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Bridging the economic divide in South African agriculture by improving access to natural resources

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1. Introduction

The paper focuses on improvement in access to the natural resources land and water to bridge the economic divide in South African agriculture. The relevance of the approach to bridging the economic divide, progress made since 1994 in land and water reform and problems experienced and strategies to overcome them are discussed. Challenges imposed by climate change and biodiversity on the effective utilization of land and water resources are also highlighted. Given the broadness of the subject, an overview of some important issues can only be attempted within the allocated time.

The presentation starts with background information to place the discussion in context within the national framework and to define certain concepts. Conceptual issues regarding access to natural resources are then presented to serve as an analytical framework for the subsequent discussions on access to land and water, climate change and biodiversity. The presentation concludes by integrating the foregoing discussions and highlighting some challenges for agricultural economists.

2. Background

More than 10 years after the first democratic elections in South Africa, the economic divide in South Africa is still too wide and progress in shrinking the divide is very slow (IRIN News.org, 1 September 2005). This situation prevails despite a concerted effort by government and other role players to narrow the divide (May *et al*, 1998). From the many reasons that can be cited, May *et al*

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(1998:27) relates two to be main causes, namely underlying distortions in economic markets and social institutions introduced by apartheid.

The economic divide refers to the poverty and inequality gap that exists between two economies in South Africa. The first is prosperous, skilled and largely white, while the second is poor, unskilled and largely black (Landman *et al*, 2003).

Although poverty and inequality are frequently used as if they refer to the same phenomena/problem, they are totally different (May *et al*, 1998). Where poverty is characterized by the inability of individuals, households or communities to command sufficient resources to satisfy a socially acceptable minimum standard of living, inequality refers to a state of social organisation where access to resources and opportunities are unequal.

A criterion generally used to measure poverty is the number of people living below the minimum living level. Applying this criterion showed that the poverty situation in South Africa has improved somewhat between 1970 and 2000. According to Landman *et al* (2003) the proportion of people living in poverty was reduced from 50% to 38%, although the number of people living in poverty has increased by 6 million (from 11 million in 1970 to 17 million in 2000). The income inequality (skewed income) situation as reflected in the Gini coefficient has however deteriorated to 0,6 in 2000. The main driver of inequality in South Africa is no longer the Black/White divide, but rather the intra group divide between rich Blacks and poor Blacks. Between 1970 and 2000 it moved up from 0,49 to 0,59 amongst Black households, and from 0,43 to 0,49 amongst White households.

Because of the differences between poverty and inequality, finding of effective policy measures to address both simultaneously might be a problem (Landman *et al*, 2003). For instance promoting the economic growth rate was effective in the past in reducing poverty but not in reducing inequality. A huge challenge is to strike the optimum balance between growth (poverty reduction) and redistribution (equality promotion) policies while honouring political, social, environmental and economic sustainability.

Reducing poverty and inequality to only one indicator for each is oversimplifying the problem. The perceptions of persons experiencing poverty and inequality should be utilized to form a better perception of what it is all about. May *et al* (1998:5) stated, "Poverty is perceived by poor South Africans themselves to include alienation from the community, food insecurity, crowded homes, usage of unsafe and inefficient forms of energy, lack of jobs that are adequately paid and/or secure, and fragmentation of the family." Regarding inequality policy aims to reduce it should include "increasing the relative income share of the least well-off, lowering the income 'ceiling' (the income earned by the most well-off), facilitating upward mobility, promoting economic inclusion, avoiding perpetuation of the advantages conferred by wealth, and achieving more favourable comparisons against international yardsticks".

Because poverty and inequality are both reflected in various parameters or indicators, analysing progress in bridging the economic divide requires comprehensive social indicator data and application of composite indices like the Human Development Index (HDI) to measure progress over time (May *et al*, 1998:4). Also important is that multi-dimensional thinking is needed and a multi-dimensional approach (Landman *et al*, 2003, call it a common approach) to progress be implemented. A multi dimensional approach with comprehensive integrated policies and strategies is essential to successfully address the different dimensions of the economic divide problem (May *et al*, 1998). An important component of this approach is to improve access of the poor to natural resources.

3. Improving access to natural resources: conceptual issues

Improving access to natural resources is considered fundamental to poverty reduction especially for the rural poor (Bauman, 2002; May *et al*, 1998). But on its own it is however not sufficient to reduce poverty. Access to other resources and services are also needed as well as improvement of the ability of people to combine the natural resources (land, water, climate and biodiversity) with other resources (capital, labour and management) in efficient and sustainable farming systems (National Department of Agriculture (NDA), 2004).

Changes in policies, acts and institutions as well as development of effective strategies and programs are needed to improve access to resources and to empower people to the successful management of resources. Fundamental to development of efficient policies, acts and strategies to cater for the needs of the rural people understands the linkages between poverty, livelihoods, vulnerability and access to resources. The sustainable livelihood approach (SLA) emerged in the last decade of the previous century as a practical and effective approach to understanding the linkages and to identify suitable and acceptable development interventions (Bauman, 2002:3).

The SLA, which is a development objective, an approach to poverty reduction as well as an analytical framework, is based on the following principles such as: people-centered, holistic, responsive and participatory, multi-level, conducted in partnership, sustainable and dynamic. It is not a new paradigm but a collection of best practiced principles and theories incorporating lessons from other approaches in a framework that combines analysis and practice (Bauman, 2002; FARA, 2005).

Although the ideas of the SLA are not new the approach has come of age in a receptive policy environment. The relevance of the SLA will however continuously be challenged by how well it manages to achieve its objectives of understanding and then assisting to transform the livelihoods of rural people.

The subsequent discussion of the natural resources will draw on the conceptual issues mentioned above.

4. Access to land

An outstanding feature of the South African natural resource landscape at the start of new democracy in 1994 was race-based inequality with regard to land ownership and land tenure. Prior to the 1994 elections the ANC had already stated that the Reconstruction and Development Programme (RDP) was to redress the injustice of forced removals and historical denials of access to land for black people which were legacies of various previous governments since about 1913 (Sibanda, 2001). The 1997 White paper on Land Policy (RSA, 1997) stated that the central thrust of the land policy is the land reform programme, which has three aspects, namely, land restitution, land redistribution and tenure reform. The White Paper also stated that "the success of these elements of the programme is dependent in the long run on more than merely access to land. Provision of support services, infrastructural and other development programmes, is essential to improve the quality of life and the employment opportunities resulting from land reform."

According to Sibanda (2001:2–3) the Land Restitution Programme deals with claims lodged in terms of the *Restitution of Land Rights Act, 22 of 1994,* under which a person or community dispossessed of property after 19 June 1913 (the date of the Natives Land Act), as a result of racially discriminatory laws or practices, is entitled to lodge a claim for restitution of that property of comparable redress. The Land Redistribution Programme's objective is to provide the disadvantaged and the poor with land for residential and productive purposes, while the Land Tenure Reform Programme aims to provide people with secure tenure where they live, to prevent arbitrary evictions and fulfil the constitutional requirement that all South Africans have access to land legally secure tenure in land.

To achieve the envisaged successes with these programs a steep learning curve was embarked on. Much effort was initially spent by the Department of Land Affairs in mobilizing communities to access government settlement/land acquisition grants (SLAGs) to acquire land. Due to problems (farms too small to support beneficiaries as full-time farmers and slow pace of land reform (May *et al*, 1998:14) a new approach to land reform (LRAD) was implemented from 2001.

The LRAD (Land Redistribution for Agricultural Development) programme provided for and extended scale of grants and made it possible for aspiring commercial farmers who were excluded under the SLAG programme to access LRAD grants. Success of the new programme depends on efficiency of LRAD implementation (Lyne and Darroch, 2003) and farmers' access to support services (Vink and Kirsten, 2003).

Evaluation of the progress with the land reform program over time indicates that as experience was gained and identified constraints addressed the delivery speed of the program increases. Despite this achievement, dissatisfaction with the speed of progress was experienced within a wide group of the community as was voiced at the Land Summit on 31 July 2005 (South Africa.info, 2005). According to (IRIN News.org, 1 September 2005) Glen Thomas director general of Department of Land Affairs stated that "when the democratic government took over in 1994, 87 percent of agriculture land was owned by whites. Although about 1,2 million people benefited from the land reform programme, about 80% of the agricultural land are still owned by whites. Of the 7,900 land claims submitted, the government had settled 62,127, with about 3,1 million hectares of land being redistributed."

The target set by government at the Land Summit of 31 July 2005 (South Africa.info) is that all land restitution claims be settled within the next three years and that 30% of agricultural land to be delivered to the previously disadvantaged by 2014.

5. Access to water

As with land, the water rights situation in 1994 reflected a very skewed distribution between the white and black populations of South Africa (Turton, 2005). In order to redress the situation that developed during the apartheid era a wide-ranging consultation process was set in motion in accordance with the new constitution. The water law principles were first developed and published in 1996, and based there on the New Water Policy in 1997 (1997 White Paper on a National Water Policy) (DWAF, 1997; Backeberg, 2005). The

broad objectives of the new water policy are to achieve equitable access to water, sustainable and efficient use of water for optimum social and economic benefit. As a legal framework for the policy the water services act (WSA) (Act 108 of 1997) was promulgated in 1997 with main aim to provide for the right of access to basic water supply and basic sanitation followed in 1998 by promulgation of the national water act (NWA) (Act 36 of 1998) (RSA, 1998a). The national water resource strategy provides the implementation framework for both the WSA and the NWA (DWAF, 2002).

Progress between 1994 and March 2004 to redress backlogs in service provision with regard to basic water supply and basic sanitation infrastructure, in accordance with the 1997 WSA, was quite impressive. The percentage of the total population with access to water supply infrastructure services increased from 60% to 91%, while those with access to basic sanitation infrastructure services increased from 49% to 64% (2004 Annual Report, DWAF).

However, progress with regard to redress of water provision to irrigation farmers in accordance with the NWA went much slower. Reasons include water for irrigation reform purposes being linked to land reform, and settlement of new irrigation farmers as well as implementing certain complexities of the NWA being time-consuming.

With regard to the NWA Turton (2005) indicates that it is a revolutionary document in many respects and mentioned *inter alia* the following as major elements of the act: Water rights previously associated with land rights have been repealed. The only water protected by legal rights is the water needed for basic human consumption (called the Basic Human Needs Reserve); and the water needed to sustain ecosystem integrity (called the Environmental Reserve). Water will be managed at the lowest practical level in society, in keeping with the internationally accepted principle of subsidiary. While the letter of the act is about redistribution and historic redress, the spirit of the act is encapsulated in five eloquent words, "some, for all, forever, together".

Amongst the "three highly complex sets of processes" that are called for in the NWA, namely: the formation of catchment management agencies, water allocation reform (WAR) and classification of all rivers in the country, the water allocation reform (WAR) program is the most public of these issues at present and also politically sensitive. Because water gives value to land, it means the fact that water rights previously linked to land rights have been abolished makes the WAR program indirectly also a land reform program (Turton, 2005).

In applying the WAR program, a delicate balancing act is to be performed that will keep the process of redress and redistribution firmly on track, while not undermining investor confidence or social stability.

In the 2005 draft position paper for Water Allocation Reform (WAR) (DWAF, 2005), two guidelines that are particularly relevant for this discussion are mentioned. The water allocations process must be supported by capacity development programmes that support the use of water to improve livelihoods and to support the productive and responsible use of water by all users. The water allocations process will contribute to broad-based black economic empowerment (BBBEE) and gender equity by facilitating access by black and women owned enterprises to water.

6. Climate change

Research conducted in South Africa (and elsewhere by various research groups) confirmed that significant climate changes are taking place all over the globe and that there seems to be an acceleration in climate change as time goes on (World Meteorological Organization (WMO, 2001); South African Weather Service (Volksblad, 2005); South African Biodiversity Institute (De Waal, 2005); Water Research Commission (Schulze (ed), 2005)).

According to Johnson (Genis, 2005) global warming is no foreign event (Mendelsohn and Dinar, 2003) as the earth has for instance sequentially heated and cooled 20 times the passed half million years, with sea levels rising and dropping as glaziers decreased or increased in size. What is however different this time is that the climate change has a large component of human interference. Rising in temperatures seem to reflect increases in greenhouse gasses as a result of human activity. Heat waves are more general in summers and the winters are not so cold. Winter rainfall areas are decreasing and winter rain tends to fall on single days. Thereby is the sea level 10 cm higher than in 1900. Flooding and droughts will become more frequent and with higher intensities (Turpie *et al*, 2004).

It is especially relevant to take note of the impact these environmental changes are having on the agricultural sector in general and the farming community in particular. With regard to effects on agriculture, Johnson mentioned: changes in optimal times to grow crops, changes in land types and their suitability for different crops, crop yield losses due to increased rainfall variability, increase in insect pests and plant illnesses and a greater demand for irrigation water (Genis, 2005).

Huntley confirms that the agricultural sector will be the sector mostly affected by climate change. The commercial sector should adopt new ways of thinking to survive the process and more research is crucial to develop new farming systems, new cultivars and new cultivation methods. Small and emerging farmers will be the group that will likely suffer more as a result of climate change (De Waal, 2005a). Thus climate change May detract from current efforts at bridging the divide (Kundhlande, 2005; Jooste, 2005).

In the Midlands of KwaZulu-Natal a sustainable livelihoods framework (SLF) to identify the possible impact of climate variability on the vulnerabilities of a small-scale community of irrigation farmers and a group of large scale commercial farmers was applied (Reid, Marsey and Vogel, in Schulze (ed), 2005). In the case of the small-scale farmers (for instance), the following multiple stressors that enhance vulnerability and constrain adaptive capacity were identified: lack of institutional organisation, lack of access to information and broader governance issues associated with relevant authorities. Although climate change and variability are high on the list of stresses that farmers face, both small- and large-scale farmers have identified many external and internal, social, economic, political and environmental issues that expose their vulnerability to periods of climate stress.

Farmers have adopted many strategies to cope with and adapt to these multiple stresses. Due to "complex" local dynamics, one size will not fit all when designing future institutional and local response interventions. Sitespecific applied research within a SLA is needed to unravel the important linkages and to design effective intervention measures. Schulze (ed) (2005) conclude that strategies will need to take congnisance of specific local situational contexts, on the one hand, and national level policy and institutional issues, on the other. The latter are ideally implemented through effective integrated water resources management.

7. Biodiversity

From a natural resource and environmental economic perspective a guiding criterion is to use land and water resources dynamically efficient within an environmental sustainable context. The latter points to the necessity to preserve biodiversity. A big concern in South Africa as elsewhere in the world is the ongoing destruction of biodiversity through human activities. The world-wide concern about biodiversity is *inter alia* reflected in a resolution of the 2002 Johannesburg World Summit on Sustainable Development to stop losses in biodiversity within 10 years. For South Africa Huntley indicated that climate change is having a tremendous impact on biodiversity. Many plant

species for instance of the Southern Cape Fynbos can become extinct (De Waal, 2005b; Genis, 2004; Turpie *et al*, 2004).

The concern and involvement of the new democratic government on this issue are *inter alia* reflected in the aims and context of the following policy documents: 1997 White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity, (Department of Environmental Affairs and Tourism, 1997), the National Environmental Management Act (Act 107 of 1998) and the 2003 Natural environmental Management: Biodiversity Bill (RSA, 1998b; 2003).

Because land/soil and water are fundamental components of the natural system that creates, supports and sustain life on earth (being the living habitats for most biodiversity on earth) improving access to land and water also means obtaining access over and accept responsibility for biodiversity. Ample evidence is available proving that not being able to manage biodiversity sustainably (for instance by deforestation practices) creates a situation where poverty and deforestation are reinforcing each other in destructive downward spiralling vicious circle (Tietenberg, 2003).

The way the owner/user of natural resources manages them has a direct (and indirect) impact on preserving or destroying biodiversity. Conventional farming methods applied by commercial farmers, with the focus on high per ha yields (i.e. mono crop maize, using tractors, ploughs, artificial fertilizers and pesticides), have a negative impact on the biodiversity living in the soil and also on the water resource (through *inter alia* pollution externalities). Biological farming on the other hand is farming in harmony with nature and will maintain and improve biodiversity in the soil. (Standard Bank AgriReview, 2005).

It is expected that as pressures to conserve biodiversity is mounting, farmers will increasingly be forced to apply farming methods which is in harmony with nature. This may in the short and medium term put and additional burden on many farmers who already struggle to survive financially but should in the long-term not only contribute to environmental sustainability but also to sustainable economic efficiency.

8. Concluding remarks

To address the economic divide that exists between the two economies in South Africa the new democratic elected government embarked on an unprecedented path of policy and law reform. This was sanctioned by the New Constitution (Act 108 of 1996) (RSA, 1996) which forms the new supreme law of South Africa. The Constitution "requires" that all laws of the country should be scrutinized and changed, where necessary, to serve the needs of the new broader constituency according to the principles contained in the Bill of Rights.

Remarkable achievements have been reached over a wide spectrum and there is general consensus that the policies developed and laws promulgated are for the most part very good. Based on these policies various strategies and programmes have been and are developed and implemented on a challenging and steep learning curve. Inefficiencies in strategies and bottlenecks in implementation of programmes are some of the main causes for a slow delivery rate of expected outcomes.

Improving access to natural resources for people belonging to the second economy is acknowledge as fundamental to bridging the poverty and inequalities divide. Although some progress can be reported with regard to improved access to both land and water, the process in happening too slowly. Main reasons are that the process is complex and for evolutionary redress time-consuming with regard to strategy changes, acceptance by the broader community, finances required, administrative capacity, skills needed and legal procedures involved.

Improved access to natural resources is not sufficient on its own to substantially and effectively bridge the economic divide with regard to poverty and inequality reduction. For real effect it must be part and parcel of a comprehensive multidimensional approach and strategy. People getting more access to natural resources should be empowered to combine the natural resources (land, water, climate, biodiversity) with other resources (capital, labour and management). This is to be achieved in socially acceptable, institutionally implementable, economically viable and environmentally sustainable livelihood systems.

Government response to the latter requirements is *inter alia* reflected in policy developments in agriculture that started parallel to policy and strategy development within land and water reforms as illustrated in the 1995 White Paper on Agriculture, the 1998 Discussion Document on Agricultural Policy and the 2001 Agricultural Strategic Plan (National Department of Agriculture, 1998; 2001). Recent acceleration of the agricultural reform process is reflected in the 2004 Document "Agribee Broad Based Black Economic Empowerment Framework for Agriculture" (National Department of Africulture, 2004). This BBBEE framework is built on experiences gained from predecessors

"Broadening Access to Agriculture (BATAT)" and the more resent agriculture sector strategy.

AGRIBEE, applicable on all economic activities in the total value chain, is a sectorial broad-based black economic empowerment framework. Aimed to deliberately and systematically support black South Africans to enable them to participate fully and actively in the agricultural sector as owners, managers trained employers and consumers. Although controversial, by including land reform targets as part of BBBEE, this new initiative by government provides new impetus to the process of land and water allocation reform and thus to improvement of access to and the more efficient and sustainable utilization of natural resources.

Settlement of new farmers to run successful farming livelihood systems is a major challenge, especially if the aim is to develop commercial farmers (Bernstein, 2005; Mbongwa and Thomas, 2005). An SLA is *inter alia* needed to discover linkages between poverty, vulnerability and access to natural resources and to design suitable empowerment intervention strategies. Another challenge is that the expertise base needed to be successful in farming is becoming more complex as indicated by the level of farm management skills needed to better manage climatic risks and biodiversity than in the past.

9. Challenges for agricultural economists

Agricultural economists are involved in many activities relevant to improve access to natural resources by the disadvantaged communities, from policy development, through strategy, program and plan design, research, training and skills development, on to farm advice delivery and implementation. A big challenge is to advice on combining resources in sustainable and efficient farm livelihood production systems

The better we empower ourselves with relevant knowledge and skills to *inter alia* operate efficiently in multi-disciplinary and multi-cultural groups within a SLF, the more efficient our work will be to empower others to contribute to or to benefit from improved access to natural and other resources. This conference should at least make us aware of the complexities involved on the road to bridging the economic divide, and of the issues that are most demanding for ourselves and our discipline to stay relevant.

The relevance of our discipline and effectiveness of our actions as agricultural economists are challenged by our ability to be effective on at least the following levels: to successfully participate in research to unravel the linkages

between the various components/factors contributing to the economic divide within a sustainable livelihood approach, to assist as part of multi-disciplinary teams in policy, strategy and plan development efforts and to assist in implementation of farm plans and strategies at grass root level.

Be also aware that to align our policies, strategies and plans to be in harmony with environmental requirements is to align our life style and work to be in accordance with the stewardship command from the Bible; namely to use and manage the environmental resources on earth sustainably in a spirit of love and care for all God's creations.

References

Backeberg GR (2005). *Reform of user charges, market pricing and management of water: Problem or opportunity for irrigated agriculture?* Paper presented at the ICID 21st European Regional Conference on "Integrated Land and Water Resources Management: Towards Sustainable Rural Development", Frankfurt (Oder), Germany and Slubice, Poland, 15–19 May 2005.

Baumann P (2002). *Improving access to natural resources for the rural poor.* Food and Agriculture Organization of the United Nations. Livelihood Support Programme (LSP), Rome.

Bernstein S (ed) (2005). *Land reform in South Africa: A 21st century perspective: Challenging the dominant perspective of land reform in South Africa.* Centre for Development and Enterprise (CDE), South Africa.

Boardley S & Schluze RE (2005). *Policy in regard to potential impacts of climate change on water resources in South Africa: An overview.* In: Schulze RE (ed), Climate change and water resources in Southern Africa: Studies on scenarios, impacts, vulnerabilities and adaptation. WRC Report 1430/1/05, Chapter 26:417–421. Water Research Commission, Pretoria, RSA.

Department of Environmental Affairs and Tourism (1997). White Paper on the conservation and sustainable use of South Africa's biological diversity. Discussion document, Pretoria.

Department of Water Affairs and Forestry (DWAF) (1997). White Paper on a national water policy for South Africa. Pretoria.

Department of Water Affairs and Forestry (DWAF) (2002). *National Water Resource Strategy (NWRS).* (Proposed first edition). Pretoria.

Department of Water Affairs and Forestry (DWAF) (2004). Annual Report, Pretoria.

Department of Water Affairs and Forestry (DWAF) (2005). *Towards a framework for water allocation planning.* A draft position paper for water allocation reform in South Africa. Discussion Document, Pretoria.

De Waal J (2005a). Landbou moet nou aanpas. Landbouweekblad, 14/06/2005.

De Waal J (2005b). Klimaatverandering hou groot gevolge in vir landbou. *Landbouweekblad*, 09/08/2005.

Dlamini DJM & Schulze RE (2005). Water poverty within a context of climate change: A case study at meso-scale in the Thukela Catchment. In: Schulze RE (ed), Climate change and water resources in Southern Africa: Studies on scenarios, impacts, vulnerabilities and adaptation. WRC Report 1430/1/05, Chapter 24:387–394. Water Research Commission, Pretoria, RSA.

Genis A (2004). Help biodiversiteit beskerm. Landbouweekblad, 20/07/2004.

Genis A (2005). O aarde, dit word droër en warmer! *Landbouweekblad*, 16/02/2005.

FARA (2004). *Building sustainable livelihoods through integrated agricultural research for development.* Sub-Saharan Africa challenge programme, Programme Proposal Volume 1. Pragati Offset (Pty) Ltd, Hyderabad, India.

Hewitson B, Engelbrecht F, Tadross M & Jack C (2005). *General conclusions on development of plausible climate change scenarios for Southern Africa*. In: Schulze RE (ed), Climate change and water resources in Southern Africa. Studies on scenarios, impacts, vulnerabilities and adaptation. WRC Report 1430/1/05, Chapter 5:75–79. Water Research Commission, Pretoria, RSA.

IRIN News.org (2005). 1995–2005 ten years serving the humanitarian community. South Africa: Inequality a threat to social stability. UN offices for the coordination of Humanitarian Affairs, 1 September 2005.

Jooste A (2005). *Personal communication.* Department of Agricultural Economics, University of the Free State, Bloemfontein.

Kundhlande G (2005). *Personal communication*. Department of Agricultural Economics, University of the Free State, Bloemfontein.

Landman JP, Bhorat H, Van der Berg S & Van Aardt C (2003). Poverty and inequality in South Africa 2004–2014. Bureau of Market Research, Unisa, Pretoria.

Lyne M & Darroch M (2003). *Land redistribution in South Africa: Past performance and future policy.* In: Nieuwoudt L & Groenewald J (Eds), The challenge of change: Agriculture, land and the South African economy. Pietermaritzburg: University of Natal Press.

May J, Govender J, Budlender D, Mokate R, Rogerson C, Stavrou A & Wilkins N (1998). *Poverty and inequality in South Africa: Summary report.* Report prepared for the Office of the Executive Deputy President and the Inter-Ministerial Committee for Poverty and Inequality, Government of South Africa, Pretoria.

Mbongwa M & Thomas G (2005). Land reform for South Africa. Response to articles and interviews by Anne Bernstein emanating from Land Reform in South Africa: 21st Century Perspective, Department of Land Affairs, Pretoria.

Mendelsohn R & Dinar A (2003). Climate, water and agriculture. *Land Economics* 79(3):328–341.

National Department of Agriculture (NDA) (1998). *Agricultural policy in South Africa.* Discussion document, Pretoria.

National Department of Agriculture (NDA) (2001). *The strategic plan for South African agriculture.* Pretoria: Government Printer.

National Department of Agriculture (NDA) (2004). *AGRIBEE Broad based black economic empowerment framework for agriculture.* Government Printer, Pretoria.

Reid P, Massey R & Vogel C (2005). *Climate and development: Experiences of farmers in KwaZulu-Natal, South Africa.* In: Schulze, RE (ed), Climate change and water resouce in Southern Africa: Studies on scenarios, impacts, vulnerabilities and adaptation. WRC Report 1430/1/05, Chapter 25:395–414. Water Research Commission, Pretoria, RSA.

Republic of South Africa (RSA) (1996). *The Constitution of South Africa (Act No 108 of 1996).* Cape Town.

Republic of South Africa (RSA) (1997). South African Land Policy White Paper. Pretoria.

Republic of South Africa (RSA) (1998a). *The National Water Act (Act No 36 of 1998).* Government Gazette, Cape Town.

Republic of South Africa (RSA) (1998b). *The National Environmental Management Act (Act No 107 of 1998).* Government Gazette, Cape Town.

Republic of South Africa (RSA) (2003). *National Environmental Management: Biodiversity Bill.* Government Gazette, Cape Town.

Schulze RE (ed) (2005). *Climate change and water resource in Southern Africa: Studies on scenarios, impacts, vulnerabilities and adaptation.* WRC Report 1430/1/05. Water Research Commission, Pretoria, RSA.

Sibanda S (2001). *Land reform and poverty alleviation in South Africa.* Department of Land Affairs. Paper presented at the SARPN conference on "Land Reform and Poverty Alleviation in Southern Africa" held at the Human Sciences Research Council, Pretoria.

South Africa.info (2005). Willing buyer/willing seller's rejected. 01/08/2005.

Standard Bank (2005). *AgriReview.* Third quarter. Agricultural Information Manager, Johannesburg.

Tietenberg T (2003). *Environmental and Natural Resource Economics.* Sixth Edition. Harper Collins Publishers Inc, New York.

Turpie J, Winkler H & Midgley G (2004). *Economic impacts of climate change in South Africa: A preliminary assessment of unmitigated damage cost.* In: Blignaut J & de Wit M (Eds), Sustainable options. UCT Press, Cape Town.

Turton A (2005). *Hydropolitics and the evolution of democracy in South Africa: An Afro-optimistic view.* African Water Issues Research Unit, Centre for International Political Studies, University of Pretoria, Pretoria.

Vink N & Kirsten J (2003). *Agriculture in the national economy.* In: Nieuwoudt L & Groenewald J (Eds), The challenge of change: Agriculture, land and the South African economy. Pietermaritzburg: University of Natal Press.

Vogel C & Reid P (2005). *Vulnerability, adaptive capacity, coping and adaptation: A conceptual framework.* In: Schulze RE (ed), Climate change and water resource in Southern Africa: Studies on scenarios, impacts, vulnerabilities and adaptation. WRC Report 1430/1/05, Chapter 21:351-358. Water Research Commission, Pretoria, RSA.

Volksblad (2005). Klimaat word al hoe warmer. 27/08/2005.

World Meteorological Organization (WMO) (2001). *Climate change* 2001: *Impacts, adaptation, and vulnerability, contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC),* United Nations Environment Programme (UNEP).