-owned commercial farms to "new" black commercial farmers by 2014 in an effective and sustainable manner (Cousins and Scoones, 2010). The land reform programme in the country has three different dimensions namely, land restitution, land redistribution and tenure reform. The restitution component of the policy aims to return land that was taken away forcibly from black people during apartheid, or to provide those affected with financial compensation. It targets both rural and urban lands. The land redistribution dimension aims to equitably share resources by transferring land from white to black people so that the land ownership share of black people is increased. This is considered necessary because black people make up the large majority of the South African population but have less land compared to the white population. For instance, in 1991 they held only about 13.9 % (17 million ha) of the national land (Lyne and Darroch, 2003). The land tenure reform dimension aims to enhance the tenure security of vulnerable people, such as workers and their families residing on private commercial farms as well as people living in the former homelands.

However, according to the Department of Rural Development and Land Reform's (DRDLR's) Strategic Plan for 2009-2012, by the end of the 2007/08 financial year the combined programme had only achieved 4.9 million ha. Cumulatively, from 1994 to the second quarter of 2008/09, the National Land Reform Programme had achieved just over 5.1 million hectares of land delivery. This means that from 1994 the yearly average output of 0.371 million ha has been less than one third of the expected 1.23 million required to meet the 2014 target. More importantly, it has been acknowledged that 90% of land reform projects on redistributed farming land have failed (Pressley, 2010).

In parallel to the land reform process, the water reform process has also been underway, with one of its central pillars being the Water Allocation Reform Strategy of 2008. Water Allocation Reform (WAR) aims to provide water for subsistence farming or for sustaining basic livelihoods, and to start a development path of commercial and competitive water use in support of broad based black economic empowerment. Thus the water allocation process must be undertaken in a fair, reasonable and consistent manner and existing lawful uses will not be arbitrarily curtailed (DWAF, 2006). Furthermore, the strategy aims to allocate 30% of available water to black people. By 2024 the target is 60%, half of which should be under control of black women.

Currently, 15% of water use licenses are allocated to historically disadvantaged individuals for irrigation purposes. By 2011/12 the Department of Water Affairs (DWA) plans to address the existing backlog of issuing licenses and is aiming to increase this target to 40% by 2013/14 (PLAAS 2009). DWA also wants to review progress towards integrated water, rural development and land reform by 2013/14 (PLAAS, 2009).

Compulsory licensing is an integral part of the Water Allocation Reform programme (DWAF, 2004). This allows for water currently allocated to users to be re-allocated to previously disadvantaged people. All commercial water users must now register their water use and will have to apply for a water use license (DWAF, 2004). In practice, however, not much re-allocation of water has occurred. In fact, the process of compulsory licensing has not yet started with only three pilot studies being carried out in various provinces. Similarly, of the 1212 ad hoc licenses for new water use that had been allocated by 2006, 98% were for non-historically disadvantaged individuals. Van Koppen et al. (2009) argue that for administration-proficient, larger-scale users, obtaining a license simply means submitting an application. The DWA appears to have very limited capacity to evaluate and judge each application on its own merits, check on-site or enforce the licensing process. Administrative pressure, and the proven threat that vested applicants can report any delays to the Water Tribunal, pushes officials towards allocating whatever is being asked for. The redistributive potential of water allocation reform risks fading away amid these legal complexities and to the detriment of small-scale users.

A parallel process to land and water sector reform is agricultural policy reform, which pays particular attention to irrigation policy. The overall objective of the agricultural policy reform process is to create more opportunities for smallholders and resource-poor farmers to improve productivity and contribute more to the mainstream economy. This notion was supported by the African National Congress (ANC)'s 2007 Polokwane conference, during which the importance was stressed of integrating smallholders into the formal value chain and linking them with markets. The problem is that there is insufficient support for the agricultural sector, which means that plans related to the agricultural sector cannot easily be carried out. This situation has not been helped by the fact that national government has reallocated resources from agriculture to other priority areas during the recent global economic depression. Agriculture is seen as a declining sector, as opposed to urban areas, which are seen as the future of the country (Greenberg, 2010).

So, despite efforts at socio-economic and political transformation, the legacy of apartheid policies has resulted in most available land and water for irrigation remaining in the hands of the large-scale commercial farming sector, low productivity levels of land transferred to beneficiaries of land reform, insufficient post-settlement support, very little knowledge by farmers of their use rights, and overall food security concerns to name a few.

Additionally, even though parallel processes of water allocation and land reform have been of high priority to the South African government, both have had less than satisfactory results. Water allocation and land reform processes have both had redistributive, socio-economic and social redress objectives, through which the South African government intended to make water and land vehicles for rural economic transformation. However, in many respects, the state has failed to live up to its reform objectives, facing backlogs, falling short of its targets, and contributing little to improving the productivity of beneficiaries of the water allocation and land reform programmes. A commonly cited reason for this failure is the uncoordinated nature of the land reform and water allocation reform policy formulation processes as well as the uncoordinated nature of their implementation. While the South African government has put in place several trans-sectoral instruments, procedures and principles to accommodate dual sectoral policy objectives, these two sectoral reforms still seem to operate in relative isolation of each other.

5.3 Problems with the land reform process

Problems with the land reform process include the fact that the land and water reform targets set at the national level have not been matched by meaningful implementation on the ground. The land reform programme in South Africa has been characterised by a slow pace of land redistribution and has failed to impact significantly on the land tenure systems prevailing on commercial farms and in the communal areas (Hall, 2009; Greenberg, 2010). In addition, the “willing-buyer-willing-seller” approach is only able to transfer modest amounts of land to a small minority of the rural population, while leaving the underlying structure of the agrarian economy largely intact (Walker, 2005). The perception exists that most of the land that has already been redistributed is not being used as productively as originally planned. There have also not been significant livelihood benefits for the majority of the beneficiaries (Lahiff, 2008; Cousins and Scoones, 2010; Greenberg, 2010). This is probably as a result of weak delivery systems and institutions, inadequate budgets, top-down implementation (with the high expectations of a passive citizenry) and very poor provision of agricultural support (Greenberg, 2010).

Another major shortcoming of the land redistribution process is the lack of resources made available for post-transfer support and adequate resources to beneficiaries (Turner and Ibsen, 2000; Cousins, 2005). Various studies have shown that beneficiaries experience severe problems accessing services such as credit, training, extension advice, transport and ploughing services, veterinary services, and access to input and produce markets (HSRC 2003; Hall 2004; Bradstock 2005; Lahiff 2007). Other challenges include the types of beneficiaries accessing the programme, drawn out transfer periods, lack of transparency and possible illegitimate activities of local government institutions, the often inappropriate models of land-use being imposed on beneficiaries, the general failure of post-settlement support and, ultimately, the generally disappointing performance of land reform projects (Aliber and Mokoena, 2000; CASE, 2006). In addition land may be transferred to groups who may not be interested in agriculture or have any agricultural experience, rather than motivated, interested and experienced individuals (De Lange et al., 2004). Farms are also often transferred in their entirety, rather than divided into smaller, more manageable units for small-scale farming purposes (Van Koppen, 2009).

In terms of training emerging farmers, a number of difficulties exist. Agricultural training colleges have been characterised by low student numbers, which has meant a shift from

training extension officers to training farmers directly. The Agricultural Sector Education and Training Authority (AgriSETA) was established to provide work-based, functional training in agriculture. This institution is flooded with requests for training assistance from both farm workers and land reform beneficiaries. However, it only approves very few of these applications. For instance, in 2006/07 AgriSETA received 16245 applications for learnerships (only 400 were approved) and 59000 applications for skills programmes (only 475 were approved) (Greenberg, 2010).

In addition, the public agricultural extension office has declined over the past 15-20 years. In 2008, 2152 agricultural extension officers, who assist farmers and land reform beneficiaries, were active in South Africa. Of these 60% were working in the Eastern Cape and Limpopo. There is currently a ratio of one officer to 878 farmers (which is comparable to India, Zambia and Zimbabwe who face similar agricultural issues). The Department of Agriculture Forestry and Fisheries (DAFF) has an Extension Recovery Plan in place which is aimed at reviving public extension services by increasing numbers and reskilling public extension officers. This initiative is however not planned or budgeted for in all provincial departments. The potential role of community-based extension workers as auxiliaries can also be considered (Greenberg, 2010).

In terms of power asymmetries in the agricultural sector, an alliance of conservative landowners, agricultural economists, officials and analysts has been promoting the need for sustainable commercial viability among emerging farmers (Doyer, 2004). This orientation does not sufficiently capture and address the historical inequities of land and water ownership and rural poverty (Vink and Van Rooyen, 2009; Walker, 2005). The 2005 National Land Summit tried to address this problem by calling for land redistribution to be embedded within a wider agrarian reform process that focuses on poverty reduction and creating opportunities for smallholder farmers. This idea has however not been developed in more detail and it is not clear what this may mean for beneficiary selection, programme design, post-transfer support and agricultural policy in general (Lahiff, 2008). The weaknesses mentioned above reflect deep-seated structural and implementation shortcomings as well as inappropriateness of current redistribution models.

Another challenge is the role of traditional leaders, which has not been clearly defined. Traditional leaders continue to perform unregulated land administration functions outside of any legal framework. These functions would otherwise exceed the capacity of local government. As a result, functions of traditional leaders are not matched or aligned to the planning and development functions of elected local government, which in some cases is resulting in a stand-off between these two institutions. It is therefore important to find a solution to this issue (Manona, 2009).

5.4 Problems with the water reform process

In terms of water reform, gaps in access to water appear even wider than gaps in access to land. 95% of water for irrigation is primarily used by large-scale commercial farmers, while smallholders have access to the remaining 5%. New users therefore have to compete for the available water with well-entrenched users. Irrigated agriculture is the main user, taking up 72% of the available water resources. Water re-allocation is therefore one component of a wider mandate to address the inequalities of the past (Anderson et al., 2008).

In addition, very few water-use licenses have actually been awarded and taken up by emerging black commercial farmers. This means that farmers often have to put production on hold until a license is granted even though other infrastructure may be in place (Surplus People Project, 2007). Evidence is also increasing that many water and land reform projects are not leading to meaningful and efficient productivity on most of the “new” black-owned irrigated farms. The challenge is, amongst others, to synchronise reform programmes in irrigation areas and ensure that beneficiaries hold secure land and water use entitlements.

According to Van Koppen et al. (2009), in implementing land restitution and redistribution as part of the land reform programme, there was at first little collaboration between the former Department of Land Affairs (DLA) (now Department of Rural Development and Land Reform) and the former Department of Water Affairs and Forestry (DWAF) (now Department of Water Affairs). Riparian water rights were not always completely registered as part of the land entitlement. Also, in a few cases, water rights tied to land under claim were sold, leaving an asset of lesser value. Without readily available registers of land under claim, the DWAF could not easily track this problem. In the late 1990s, however, it introduced a policy that the trading of water rights of land under claim should not be approved. Further coordination has since been established between the DWAF, the provincial Departments of Agriculture and the provincial governments with the signing of a memorandum of understanding on collaboration on land and water reform in 2008.

There have also been arguments that question the wisdom of transferring land and water to beneficiaries who may not be able to use it productively. According to such narratives, attempts to address equity needs must be balanced with the consideration that many existing lawful water users are making productive, efficient and beneficial use and are contributing to socio-economic stability and growth (Adger et al., 2001; Forsyth, 2003). There is also an argument that if reallocations take place too quickly, the result is likely to be economic and environmental damage as emerging users struggle to establish productive uses of the reallocated water (Forsyth, 2003). These narratives have influenced government thinking and contributed to the maintenance of the status quo instead of rapid allocation of water use entitlements to the “new” farmers.

Another factor affecting the uptake of water use entitlements is that many emerging farmers are not sufficiently capacitated to understand their water needs, the scales and rates of payment for water rights, use and management of water or their roles and responsibilities on Water User Associations. On the other hand, large scale commercial farmers who have historically used water for productive purposes are more knowledgeable about administrative processes and can easily apply and obtain water licenses. It is therefore important that the capacity constraints experienced by emerging farmers be recognised and addressed if they are to begin to make a more meaningful contribution (Surplus People Project, 2007).

In cases where new farmers start irrigating their lands, they often do not properly determine the optimum irrigation potential of their farms. This means that chances for under-utilisation are high (Backeberg, 2005). In addition, Joubert and Kruger (2005) attribute the high failure rates of the new farmers to inadequate appraisal of farm potential (e.g. marginal farms that have been offered for sale), and unrealistic business plans designed by consultants who are only interested in maximising their commission paid by government, and which do not provide sufficient guidance to new farmers.

The apartheid government invested heavily in infrastructure (including dams, irrigation schemes, private pumps and farm dams) for white farmers as well as black smallholder irrigation. However, after 1994 state support to white irrigators declined, although at a much smaller scale than for smallholder irrigators, who suddenly lost almost all government support. Many smallholder schemes collapsed and the recent revitalisation efforts have not yet produced any results. The DWA and former DoA (now Department of Agriculture, Forestry and Fisheries) have undertaken some commendable efforts to promote water harvesting at homesteads for food security, but these efforts are still too marginal in numbers and volumes to really redress the problems that smallholder irrigators are facing. Without government champions to boost infrastructure development for small-scale water users, the prospects of achieving the WAR targets remain gloomy (Van Koppen, 2009).

Important competitors for water for smallholder irrigation are water for urban, energy and industry purposes, as well as water for the environment (the Ecological Reserve is provided for in the National Water Act). As a result, many urban-biased water resource managers tend to perceive the use of water for small-scale farming as an “unproductive” use (Van Koppen, 2009).

5.5 The importance of integrating water allocation and land reform for South Africa

Given the problems characterising the land and water reform processes, as discussed above, the integration of these processes has been supported by a number of authors.

Greenberg (2010) states that there is a realisation at the highest levels of government that the link between land reform, agricultural support and water resource provision is weak. There is thus a need to invest in irrigation, both for commercial and for resource-poor farmers, and also to link water provision to the land transfer process. It is essential to ensure that water is available to land reform farms and this must be built into the planning stages at the outset of the transfer process. Many land reform farms have failed as a result of water not being available for production. It is important to improve the synchronisation between water and land reform programmes in irrigation areas to ensure that beneficiaries hold secure land and water use rights, once they have been allocated the land (Groenewald, 2004). Derman (2005) argues that the distinction made between land and water in the reform programmes does not fit with local conceptions of livelihoods, or the increasing evidence of the importance of the land-water interface, including natural wetlands and irrigation systems.

The lack of linkages between water allocation and land reform policies has resulted in “dry”, unsustainable land reform projects. There is therefore a need to align land and water reform programmes at both the policy and programme level, as both programmes are the cornerstones of the South African rural development strategy. Addressing this integration requires leaders in the land and water sectors to establish joint think-tanks aimed at finding workable solutions that enhance both programmes in pursuit of a sustainable rural development path (Greenberg, 2010).

Here it can be argued that while the integration of the land and water allocation reform processes is imperative, it may not be sufficient to ensure the successful functioning of the two processes. A number of other challenges have to be addressed, once the beneficiaries’ basic needs and challenges have been identified. There may also be a need to develop a wider understanding and appreciation of water for productive uses at sustainable

livelihoods levels and how this can impact on the quest for equity (Chikozho and Jacobs, 2010). Services that need to be provided include extension, training, credit/finance, marketing, inputs, infrastructure, management labour, capital equipment and provision of facilitation and strategic services that are appropriate to emerging farmers (Walker, 2005). Additional support structures that are needed are secure land title deeds, secure water/rights licenses, physical infrastructure such as water supply systems and roads, soft loans, markets, fertilizer, irrigation machinery, seeds, energy, information and research (Chikozho and Jacobs, 2010). There is also a need for the development of a coherent vision of equitable redistribution of water and sustainable economic transformation. This necessitates developing effective institutional mechanisms (that would need to differ from failed integration attempts in the past) that link water management to agriculture, land, finance and other support systems (Van Koppen et al., 2009).

Government departments and agencies have to create an enabling and supportive environment for new farmers in terms of infrastructure and institutional development. The greatest challenge in the reform processes is how to implement them and to ensure that the stated objectives and targets are met in a sustainable manner (Chikozho and Jacobs, 2010).

It is also important to consider not merely reproducing and expanding on the current commercial agricultural model in South Africa, but to take into account lessons from the past to build a more equitable agricultural model in South Africa which will not lead to a repeat of the mistakes of dispossession or environmental degradation (Chikozho and Jacobs, 2010). Transformation of the agrarian sector from its current extractive commercial form to a more equitable and sustainable form is key (Chikozho and Jacobs, 2010).

What form could an alternative agricultural model in South Africa take and importantly how could this realistically be implemented? While deracialisation of the agricultural industry is necessary, it is not sufficient. Ideas around the multifunctionalism of agriculture and food security suggest that food production is perhaps only one of the functions of agriculture. Other elements that are equally important and that complement the notion of needs-based smallholder agriculture are sustainable livelihoods, living landscapes and environmental integrity, which are all integral to rural sustainability (Greenberg, 2010).

5.6 Critical review of government policies to address the challenges to water allocation and land reform

South African government departments have attempted to increase the implementation of water allocation and land reform by coming up with a number of programmes. Here follows a critical review of each of these efforts followed by a summary describing to what extent they have been successful.

5.6.1 Comprehensive Agricultural Support Programme (CASP)

The Comprehensive Agricultural Support Programme (CASP) (2003) is the biggest sub-programme at the provincial level in all provinces except Gauteng and the North West Province (Greenberg, 2010). The CASP is designed to help black farmers to participate in a market that is dominated by white agri-business, but without altering the logic of the market or production system. The money that is awarded as part of the CASP is used mainly for infrastructural development i.e. warehouses, access roads, irrigation systems.

Money is also spent on training and capacity building and marketing. Farmers apply on a yearly basis and grants are awarded for a five year period (DAFF, 2011a). The CASP is therefore a potentially very valuable support programme as it is meant to supply emerging farmers with much needed infrastructure.

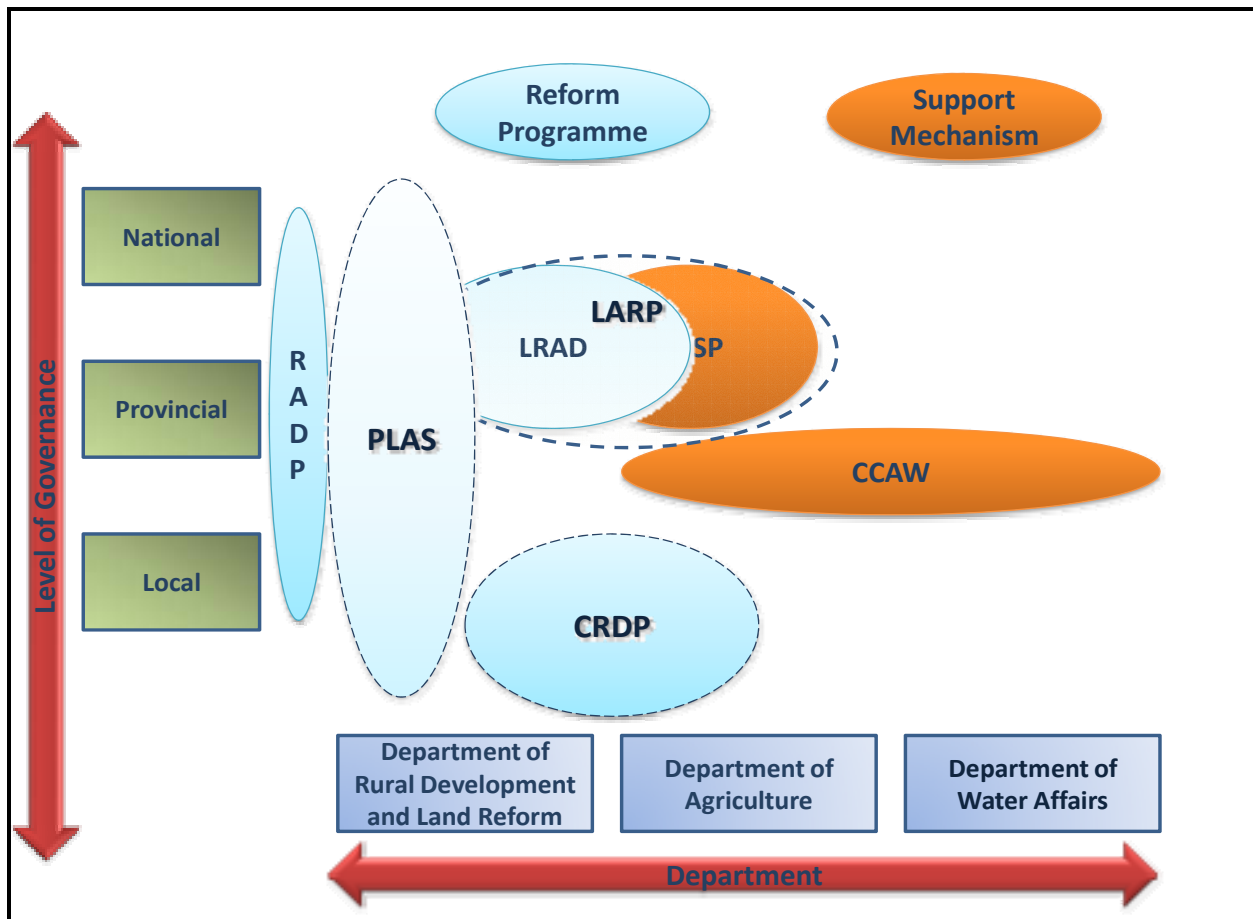


Fig. 5. Conceptualisation of transsectorality of reform programmes and support programmes

The South African Department of Agriculture, Forestry and Fisheries (DAFF) monitors the success of the impact of the CASP by checking whether the infrastructure that has been promised has been completed, and whether farmers are using it for the right purpose. While it is important to monitor whether infrastructure is being provided, no impact assessment studies have been conducted to establish the success of the CASP (DAFF, 2011a). When the former Department of Agriculture and the former Department of Land Affairs (now the Department of Rural Development and Land Reform) fell under one minister, it was easier to ensure that the land reform financial support programmes of both departments were coordinated. This has become more difficult now that the two competencies are no longer governed by the same minister (DRDLR, 2011a). Therefore, there used to be a greater level of transsectorality between the agriculture support specific and land reform specific programmes, which has now been compromised.

To date, the success of implementation of the CASP programme has been uneven, although most provincial farmer support programmes have been expanded (Greenberg, 2010). It

appears that currently the CASP needs between three and four times its current budget in order to function effectively. Other difficulties include farmers not being aware of the different funding options they qualify for, the complicated nature of the government procurement process and the non-alignment of funding between different government departments (DRDLR, 2011a). In addition, it can take a number of years for a CASP application to be successful. This is problematic for new beneficiaries who want to start farming immediately and cannot wait years for financial support to set up infrastructure or use the money for other purposes (Raholane and Baloyi, 2011).

5.6.2 Land and Agrarian Reform Programme (LARP)

The government has attempted to integrate the CASP (the agricultural support programme) with the Land Redistribution for Agricultural Development (LRAD) programme (which focuses primarily on land reform) in the form of the Land and Agrarian Reform Programme (LARP), which was established in 2008 (Greenberg, 2010). The LARP is meant to offer collaboration on delivery and collaboration on land reform and agricultural support “to accelerate the rate and sustainability of transformation through aligned and joint action of all involved stakeholders”. The idea is to have “one stop shop” service centres in close proximity to farms and beneficiaries (LARP, 2008). Implementation of the LARP has been slow and to date there is little evidence of any significant change in practice (Greenberg, 2010). This programme again demonstrates an attempt at coordinating different sectors – agriculture and land – and services from these sectors to serve beneficiaries of land reform with a large focus on stakeholder involvement.

5.6.3 Comprehensive Rural Development Programme (CRDP)

A subsequent attempt by the South African government to integrate agricultural support, land reform and broader rural development without putting more money into rural areas has been the Comprehensive Rural Development Programme (CRPD) (CRDP, 2011). Again, this is an attempt at transsectoral coordination between agriculture and land, this time with an additional focus on broader rural development. The programme aims to achieve “co-ordinated and integrated broad-based agrarian transformation, an improved land reform programme and strategic investments in economic and social infrastructure in rural areas” (CRDP, 2011). It is likely that this programme will run into difficulties as it relies on the weak institutions of the former Department of Land Affairs (which now is the Department of Rural Development and Land Reform with a bigger mandate but not a bigger budget). It also appears that the approach to planning and implementation is rushed with a focus on immediate delivery at all costs. The consequences of this approach are poor quality and lack of sustainability. Policy-making continues to be dominated by agri-business, which exerts a strong influence on the agricultural sector (Greenberg, 2010).

5.6.4 Pro-active Land Acquisition Strategy (PLAS)

An important component of revising the land reform programme has been the Proactive Land Acquisition Strategy (PLAS). This programme currently involves approximately 1000 farmers. As part of the programme, land is leased out to beneficiaries for a trial period of three to five years during which they have to prove that they can productively use the land for agricultural purposes. This programme has been in place since April 2010 (DRDLR,

2011b). One of the potential benefits of this programme is that it moves away from handing over land ownership rights to beneficiaries, which has often led to failure in terms of productivity in the past, and instead requires beneficiaries to prove that they are able to be productive by leasing land to them for a limited trial period. Beneficiaries have complained that this programme sets them up to fail and that the absence of a title deed makes it impossible for them to get financial assistance from banks. A reference group has been formed to further investigate the matter. It is still to be decided whether beneficiaries will eventually be able to own the land that is leased to them (DRDLR, 2011b).

As part of PLAS, grants to the value of 25% of the value of the land are to be awarded. This award will be once-off for now, but it is planned that in future it will be invested over a period of five years. This will take the form of a pyramid scheme with most of the money being awarded in Year One, and then less and less with farmers co-investing more of their own money over the next five years. The idea is not to give aid to the emerging farmers/beneficiaries but to teach them to farm on their own (DAFF, 2011a).

In addition, to aid emerging farmers, it is planned that they will team up with strategic partners, namely established commercial farmers, who will share in the profits and risks of the new enterprises. This partnership is regulated by means of an agreement between the strategic partner (farmer), the beneficiaries and the DRDLR (DAFF, 2011a).

Strategic partners are supposed to oversee activities on farms, ensure that the sowing and harvesting happens when it is supposed to, repair infrastructure, ensure that water allocations are paid for etc. The involvement of strategic partners has worked well in some cases as these partners often have in-depth knowledge of the ins and outs of commercial farming and are therefore able to ensure that productive farming takes place. This approach can however also be problematic as it can in some cases engender an over-reliance of beneficiaries on the strategic partner, as the partners often take over the management of the farm completely and also often leave the farming operation after their five-year contract has expired. This leaves the beneficiary with little new knowledge of how to manage a farm and also deprives them of the independence of managing the farming operation on their own (DAFF, 2011b).

5.6.5 Recapitalisation and Development Programme (RADP)

In response to the implementation challenges of CASP as well as the Settlement and Implementation Support (SIS) Programme, the DRDLR introduced the RADP to address programmatic weaknesses, such as the lack of monitoring for example. The RADP applies to all emerging farmers needing support and future land transactions, and aims to ensure increased production and food security; to graduate small farmers into commercial farmers; to create employment opportunities in the agricultural sector; to promote capacity building through training and mentorship; and to establish rural development rangers (DRDLR, 2010). The programme is to be sustained by the Recapitalisation and Development Fund (RDF), created from 25% of the baseline land reform budget per annum (DRDLR, 2010), and replaces the following land reform grants:

- The 25% PLAS Operational Budget
- The 25% Household Development Grant
- The 25% Restitution Development Grant

- The Restitution Settlement Grant
- Commonage Infrastructure Grant

Additionally, it places an emphasis on compliance to strict monitoring criteria. In this regard, it “will issue stringent conditions for those who qualify to benefit from it so as to avoid creating a culture of entitlement from unscrupulous individuals who are in it, for personal gain (DRDLR, 2010: 4).

5.6.6 Coordinating Committee on Agricultural Water (CCAW)

CCAW is a non-statutory cooperative government structure that serves as a provincial mechanism for joint effort between the Departments’ of Water Affairs, Agriculture and DRDLR. Its objective is to ensure that government-funded projects are sustainable from a water utilisation, agricultural engineering and economic perspective. Projects submitted have to be evaluated to determine their feasibility and sustainability. Ultimately, the CCAW should also be responsible for the evaluation of any water use license application that is submitted to the DWA, however, the status and effectiveness of each provincial CCAW varies from functional to non-existent. Some have therefore not taken on this evaluating task, in which case it falls to the DWA.

5.6.7 Evaluation of “Integration” programmes

Each of the above efforts has been an important attempt at integrating the land and water allocation reform processes more closely. It is imperative for the different government competencies to work more closely together, and also to find ways of adjusting the current land and water allocation reform models to try and address some of the shortcomings of past attempts at effective water and land reform. Initiatives such as leasing out land until farmers can show that they are able to be productive with sufficient government support in terms of infrastructure and cooperation with strategic partners are potentially very valuable.

Unfortunately, however, to date none of the programmes seems to have been functioning ideally. The problem has been that attempts at integration between the water allocation and land reform processes have been fraught with difficulties, often linked to the design of the different programmes as well as the organisational weaknesses at the governmental level.

Such difficulties include budgets for water allocation and land reform programmes being housed in different departments and funding not being coordinated, underfunding for certain programmes, a lack of monitoring capacity by government departments to establish how well the programmes are being implemented and whether they are successful, a lack of awareness among emerging farmers about which funding options are available to them, a “quick fix” approach with not sufficient attention being paid to quality programmes and quality implementation, an overreliance by the government and emerging farmers on strategic partners.

In addition, different government departments generally do not communicate effectively with each other, do not know who they need to be speaking to in their sister departments and have no clear idea of what activities other government departments are engaging in. In addition to challenges of inter-departmental cooperation and coordination, there is also a problem with intra-departmental communication as decisions that are made at ministerial

level, specifically in this instance those regarding cooperation with other departments, do not filter down to the lower levels of government. The top-down ways in which decisions are made therefore impact negatively on cooperation between operational managers in different government departments. Conversely, if government officials at the operational level wish to collaborate more closely, it becomes difficult for them to obtain the approval for such cooperation from their superiors, given the substantial amount of bureaucratic red tape that South African government departments are characterised by.

6. Conclusion

Given that integration of water allocation and land reform is very important but at the same time also a problem in South Africa, not only in terms of policy development but also in terms of implementation, what recommendations can be given for more effective integration of these two processes in future? In addition, what lessons does this chapter provide to other countries in terms of the impacts of non-integration and the challenges to successfully implementing integrated reform programmes?

With the Departments for Water Affairs and Rural Development and Land Reform (DWA and DRDLR) jointly acknowledging the importance of joint water allocation and land reform (Kleinbooi, 2009), there is a renewed onus on the South African government to achieve higher levels of integration between these two processes. The question now remains how this can best be achieved.

Integrated water allocation and land reform needs to go beyond quick-fix attempts to try and merge different existing programmes, and instead has to focus on identifying the root causes of why existing programmes are not working and how these causes can best be addressed. It is of course also important to ground any water and land reform integration programmes in the context of the South African legislative framework to ensure that the ethos of the country's progressive legislation is adhered to. Noticeably, existing trans-sectoral coordination efforts seem to have focused mostly on collaboration between the departments (DAFF, DRDLR and DWA). Other government departments that might also have an important role to play, such as the Department of Environmental Affairs (DEA), in terms of the environmental sustainability of agricultural practices, and the Department of Cooperative Governance and Traditional Affairs (DCGTA), perhaps need to be more involved.

In addition, three important premises can be identified to achieve more effective integration between the water allocation and land reform processes in South Africa? Firstly, it is important to acknowledge the multiplicity of the actor landscape and the presence of different stakeholder perspectives, linkages and interdependencies with other resources and sectors as a starting point. This may involve bringing on board other key stakeholders such as macro- and micro- lending institutions (for example, the Land Bank), commercial farmers who function as "strategic partners", irrigation boards, water user associations, land reform beneficiaries, and members of civil society, to try and find more innovative and inclusive solutions to address the need for integration. By determining the needs of stakeholders on the ground, it may be easier to establish how coordination between different parties may function more effectively. What should be key for government departments when involving a range of stakeholders is knowing when to solicit whose inputs and doing so strategically

to prevent themselves from being overwhelmed by too many inputs all at once as this could be counter-productive.

Secondly, different government structures need to stop working in silos and need to start cooperating in terms of budget allocation and promoting integration.

Thirdly, there needs to be an acknowledgement that increased levels of integration and communication can take a long time, which necessitates patience, endurance and a long term vision on behalf of those who are seeking to improve integration.

Other countries can also benefit from this analysis by taking note of some of the impacts of non-integration of water and land management related programmes and the challenges to successfully implementing integrated reform programmes. The impacts of non-integration include governments having to deal with the effects of failed programmes and stakeholder collaboration, and the simultaneous manifestation of a disjuncture between policy and practice. Another impact is that failed integration efforts cause promising paradigms such as IWRM to lose credibility, both at the national and international level. It seems so difficult to implement integration focused water and land management programmes because of the bureaucratic culture of managing projects and programmes in silos. Implementation is furthermore impeded by government structures traditionally being hierarchical and compartmentalised and making it difficult for information to flow freely and easily between different units within government. Therefore there is a need in South Africa and elsewhere, when promoting greater levels of integration between water and land management related programmes, to try to ensure that different government structures work together both horizontally across sectors, and hierarchically from the national to the local level. In addition, a multi-stakeholder and multi-sectoral effort is required at all levels, from the local to national if integration is to be operational and implementable.

7. Acknowledgment

The authors would like to thank the South African Water Research Commission (WRC) for the role they have played in soliciting and funding a research project on which this paper is loosely based. The case study and contextual background study is based on work conducted in this project, "An Investigation of Water Conservation in Food Value Chains by Beneficiaries of Water Allocation Reform and Land Reform Programmes in South Africa" (K5/1958/4). More information on these and similar projects can be found at the WRC's website: <http://www.wrc.org.za/>

8. References

- Adger, N. W., Benjaminsen, T. A., Brown, K. and Svarstad, H. (2001). Advancing a political ecology of global environmental discourses. *Development and Change* Vol. 32 No. 4, pp. (687-715), ISSN 0012-155X.
- Aliber, M. and Mokoena, R. (2000). *The land redistribution programme and the land market*. Department of Land Affairs, Unpublished paper, Pretoria.
- Anderson, K., Kurzweil, M., Martin, W., Sandri, D., Valenzuela, E. (2008). Measuring distortions to agricultural incentives, revisited. World Bank Policy Research Working Paper 4612, April 2008, Washington.

- Ashton, P.J., 2007. The Role of Good Governance in Sustainable Development: Implications for Integrated Water Resources Management in Southern Africa. In: Turton, A.R., Hattingh, J., Maree, G.A., Roux, D.J., Claassen, M. and Strydom, W. (eds.), *Governance as a Dialogue –Government-Society-Science in Transition*, pp. 78-60, Springer-Verlag, ISBN 978-3-540-46265-1, Berlin, Germany.
- Ashton, P.J., Hardwick, D., and Breen, C. (2008). Changes in Water Availability and Demand Within South Africa's Shared River Basins as Determinants of Regional Social and Ecological Resilience. In: *Exploring Sustainability Science: A Southern African Perspective*, M.J. Burns and A.v.B. Weaver (Eds), Stellenbosch University Press, ISBN 978-1-920109-51-6, Stellenbosch.
- Ashton, P.J. (2010). The road ahead. In : A CSIR perspective on water – 2010. CSIR Report No. CSIR/NRE/PW/IR//2011/0012/A. ISBN 978-0-7988-5595-2, Pretoria, CSIR.
- Backeberg, G.R. (2005). Water institutional reforms in South Africa. *Water Policy* Vol. 7 (2005), pp. (107-123), 1366-7017.
- Backeberg, G.R. (2006). Reform of user charges, market pricing and management of water: problem or opportunity for irrigated agriculture? *Irrigation and Drainage* Vol. 55 (2006), pp. (1-12).
- Backeberg, G.R. (2007). Allocation of water use rights in irrigated agriculture: experience with designing institutions and facilitating market processes in South Africa. Paper presented at USCID 4th International Conference on Irrigation and Drainage; 5 October 2007; Sacramento, California, USA; Copyright © 2007, US Committee on
- Backeberg, G.R. and Odendaal, P.E. (1998). Water for agriculture: a future perspective. Proceedings of the 39th Ordinary General Meeting of the Fertilizer Society of South Africa (FSSA). 24 April 1998. Sun City Hotel. Pilansberg. FSSA Journal. Pretoria. Irrigation and Drainage.
- Bradstock, A. (2005). *Key experiences of land reform in the Northern Cape Province of South Africa*. Policy and Research Series, FARM-Africa, ISBN: 1 904029 02 7, London.
- Calder, I.R. (1999). *The Blue Revolution: Land Use and Integrated Water Resources Management*. Earthscan, ISBN 1-85383-634-6, London, U.K.
- CASE (Community Agency for Social Enquiry) (2006). Assessment of the status quo of settled land restitution claims with a developmental component nationally. Research conducted for the Monitoring and Evaluation Directorate, Department of Land Affairs.
- Chikozho, C. and Jacobs, I. (2010). The key factors and variables influencing water allocation and land reform programmes in South Africa. Position paper for WRC project KC/1958/4.
- Claassen, M. (2010). How much water do we have? In :A CSIR perspective on water – 2010. CSIR Report No. CSIR/NRE/PW/IR//2011/0012/A, ISBN 978-0-7988-5595-2, Pretoria, CSIR.
- Cousins, B. (2005). Agrarian reform and the 'two economies': transforming South Africa's countryside. In: *The land question in South Africa: the challenge of transformation and redistribution*, Hall, R and Ntsebeza, L (Eds), HSRC Press, ISBN, 0796921636, London.
- Cousins, B. And Scoones, I. (2010). Contested paradigms of viability in redistributive land reform perspectives from southern Africa, *The Journal of Peasant Studies*, Vol. 37, No. 1 (2010), pp. (31-66), ISSN 0306-6150.

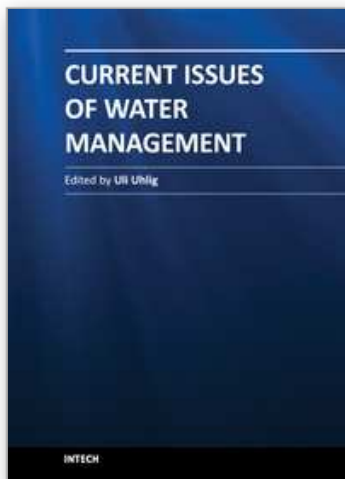
- CSIR (2010). *A CSIR perspective on water in South Africa – 2010*. CSIR Report No. CSIR/NRE/PW/IR/2011/0012/A, ISBN 978-0-7988-5595-2.
- De Lange, A. Swanepoel, F., Nesamvuni, E., Nyamande-Pitso, A. and Stroebel, A. (2004). *The evaluation of empowerment policies, strategies and performance within the agricultural sector: Executive summary*. University of the Free State, Bloemfontein.
- De Lange, W. (2010). *The water situation in South Africa: some inconvenient truths*. In: *A CSIR perspective on water – 2010*. CSIR Report No. CSIR/NRE/PW/IR//2011/0012/A, ISBN 978-0-7988-5595-2, Pretoria, CSIR.
- Department of Water Affairs and Forestry (DWAf) (1997). *White Paper on a National Water Policy for South Africa*, Government of the Republic of South Africa, Pretoria.
- Department of Water Affairs and Forestry (DWAf) (2006). *A strategy for water allocation reform in South Africa*. DWAf, Pretoria.
- Derman, B. (2005). *The incredible heaviness of water: Water policy and water reform in the new millennium in Southern Africa*. In: *Globalization, water and health: resource management in times of scarcity*. Pp. 209-230. Whiteford, S., and Whiteford, L. (Eds), James Currey Publishers, ISBN 0-85255-974-7, Oxford.
- Doyer, T. (2004). *BEE: A call for calm*. *Farmer's Weekly*, 13 August 2004: 8.
- European Union (EU) (2000). *Water Framework Directive*, 20 July 2011. Available from: http://europa.eu.int/comm/environment/water/water-framework/index_en.html
- Forsyth, T. (2003). *Critical Political Ecology: The politics of environmental science*, Routledge, ISBN 0 415185637, New York.
- Funke, N., Oelofse, S.H.H., Hattingh, J., Ashton, P.J. and Turton, A.R. 2007a. *IWRM in Developing Countries: Lessons from the Mhlathuze Catchment in South Africa*. *Physics and Chemistry of the Earth*, Vol. 32, pp. 1237-1245, ISSN 1474-7065.
- Funke, N., Nortje, K., Findlater, K., Burns, M., Turton, A., Weaver, A. and Hattingh, H. 2007b. *Redressing inequality: South Africa's new water policy*. *Environment*, Vol. 49, No.3, (April, 2007), pp. (12-23).
- Funke, N. and Nienaber, S. (in press). *Promoting uptake and use of conservation science in South Africa*. Accepted in *Water SA*.
- Funke, N., Nienaber, S. and Gioia, C. (in press). *Interest groups at work: environmental activism and the case of Acid Mine Drainage on Johannesburg's West Rand*. To be published in a *Handbook on Activism by the University of Pretoria*.
- Global Water Partnership, Technical Advisory Committee (GWP-TAC) (2000). *GWP-TAC. 2000. 'Integrated Water Resources Management', Background paper No 4*. Global Water Partnership – Technical Advisory Committee, 71 p, Global Water Partnership, ISBN: 91-630-9229-8, Stockholm, Sweden.
- Gooch, G.D. and P. Stålnacke. (Eds.) (2006). *Integrated Transboundary Water Management in Theory and Practice: Experiences from the New EU Eastern borders*. IWA Publishing, ISBN: 9781843390848, London.
- Greenberg, S. (2010). *Status Report on Land and Agricultural Policy in South Africa, 2010*. Research Report 38, Programme for Land and Agrarian Studies, University of the Western Cape, ISBN 978-1-86808-703-7, Cape Town, South Africa.
- Groenewald, J.A. (2004). *Conditions for Successful Land Reform in Africa*. *South African Journal of Economic Management Science*, Vol. 7, No. 4., Juta & Co. ISSN 1015-8812

- Hall, R. (2004). Land and agrarian reform in South Africa: A status report 2004. Research Report No. 20, Programme for Land and Agrarian Studies (PLAAS), University of the Western Cape, ISBN: 1-86808-600-3, Cape Town.
- Hall, R. (2009). Land reform in South Africa: Successes, challenges and concrete proposals for the way forward. Proceedings of the Workshop on 'Land Reform in South Africa: Constructive Aims and Positive Outcomes - Reflecting on Experiences on the Way to 2014'. ISBN: 978-0-9814032-6-7, Roode Vallei Country Lodge, Pretoria, 26-27 August 2008.
- Hattingh, J., Maree, G., Oelofse, S., Turton, A. and van Wyk, E. (2004). Environmental governance and equity in a democratic South Africa, paper presented at the AWRA/IWLRI International Conference on Water Law Governance in Dundee, Scotland.
- Hobbs, P. (2010). Water and sustainable mining. In: A CSIR perspective on water - 2010. CSIR Report No. CSIR/NRE/PW/IR//2011/0012/A, ISBN 978-0-7988-5595-2, Pretoria, CSIR.
- Hobbs, P. and Kennedy, K. (2010). Acid mine drainage: addressing the problem in South Africa. Report No.: CSIR/NRE/WR/IR/2011/0029/A. Pretoria, CSIR.
- HSRC (Human Sciences Research Council) (2003) Land redistribution for agricultural development: Case studies in three provinces. Unpublished report. Integrated Rural and Regional Development Division, HSRC, Pretoria.
- Jacobs, P. (2003). Support for agricultural development, *Evaluating land and agrarian reform in South Africa: An occasional paper series*. Hall, R (Ed), Institute of Poverty, Land and Agrarian Studies, University of the Western Cape, ISBN: 1-86808-588-0, Cape Town.
- Jacobs, I.M. 2010. Norms and transboundary co-operation in Africa: the cases of the Orange-Senqu and Nile Rivers. PhD Dissertation: University of St. Andrews.
- Jonch-Clausen, T., 2004. *Integrated Water Resources Management (IWRM) and Water Efficiency Plans by 2005 Why, What and How?* Global Water Partnership, ISBN 91-974559-5-4, Stockholm, Sweden.
- Joubert, R. and Kruger, G. (2005). Land reform and redistribution implementation in the Mpumalanga Province sugar industry, South Africa: A process approach. RICS Research Paper Series, Vol. 5, No. 10, Royal Institute of Chartered Surveyors, London.
- Kleinbooi, K. (2009). Resources and rights: water and land in rural development. PLAAS Umhlaba Wethu 9, November 2009.
- Lahiff, E. (2007). "Willing buyer, willing seller": South Africa's failed experiment in market led agrarian reform. *Third World Quarterly*, Vol. 28 No. 8, pp. (1577-98), ISSN 0143-6597.
- Lahiff, E. (2008). Land reform in South Africa: A status report 2008. Research Report 38, Programme for Land and Agrarian Studies (PLAAS), University of the Western Cape, ISBN 9781868086849, Cape Town.
- Lyne, M. and Darroch, M. (2003). Land redistribution in South Africa: Past performance and future policy. In: *The challenge of change: Agriculture, land and the South African economy*, Nieuwoudt, L. and Groeneveld, J. (Eds.), pp. (65-86), University of Natal Press, ISBN 186914032X, Pietermaritzburg.

- Maherry, A. (2010). Map of South Africa's annual rainfall. In :A CSIR perspective on water – 2010. CSIR Report No. CSIR/NRE/PW/IR//2011/0012/A, ISBN 978-0-7988-5595-2, Pretoria, CSIR.
- Manona, S. (2009). Key policy challenges for rural development: land, water and traditional leaders. PLAAS Umhlaba Wethu 9, November 2009.
- Mostert, E. (1998). River Basin Management in the European Union; How It Is Done and How It Should Be Done. *European Water Management*, Vol. 1, No. 3, (1998), pp. (2635), ISSN 1994-8549.
- Nel, J. (2010). Sustainable water ecosystems. In: A CSIR perspective on water – 2010. CSIR Report No. CSIR/NRE/PW/IR//2011/0012/A, ISBN 978-0-7988-5595-2, Pretoria, CSIR.
- PLAAS. (2009). Umhlaba Wethu 9: A bulletin tracking land reform in South Africa. November 2009, Institute for Poverty, Land and Agrarian Studies, Date of access 20 July 2011, Available from:
http://www.plaas.org.za/pubs/ne/uw/Umhlaba_Wethu_9.pdf/
- Pollard, S. and Du Toit, D. 2005. Achieving Integrated Water Resources Management: the mismatches in boundaries between water resources management and water supply, paper presented at the International Workshop on African Water Laws: Plural Legislative Frameworks for Rural Water Management in Africa in Johannesburg, South Africa, 2005.
- Postel, S. and Richter, B. (2003). *Rivers for Life: Managing Water for People and Nature*. Island Press, ISBN 1-55963-444-8, Washington D.C.
- Pressley, D. (2010). Farming reform a failure for 9 out of 10. Business Report. Pretoria News, Wednesday, March 3, 2010.
- Republic of South Africa (1998). National Water Act (Act No. 36 of 1998), Government of the Republic of South Africa, Pretoria.
- Sayer J.A and Campbell, B. (2004). *The Science of Sustainable Development: Local Livelihoods and the Global Environment*. Cambridge University Press, ISBN 0-521-82728-0, Cambridge.
- Schreiner, B., van Koppen, B. and Khumbane, T. 2002. From bucket to basin: a new paradigm for water management, poverty eradication and gender equity. In: *Hydropolitics in the developing world: a Southern African perspective*, A.R. Turton and R. Henwood, pp. (127-140), African Water Issues Research Unit, ISBN 0-620-29519-8, Pretoria.
- Surplus People Project (2007). Input on poverty alleviation: Emerging farmers and forestry and water licensing to previously disadvantaged individuals. SPP, Pretoria.
- Strydom, W. (2010). Map of water use per sector. In: A CSIR perspective on water – 2010. CSIR Report No. CSIR/NRE/PW/IR//2011/0012/A, ISBN 978-0-7988-5595-2, Pretoria, CSIR.
- Thomas, R. J. (2002) Revisiting the Conceptual Framework : Project Sites and Results of Assessment Methodology 97 for INRM Developed in Penang and Cali. *Proceedings of Putting INRM into Action*. F. Turkelboom, R. LaRovere, J. Hageman, R. El-Khartib and K. Jazeh (eds.), 4th INRM Workshop held at ICARDA, Aleppo, Syria, 16-19 September, 2002.
- Turner, S. and Ibsen. I. (2000). Land and agrarian reform in South Africa: a status report. Research Report No. 6. Cape Town: Institute of Poverty, Land and Agrarian Studies, University of the Western Cape.

- Van Koppen, B. (2009). Widening gaps in water reform. PLAAS Umhlaba Wethu 9, November 2009.
- Van Koppen, B., Sally, H., Aliber, M., Cousins, B. and Tapela, B. (2009). Water resources management, rural redress and agrarian reform. Development Planning Division Working Paper Series No.7, DBSA, Midrand.
- Vink, N. and Van Rooyen, J. (2009). The Economic Performance of Agriculture in South Africa since 1994: Implications for Food Security. Development Planning Division Working Paper Series No.17, DBSA, Midrand.
- Walker, C. (2005). The limits to land reform: Rethinking 'the land question'. *Journal of Southern African Studies*, Vol. 31, No. 4, (December 2005), pp. (805-824), ISSN 0305-7070.
- Water Research Commission (1996). Policy proposal for irrigated agriculture in South Africa. Discussion document prepared by Backeberg, G.R., Bembridge, T.J., Bennie, A.T.P., Groenewald, J.A., Hammes, P.S., Pullen, R.A. and Thompson, H. Report No. KV96/96, Pretoria.
- Woodhouse, P. (2008). Water Rights in South Africa: Insights from Legislative Reform. BWPI Working Paper 36, Brooks World Poverty Institute, ISBN 978-1-906518-35-6, Manchester.
- Department of Agriculture, Forestry and Fisheries (DAFF). 2011a. Personal communication with government official. 7 February 2011, Pretoria, South Africa.
- Department of Agriculture, Forestry and Fisheries (DAFF). 2011b. Personal communication with government official. 22 February 2011, Pretoria, South Africa.
- Department of Rural Development and Land Reform (DRDLR). 2011a. Personal communication with government official. 21 February 2011. Pretoria, South Africa.
- Department of Rural Development and Land Reform (DRDLR). 2011b. Personal communication with government official. 27 January 2011. Pretoria, South Africa.

IntechOpen



Current Issues of Water Management

Edited by Dr. Uli Uhlig

ISBN 978-953-307-413-9

Hard cover, 340 pages

Publisher InTech

Published online 02, December, 2011

Published in print edition December, 2011

There is an estimated 1.4 billion km³ of water in the world but only approximately three percent (39 million km³) of it is available as fresh water. Moreover, most of this fresh water is found as ice in the arctic regions, deep groundwater or atmospheric water. Since water is the source of life and essential for all life on the planet, the use of this resource is a highly important issue. "Water management" is the general term used to describe all the activities that manage the optimum use of the world's water resources. However, only a few percent of the fresh water available can be subjected to water management. It is still an enormous amount, but what's unique about water is that unlike other resources, it is irreplaceable. This book provides a general overview of various topics within water management from all over the world. The topics range from politics, current models for water resource management of rivers and reservoirs to issues related to agriculture. Water quality problems, the development of water demand and water pricing are also addressed. The collection of contributions from outstanding scientists and experts provides detailed information about different topics and gives a general overview of the current issues in water management. The book covers a wide range of current issues, reflecting on current problems and demonstrating the complexity of water management.

How to reference

In order to correctly reference this scholarly work, feel free to copy and paste the following:

Nikki Funke and Inga Jacobs (2011). Integration Challenges of Water and Land Reform – A Critical Review of South Africa, Current Issues of Water Management, Dr. Uli Uhlig (Ed.), ISBN: 978-953-307-413-9, InTech, Available from: <http://www.intechopen.com/books/current-issues-of-water-management/integration-challenges-of-water-and-land-reform-a-critical-review-of-south-africa>

INTECH
open science | open minds

InTech Europe

University Campus STeP Ri
Slavka Krautzeka 83/A
51000 Rijeka, Croatia
Phone: +385 (51) 770 447
Fax: +385 (51) 686 166
www.intechopen.com

InTech China

Unit 405, Office Block, Hotel Equatorial Shanghai
No.65, Yan An Road (West), Shanghai, 200040, China
中国上海市延安西路65号上海国际贵都大饭店办公楼405单元
Phone: +86-21-62489820
Fax: +86-21-62489821

© 2011 The Author(s). Licensee IntechOpen. This is an open access article distributed under the terms of the [Creative Commons Attribution 3.0 License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

IntechOpen

IntechOpen