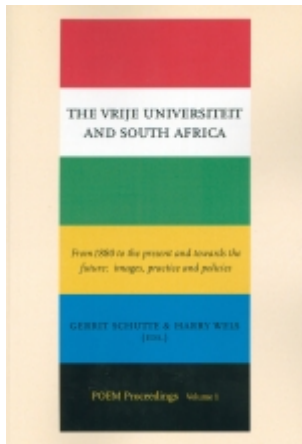


POEM: 'New' Scientific Practice In South Africa With Special Reference To Land Reform



..training new generations of scientists and technologists oriented towards the solving of real problems (White Paper on Science and Technology 1996).

The SandT capacity of the country is running as fast as it can, but is still losing ground (National Research and Development Strategy 2000).

Introduction

(2005) The landscape of scientific practice and higher education in South Africa has changed drastically since 2 February 1990. The changes that occurred in these fields during the last decade of the 20th century were probably the most incisive in the history of science and higher education in South Africa.

When the democratically elected government came into power in 1994, science was confronted with two main challenges, namely to transform the system so that the welfare of all the inhabitants could be promoted and to make South Africa competitive in a globalising world.

The new government inherited a sound science infrastructure. It was a widely dispersed and uncoordinated system in which scientists enjoyed international recognition for transplanting hearts and for enabling the deepest exploitation of mines in the world. However, the system was mainly directed at the promotion of the welfare of the white community and was strongly focussed on military defence; the provision of energy and food; and the combating of diseases.**[1]**

In this transformation process, South Africa was very receptive to theories, models and schools of thought. Expertise from abroad was not provided in all instances without direct or subtle influence. There are already indications that certain models, that were applied successfully elsewhere, cannot be transferred without adaptations to the South African situation, where complex issues have to

be addressed. The question that arises is whether the government implements the policy documents that were designed by intellectuals who are not part of the bureaucracy.

Two examples are applicable to the aims of this paper. Firstly, the work by Gibbons et al. (1994) entitled *The new production of knowledge: The dynamics of science and research in contemporary societies* and also Scott et al.'s (1995) *The meaning of mass higher education* have had a strong influence on policy formulation regarding science and regarding higher education (Kraak 2000). Secondly, the World Bank has made significant inputs to the establishment of the policy on land reform. There is at present a widespread debate on whether a shift of emphasis from Gibbons' Mode 1 (basic) to Mode 2 (interdisciplinary or applied research) has had a beneficial effect on teaching and research in higher education in particular and on science in general. Older academics and researchers find it difficult to switch from Mode 1 to Mode 2. Younger researchers and some faculties at universities have probably embraced this new paradigm and the pursuit of relevance so strongly that it now threatens to smother them. In this regard there appears to be a great deal of validity in Sheila Slaughter's statement, as quoted by Kraak (2000: 33): *... that the commercialization of the academy will lead to a decline of the canonical tradition itself, the weakening of the professorate and scholarly research and the triumph of a managerial mode of control in the university not unlike that of corporate capitalism.*

The new way of creating and disseminating knowledge is an indisputable feature across the world and a new social organisation of knowledge and learning is emerging. In South Africa it has occurred very rapidly and with strong government interference, and therefore it is inevitable that there will be some distortion. *Part I* of this paper summarises the strengths and weaknesses of science and of higher education over the past ten years. *Part II* focuses on the complexity of land reform, which is one of the most important political and socio-economic issues that faces the country en route to ensuring that its society is fair and peaceful to a greater extent than before. This issue can only be resolved by *new generation* researchers who use a combination of basic and interdisciplinary applied research.

Part I

Strengths and weaknesses of science and higher education

Throughout the struggle years, the ANC accorded a high priority to the role that

science and technology should fulfil in the reconstruction of the country. After coming to power in 1994, they maintained the science infrastructure to a large extent and approached it with circumspection. The expenditure on military research [2] and on energy independence was reduced. This reduction partly explains why the expenditure on RandD declined from 1,19 per cent of the GDP in 1990 to 0,79 per cent in 2002 (National Research and Development Strategy 2002). It is probable that more expertise could have been retained to convert 'swords into ploughshares'. Some knowledge used in the production of weapons has been applied in industry, while some of the expertise of the former Atomic Energy Corporation is currently being used in amongst other things the new Pebble Bed Modular Reactor at Koeberg in the Western Cape. The establishment of a new ministry for science and technology in 2004 underlines the importance that the government attributes to science and technology

Some building blocks in the establishment of a new framework for science and higher education

Large-scale restructuring of the science system was required to achieve the main goals of transformation, a better quality of life for all inhabitants and international competitiveness. This discussion is limited to only some of the important building blocks of the process.

The Green Paper and the White Paper on science and technology: Preparing for the 21st century (1996) provided a new framework for scientific practice. It evaluated the existing system and created structures to develop, implement and monitor the policy framework (Bawa and Mouton 2003: 300). The aim was to make South Africa more responsive to restructuring and development needs. Of particular importance was the establishment of a National System of Innovation (NSI). A National System of Innovation can be thought of as a set of functioning institutions, organisations and politics that interact constructively in the pursuit of a common set of social and economic goals or objectives.

The funding of research and postgraduate training in the human and the natural sciences, [3] which was previously managed by two institutions, was integrated upon the establishment of the National Research Foundation (Act 23 of 1998). It benefited the human sciences, because more funds became available and a system of peer evaluation now identifies top researchers and funds them as generously as in the natural sciences. The total amount of funding has been increased, especially for high-level human resources development. In 2003, '*...a total of 5442 students received bursaries, of which 3309 were awarded to black*

students. It was also the first year in which the NRF supported more than 1000 PhD students...' (Von Gruenewaldt 2004).

The National Advisory Council on Innovation (NACI) was founded and began functioning in November 1998. The institution, which in essence replaced the former Science Advisory Council, advises the Minister of Science and Technology on science and technology, innovation and competitiveness. It is an important guiding mechanism in the establishment of the NSI.

An innovation fund was established in 1998 to promote technological innovation and competitiveness. Up to 2004 the fund has spend R665 million on 106 projects (Von Gruenewaldt 2004). In order to direct the research of the science councils, government grants were pruned so that income has to be augmented by means of contract research. These councils can also apply to the Innovation Fund for funds to do directed research. Thus far the science councils have benefited more from the fund than the universities have. The greater teaching load that lecturers have as a result of a larger number of ill-prepared students is one of the reasons why the universities have been poorer competitors for the funds.

Technological innovation and competitiveness have been strongly promoted by the establishment of the Technology for Human Resources for Industry Programme (THRIP). This programme is the result of a joint initiative undertaken by industry, the Department of Trade and Industry, research and education institutions, the Innovation Fund, and the Department of Science and Technology. From 1992 to September 2004, the fund spent R1,8 billion on research and development projects (Von Gruenewaldt 2004). This is one of the success stories of the past number of years.

An important milestone in the development of the research system was the National Research and Technology Audit (NRTA), which was undertaken in 1997/98. All research councils and national institutes were evaluated. Important weaknesses and strengths were identified. Science councils are evaluated annually to determine whether stated objectives have been achieved.

The National Research and Technology Foresight Exercise (1998/2000) did planning for long-term research on the technological needs of South Africa (Bawa and Mouton 2002: 302). Thirteen focal areas were identified. To a large extent, the NRF's nine focal areas accommodate the focal areas identified by the National Research and Technology Foresight Exercise. **[4]** The establishment of Centres of Excellence (COE) rewards excellent researchers and enables them to co-operate

across disciplinary boundaries and institutions in respect of projects that are locally relevant and internationally competitive. Some examples are: biomedical TB research; excellence in strong materials; invasion biology etc.

The research system in higher education, which is an important part of the national research system, was even more unequal and uncoordinated than the science system. In many respects, the higher education system experienced a revolution since 1994. Only some relevant aspects are identified in this context.

The *Report of the National Commission on Higher Education* (1996) and the *White Paper* (1997) emphasised the importance of research and the development of high-level human resources. The restructuring of curricula, to convert courses into programmes that have clear outcomes, has had a far-reaching impact on higher education. Many of the consequences of this process will only be felt after a number of years. The experience in many countries has revealed that the transformation of higher education always has some unexpected consequences. A number of universities went overboard by instituting programmes that are mainly directed at occupational training and the needs of the market. It was particularly the universities at which student numbers were increasing slowly and which were experiencing financial crises that saw these courses as a means to attract more students. For example, technikons began to offer MBA programmes without having the required human resources, experience and infrastructure. A recent evaluation of the programmes did not accord full accreditation to a number of these programmes.

In my opinion, it was especially the human sciences that considered this programme approach to be an opportunity to stop and reverse the decline in student numbers. The decline in student numbers had a particularly severe effect on the black universities and Cloete (2003: 422) justifiably remarks that '*for historically black universities the new South Africa was a disaster*'. In the fields of the human sciences and education, the universities and technikons produce more than 50 per cent of all graduates. Just above one-quarter of all graduates qualify in the fields of the natural sciences and engineering.

The conversion of courses to programmes caused a large number of departments to close, while other departments were consolidated and new faculties were established. In many cases, imaginative new programmes were instituted, but it is clear that the traditional formative courses have lost ground. The pursuit of relevance eroded the traditional disciplinary boundaries. Outcome became more

important than content. The energy that was put into these exercises, together with an increased teaching load, caused many academics to become disheartened and it has had negative consequences for teaching and especially for research. It is also doubtful whether students are better prepared for the workplace. The number of unemployed graduates, especially blacks, continues to increase.

The student numbers at universities and technikons increased at a relatively fast pace. The percentage of black students at universities increased from 32 per cent in 1990 to 60 per cent in 2000. In the same period, the increase at technikons was from 32 per cent to 72 per cent. However, the number of white students at Universities declined (Cloete 2003: 415). The high growth projections of the National Commission for Higher Education did not materialise. At the historically disadvantaged institutions in particular there were relatively small increases and even decreases in the student numbers. This phenomenon, together with maladministration at a number of institutions, led to financial crises.

Graduation trends were not reflected in the rapid increase in the number of students. [5] Therefore the Treasury was no longer prepared to fund ineffectiveness. Mass higher education (that is, the model of mass higher education as advocated by Scott) did not materialise. The consequence was that it was announced in 2004 that student numbers would be restricted. Preliminary indications are that students at several of the larger universities will be restricted and that a quota system will be introduced. Some experts are of the opinion that the universities have been deprived of their autonomy. Programmes dictate what may be taught and now quotas are being introduced that dictate who may be taught. [6]

The merger of the 21 universities and 15 technikons into 22 institutions of higher education is a far-reaching intervention. In 2000, the Minister of Education requested the Council on Higher Education to make concrete proposals on the size and shape of the higher education system. When he received the report, the Minister indicated that the government would respond to it with a national plan. The National Plan for Higher Education was released in 2001.

Although there is general consensus that there are too many universities and technikons and that a number of the institutions can probably not continue to exist independently, there are serious debates on the way in which institutions are being compelled to merge. There are large inequalities between the various universities as well as between the technikons. Many of the historically

disadvantaged universities are no more than teaching institutions that have almost no research output or research culture. In this regard, two universities, namely the University of the Western Cape and the University of Durban-Westville are exceptions as they have made great strides in respect of their research output.

The merging of universities and technikons will require much energy and an enormous amount of money. Only R3,2 billion has been set aside for the purpose, but a large portion of these funds will be used to cover the current debt of the institutions. It is quite clear that the cost has been underestimated. It is nevertheless heartening that many academic leaders, who initially raised objections to the process of merging, are now dedicated in their endeavours to make a success of the mergers.

A further drastic step was taken when technikons were granted the status of being a technological university. The important place and role that the technikons fulfil cannot be denied. However, several of these institutions still have a long way to go in terms of performance and the pursuit of excellence before they are worthy of the status of a technical university. Being appointed to a chair has traditionally been associated with postgraduate qualifications, experience in the training of students up to the doctoral level and specialised research that is published in recognised science journals. A great deal of erosion has taken place in the application of these criteria.

Right-minded South Africans agree that it was necessary to restructure higher education for the purposes of fairness and accessibility, and to direct it to a greater extent at the need for high-level human resources. The tempo at which the restructuring is occurring, could be debated, and there are real dangers that incalculable harm is being done. The fact that the goalposts are often shifted has a demoralising effect on the staff concerned. The new Minister of Education has a record of success and pragmatism and is prepared to consult widely.

The *National Research and Development Strategy*, which was published in 2002, provides, in some respects, a new direction for the implementation of the science policy. It sets out a strategy in terms of which science and technology should achieve the objectives of increasing the quality of life of all inhabitants and of increasing the country's competitiveness with the rest of the world. The strategy presupposes amongst other things '*...doubling government investment in Science and Technology over the next three years...*' (p. 17).

Have the stated objectives been achieved?

The policy documents that have been produced to establish a framework for science and technology have generally been acclaimed in the national and international arenas. In answering the question whether the stated objectives have been achieved, two provisions should be applied. Firstly, it is probably too soon to evaluate the results critically. Secondly, the statistical basis available for an analysis has serious shortcomings.

There can be no doubt that a new science landscape is developing, both nationally and within institutions (Bawa and Mouton 2002: 323). However, at this stage, some of the contours are still too faint or too vague.

Although a great deal has been achieved, many of the objectives have not been achieved. When the effectiveness of higher education is assessed in terms of the number of graduates and research outputs, it appears that it has not increased. The *National Research and Development Strategy* (2002: 73) states that '*the system is working hard ... but is going backwards*'. And furthermore, '*... the total capacity of the system is about one-third to one-half the size that it should be to form the basis of a competitive knowledge-based economy for South Africa in the medium and long term*'. There is serious concern that basic research and teaching, which are preconditions for interdisciplinary teaching and research, are being weakened by policy and market forces.

The expenditure on RandD, which represents 0,79 per cent of the GDP, is low in comparison with the 2,15 per cent of GDP of the OECD countries. It should be doubled in the next three to four years. The fact that the universities in South Africa are not adequately equipped and that some equipment is obsolete was stated as far back as 1992 and again highlighted in the National Research and Technology Audit in 1998. The audit emphasised that '*... only 10 per cent of the country's equipment base at the time could be considered as state-of-the-art, i.e. less than five years old*' (A National Key Research and Technology Infrastructure Strategy July 2004). The replacement value of the equipment is R3.7 billion. According to some experts, the new subsidy formula for 2004 provides even less funds for the purchase of research equipment.

The number of subsidised research outputs is diminishing. Large inequalities exist between ethnic groups and institutions in higher education. There are indications that the differences between universities are increasing rather than decreasing. By the year 2000, whites still produced 91,9 per cent of all outputs, Africans 2,6 per cent, coloureds 1,19 per cent, and Asians 4,4 per cent. (Boshoff and Mouton

2003: 220). Five universities produce 60 per cent of the total research output in the sector. Contract research has increased rapidly. However, the quality of the contract work is often suspect. Some historically disadvantaged universities produce hardly any output at all. The new subsidy formula will encourage all universities, including the new universities of technology, to strive to become research universities. An investigation undertaken in 1997 indicated that '*... academic science in South Africa ... was conducted within rather confined disciplinary and institutional enclaves*' (Mouton 2004).

The ageing of the science population and the fact that there is an inadequate inflow to the system are probably the greatest threats. The research output in the age group above 50 years is increasing, while the output of the age group below 50 years is decreasing (Boshoff and Mouton 2003: 221). Affirmative action is having the effect that some white academics do not see a future for themselves in academia. The composition of the staff has not changed dramatically over a decade. From 1988 to 1998 the percentage of Africans increased from 30 per cent to 38 per cent and that of whites decreased from 55 per cent to 47 per cent (Cloete *et al.* 2003: 200). Salaries in the higher education sector have fallen significantly behind that of the public and private sectors. It will be indicated in a later section that there is a strong mobility of blacks in the academic sector as a result of shortages and promotions. It is difficult to calculate the extent of the effect of HIV/AIDS, but statistics indicate that it could be extensive.

There is an ongoing debate on the extent and influence of the so-called brain drain. The reason is that statistics on emigration are unreliable and that many highly trained individuals do not leave the country permanently. A recent (2004) investigation, which was undertaken for the National Council on Innovation and entitled *Flight of the Flamingos*, found that 'South Africa is faced with a strong resource constraint surrounding highly skilled individuals', but that there is no proof of a brain drain crisis (p. xvii). [7] It is also not certain how many of the highly trained individuals will return. An important statement that is made is that if there is a perception that the research system is weak or that it erodes because there are few posts or sources available, an even larger number of individuals will attempt to find opportunities in other countries. As already indicated, there is a large measure of mobility of black scientists between sectors before they make a significant contribution in certain posts. It is especially disconcerting that top scientists leave the higher education and research institutions for managerial

posts in the public and private sectors. Research funding from abroad has increased rapidly since 1994. One research university already receives 20 per cent of its research expenditure from abroad.

In summary it can be said that South Africa may eventually have sufficient financial resources for its scientific practice and higher education, but that the human resources may be insufficient.

There is a marked decline in RandD in the private sector. In the four years to 2002, the number of researchers declined by 16 per cent (National Research and Development Strategy 2002: 54).

As far as the science councils are concerned, the Human Sciences Research Council and the Agricultural Research Council should be highlighted. Human sciences research has never figured relatively strongly in the research system. Poor methodology, insufficient statistical grounding, a variety of schools of thought, ideological differences and divides (English, Africans, black, white) together with the academic boycott in the apartheid years had a detrimental effect on the system for several decades. Nevertheless there can be no doubt regarding the important role that research in the human sciences can fulfil by analysing changes in the socio-economic and political fields and by communicating relevant knowledge efficiently through information and communication systems. **[8]**

There has been an ongoing debate on whether the Human Sciences Research Council should continue to exist (Bawa and Mouton 2003: 325). Its personnel complement has been reduced and significant changes have been made to the course that it was taking. Certain research divisions were closed down or transferred to universities. It could be accused of too much direct competition with universities and technikons for research funds. However, the universities do not have the infrastructure to do the national surveys that the Human Sciences Research Council undertakes successfully. My personal observation is that a new generation of human science researchers is emerging who analyse issues fearlessly, objectively and critically.

The Agricultural Research Council (ARC), which was established in 1992, has undergone major changes and crises (Liebenberg *et al.* 2004; Thirtle, Van Zyl and Vink 2000). The focus has been shifted from large commercial agriculture to emerging black farming units; and from highly subsidised agriculture and price protection by marketing councils to competition within world markets. A

combination of factors, including the lack of leadership, has had the effect that the number of research personnel at the ARC decreased from 761 in 1996 to 634 fte researchers in 2000. The number decreased further to 400 by April 2003. Large numbers of highly qualified researchers left the ARC precisely during a period when research could have contributed in respect of the structural problems in agriculture and the land reform process.

Finally, some international benchmarks could be considered. Bundlender (2003: 257) says that *'Given its relative wealth, South Africa performs less well in HRD indicators, education, health and labour'*. According to the World Competitiveness Index (2001), South Africa holds the 42nd position among 49 countries.

It is in the fields of Mathematics and Science that the performance at the school level is especially poor. Of the 440,267 candidates that wrote the school-leavers examination (grade 12) in 2003, only 82,010 (18.7 per cent) passed with exemption to enrol for higher education. The number of candidates that obtain exemption has remained reasonably constant over the past few years. Of the candidates that obtained exemption, only 23,088 (28 per cent) passed Mathematics and 25,972 (31 per cent) passed Science on the higher grade. Many experts are of the opinion that the large increase from 1999 to 2003 in the number of grade 12 candidates that passed, ostensibly without a drop in standards, is simply too good to be true. The pass rate of grade 12 pupils was 48.9 per cent in 1999 and it increased to 73 per cent in 2003. The number of poorly prepared candidates that enter the tertiary institutions is increasing. In 2004 it was announced that 40 per cent of students fail their first year.

Part II

Land reform: a complex issue that requires interdisciplinary, applied research

Few topics in these countries (South Africa and Zimbabwe) have been more widely discussed but less understood than land reform (International Crisis Group 2004)

Introduction

Land reform has been chosen as a focal area because it has far-reaching consequences. These consequences encompass the following crucial areas: Political (race restructuring), economic (alleviation of poverty and job creation in rural areas) and social (change in the communal land ownership system that has a

radical effect on the social order of traditional communities, as well as the moving of millions of people, which may be even more extensive than the social engineering of the apartheid years). Furthermore, more than 20.4 million people (46.3 per cent of the total population) live in the rural areas (Strategic Plan for the Department of Agriculture 2004: 11). More than 70 per cent of the rural population is poor and approximately 27 per cent live below the bread line.

In a broader African context, it is said that NEPAD (New Partnership for Africa's Development) '*... believes that agriculture will provide the engine of growth in Africa*' (Comprehensive Africa Agriculture Development Programme 2003). Land reform may have major national and international consequences and it may influence the food security of the poorest of the poor in Southern Africa.

Contextualising the place and role of agriculture

In order to gain a clear understanding of the land reform process, it is necessary to put into perspective the place and role of agriculture in the South African economy. Although agriculture contributes just more than 3.9 per cent to the GDP, it has important backward and forward links with the national economy. As a consequence of low rainfall and relatively poor soil, only 13 per cent of the surface of the country can be used for crop production and of this area only one-fifth is high-potential arable land. A little more than 1.3 million hectare (1.19 per cent) are under irrigation (Strategic Plan for Agriculture). Between 50,000 and 60,000 commercial (mainly white) farmers farm on 87 per cent of the total agricultural land, which is highly developed, and they account for more than 95 per cent of the total agricultural production. As in many countries, agriculture is not very kind to farmers. Since 1965, commercial agricultural production increased slower than the national economy with the result that the 9.129 per cent contribution to the GDP in 1965 decreased to 3.2 per cent in 2002. Various structural changes in agriculture and globalisation have been the cause that many farmers have lost their farms and that the agricultural debt increased by more than 3 per cent per annum from 1991 to reach R31 billion in 2003.

Events preceding the land reform programme

Land occupation by indigenous groups in southern Africa occurred over many centuries. With the arrival of white settlers, the conflict intensified. In 1655 the indigenous people had already built their huts near the Fort at Table Bay and were requested by the colonists '*... to go a little further away*' (Davenport and Hunt 1974: 11). The first division of land occurred in the Western Cape when the

Salt River and the Liesbeek River were accepted as the dividing line between the indigenous people and the colonists (Davies 1971: 5). Over a period of 300 years it eventually led to South Africa having '*... one of the most unequal land distributions in the world*' (Binswanger and Deiniger 1993: 451). The problem of land reform is currently a topical issue in virtually all the countries in Southern Africa.

Both the previous government and the ANC paid a great deal of attention to land reform during the struggle. After 2 February 1990 various national and international conferences were held on this issue.

The current land reform process commenced with the acceptance of the Interim Constitution in 1993. It was essentially aimed at correcting the wrongs that were brought about by the Natives Land Act of 1913 and the Natives Land and Trust Act of 1936 in terms of which blacks' land rights were limited to approximately 13 per cent **[9]** of the country. Besides these two acts, a host of other laws were also promulgated over the years, which led to the blacks being dispossessed of their land rights and to population shifts. It is estimated that '*... 3,5 million people were forcibly removed from their land between 1960 and 1982*' (Aliber and Mokoena 2004: 330). The limitation of blacks' land rights and subsidies granted to commercial farmers supplied labour to the mines and led to large-scale distortion in agriculture (Thirtle, Van Zyl and Vink 2000: 6-21).

The intricate legislation passed to set the land reform programmes in motion, such as the Restitution of Land Rights Act No. 22 of 1994, and the Land Claims Court that was established, are not discussed in this context. (In this regard see *The Law of S.A.* Vol. 14 1999). Land reform comprises three basic processes, namely:

- Restitution or return of land that was expropriated and that led to, for example, large-scale removal of people or communities;
- Redistribution of land directed at assisting the poor, farm workers and especially black women to obtain land; and
- Changing the land ownership system, mainly in the former homelands where communal land ownership is the most general form of land ownership.

Land claims could be instituted from 1994 to 31 December 1998. In total, 79,649 claims were registered. It is a comprehensive task to evaluate the validity of the claims, identity documents, title deeds etc. Corruption is also inherent in the process.

Of the more than 55,000 claims that have already been concluded, approximately 80 per cent concerned urban areas. By March 2004, 2.9 per cent of the agricultural land (former homelands excluded) was transferred to blacks at a total cost of R4.6 billion (Hall and Laliff 2004: 1). Thus far restitution has received the greatest attention. Although a great deal of land in urban areas has been returned to former owners, criticism has been expressed that the easy route was taken by giving the claimants cash instead of land (*Business Day* 18 August 2003). Land reform on farms is more complex. Changing the communal land ownership system has vast political and social implications.

Land reform, which is protected by the Constitution, is one of the great achievements of the government. Thus far the process has proceeded very slowly. Research is revealing how complex the issue is. Much criticism has been expressed, especially of the unrealistic expectations that are being created (Walker 2004). Researchers do, however, agree on one matter, namely that those countries that do not undertake land reform successfully, run the risk of paralysing civil unrest and violence.

The land reform process gained new momentum in July 2004 when the Department of Agriculture released a document entitled AgriBEE, Broad-Based Black Economic Empowerment Framework for Agriculture. The most important aims of the document are summarised below.

The Established Industry (Agriculture) undertakes to:

- Contribute to the realisation of country's objective of ensuring that 30 per cent of agricultural land is owned by Black South Africans by the year 2014;
- Contribute to an additional target to make available (20 per cent) of own existing high potential and unique agricultural land for lease by Black South Africans by year 2014;
- Make available 15 per cent of existing high potential and unique agricultural land for acquisition or lease by 2010;
- Support legislative and development initiatives intended to secure tenure rights to agricultural land in all areas;
- Make available 10 per cent of own agricultural land to farm workers for their own animal and plant production activities.

The Sector undertakes to:

- Eliminate by 75 per cent the rate of illiteracy within farming communities by year 2008;

- Eliminate completely the rate of illiteracy within farming communities by year 2010;
- Ensure that all workers in the secondary and tertiary level of the sector are functionally literate and numerate by year 2010;
- Establish training programmes for farm and enterprise workers in appropriate technical and management skills by July 2005;
- Collaborate in ensuring maximum use of resources of the relevant Sector Education and Training Authorities (PAETA), Food and Beverage Sector and SETAs to achieve the above targets;
- Institute a sector-wide young professionals employment and mentoring programme, which targets 5,000 black unemployed and underemployed graduates per annum for the next five years in all disciplines, starting in 2005 financial year. Mentorship programmes shall be accredited by the relevant SETA or other agreed authority.

The way in which this framework was released, elicited a great deal of criticism. It was said that there had been a breach of trust, because organised agriculture, which had cooperated in the establishment of a new framework, had not been consulted in regard to the final edition of the document. Furthermore, it was pointed out that unrealistic expectations were being created and that there were neither the funds nor the infrastructure to achieve the stated aims. Thereafter the Minister of Agriculture did a great deal to effect damage control and invited institutions to make inputs towards a final framework by the end of 2004. Is it a symbolic policy that is not really intended for implementation? The most important preliminary findings have been indicated. Although this is a critical analysis, an attempt has been made to avoid value judgements. Furthermore the analysis does not question the necessity of land reform.

Schools of thought, models and expectations

As in the case of science and higher education, in many cases policy formulation on land reform has been strongly influenced by experts from abroad. The assistance that has been received has also often been accompanied by particular inputs and conditions. For example, land rights are based on Roman Dutch Law and elements of English Law, with some accommodation of the customary law of Africans, and it is susceptible to differing interpretations.

Hereafter a number of the relevant aspects are highlighted:

- There is a fundamental difference between the value that the most Westerners attach to land and the value that Africans attach to it. This aspect probably

underlies the problems that are experienced in respect of land reform. Westerners view land as a means of production that has a market value. The black man has never been a crop farmer and farmed with cattle in a context in which numbers were more important than quality. In many traditional communities the woman was and still is the crop farmer. It is for this very reason that the criticism is expressed that black women are not given sufficient assistance to obtain land. Davidson and other researchers (London Review of Books 1994b) shed light on the metaphysical considerations in respect of ancestral land that motivated the Mau Mau murders in Kenya. He points out the differences between 'them' and 'us'. The Kikuyu did not lose a large area of land. *'But what they crucially did lose was all assurance of control over ancestral forest and fields that had been theirs from "time out of mind", they lost, it could be said, their environment'*, and as a result a 'Land and Freedom Army' was established *'... In line with Kikuyu ancestral concepts of the difference between good and evil, between success and failure, eventually between life and death'*. After many years it now becomes clear what the underlying reason for the murders was. In South Africa, the whites are particularly ignorant about the meaning that land has for blacks, i.e. the homes and graves of their ancestors.

Following from the preceding discussion, there is an open debate on whether blacks, especially the younger generation, are interested in becoming farmers. My research in the 1980s indicated that young black men who do not have a regular job in urban areas, earn more money than their brothers who till the soil in the African sun. The aspirations and expectations of the youth are more prevalent amongst urban blacks than in amongst rural blacks.

Surveys reveal that the majority of blacks have a desire for a relatively small area of land on which they can live and can farm to provide in their own needs. A broad-based attitude survey found that one-third of the respondents indicated *'... no interest in additional farm land, and another third wanted one hectare or less'* (Zimmerman 2000: 16). This is clearly an area in need of further research.

- It is clear what the political objectives of land reform are, namely the correction of inequalities by means of race restructuring. Some researchers believe that politics is the main driving force. It is for this reasons that high expectations are created by urban politicians who do not grasp the complexity of farming. Others believe that economic objectives - alleviation of rural poverty, work creation and general economic growth - should be the main driving forces.

-There are two strongly divergent schools of thoughts on how land should be

divided and rural poverty alleviated. A school of thought of the World Bank, which is supported by prominent South Africans, states that '*... our research shows that efficiency and employment in South African agriculture would increase if average farm size were to decrease in the commercial farming sector and increase in the former homelands*' (Thirtle, van Zyl and Vink 2000: 303).

Another school of thought holds the view that the aforementioned opinion is ideologically driven. Only large commercial farms can afford new technology and negotiate prices. There are, however, many examples in the world in which agricultural production has been increased by the subdivision of land, but these countries do not have the uncertain rainfall and poor soil that South Africa has. Sender and Johnston (2004: 144) say that there is no empirical proof of successful small farming in Africa and that '*... many economists arguments for land reform amount to an ideologically driven search for something that does not exist, namely efficient and egalitarian family-operated small farms that are likely to provide an escape from poverty for millions of the poorest rural Africans*'. Davidson (1994: 275) points out that neither capitalistic nor socialistic systems have been successful in Africa. Africa, like South Africa, requires its own unique solutions.

The school of thought that advocates an enlargement of the land of black households, bases its argument on surplus labour that is available. Empirical research indicates that this surplus does not exist. Productive men are away as migrant labourers. The women, children and elder persons that are left behind, spend most of their time fetching water and gathering firewood.

- Another aspect that still requires a great deal of research is the question whether blacks are willing or able to move to new land. Zimmerman (2000: 1) summarises a number of obstacles as follows: '*... the poor have less inclination to move the distance demanded by the redistribution, have less labour available for farming, are less able to afford the program's upfront costs, have fewer farming-specific skills, and have less capacity to cope with agricultural risk*'. The question is also asked regarding where poor black people will find the funds for transport to a new home where basic infrastructure has to be created. Many are unwilling to exchange their social networks for new homes where they face an uncertain future.

If the objective is achieved of having 30 per cent of agricultural land in black ownership by 2015, it will involve social engineering that will probably exceed that of the apartheid years.

- It is probably too early to make a final judgement on the influence of the

alleviation of poverty in rural areas. One group points to the marginal success, the other highlights failure (Neto 2004). There is no proof of job creation on the new land. Statements made by the government have led to approximately 200,000 farm workers losing their jobs on commercial farms. Sender and Johnston (2004: 158) conclude that '... over the last decade, redistribute land reform in South Africa has had adverse effects on the standard of living of very large numbers of the poorest rural people. They did not require any land and suffer from declines in the rural wage earning opportunities that are crucial for their survival'. [12] Land reform should be part of a wider rural economic restructuring process.

- Changing the communal land ownership system is a complex and a politically highly explosive enterprise. Communal land ownership, in which the power of the traditional leaders is largely vested, is the cornerstone of the social system in many African countries. On this issue, too, there are different schools of thought. One school of thought believes that communal ownership does not permit any individual initiative and does not offer access to credit. Another school of thought stresses the utility value of communal ownership and the safety net that it offers many poor black people (Hall, Jacobs and Lahiff 2003: 22). Research reveals that chiefs' power over land is rejected in some areas and applauded in other areas. The Communal Land Rights Act (2004) is intended to give title deeds to the inhabitants of tribal or trust lands. It will have a far-reaching effect on the lives of more than 7 million people in the former homelands.

- There is a variety of other aspects that should be taken into account and that cannot be discussed in any detail. One such aspect is that the current approach departs from the point of view that black communities are homogeneous, while there are large differences between ethnic groups and between various areas. Research indicates that the demand-driven approach can lead to the establishment of a black elite of owners to the detriment of the poor. Thus far the process has been driven by some (urban) elite with little input from rural communities (Levin and Weiner 1997: 4). Some observers say that the process is being retarded because it has become '*... over-centralised and bureaucratic*' and the state '*... tries to do everything*' (Kirsten *et al.* 2000). Lastly, researchers refer to the fact that land reform could have far-reaching implications for sustained development, biodiversity and the preservation of, amongst other things, national parks (De Villiers 1999).

- Research indicates that the HIV/AIDS pandemic may have a major influence on land reform. One aspect is particularly important, namely that the law of inheritance should give ownership to the women whose husbands die of AIDS.

- A shortage of funding is one of the strongest reasons why only 2.9 per cent of the agricultural land has been transferred to blacks. Funding for land reform has never yet exceeded 0.5 per cent of the national budget (Hall and Lahiff 2004: 1). It is being asked whether the funding is in line with the expectation that has been created that 30 per cent of the agricultural land should be in black hands by 2015.

The Landless Peoples Movement and the South African Communist Party have already made threats. There are no comprehensive estimates of what the total cost will be. The 2004/5 allocations in the budget include R474 million for land reform, but it is estimated that at least R1 billion will be needed. The implementation of the Communal Land Rights Act will amount to R1 billion per year over the next five years, '*... equivalent to over 70 per cent of its current budget for all aspects of land reform*' (Hall and Lahiff 2004: 3).

The preceding discussion gives rise to the question whether the government can continue with its current policy of 'demand driven and willing buyer, willing seller'. There have already been calls to farmers to reduce the price of land. A committee was appointed by the Minister Agriculture and Land Affairs in 2004 to investigate the purchasing of the land of foreigners and the increase in land prices.

A lack of funds, the inability of the government to conclude land claims speedily and to select and train black farmers, can lead to illegal land invasion. In fact, it has been pointed out that "the history of land reform around the world demonstrates that land invasions, which governments then normalize through legal processes of expropriation and allocation, have been the most common and effective processes of land reform (Van Zyl, Kirsten and Van Binswanger 1996: 10). A legal framework should attempt to reduce the probability of such action being taken. It is being asked whether the current legal framework is advantageous for land reform. Various cases have gone the long route through the high court and the appeal court to the constitutional court.

A possible strategy and the role of research

It is important not to be overwhelmed by the complexity of the problem. International donors have largely failed to form a coherent strategy and the complexity of land reform makes it difficult to justify aid. Research indicates that the process is proceeding too slowly and has failed in certain respects. Various researchers state that the entire programme should be reconsidered and that a

new vision should be formulated. In the first instance, land reform should form part of a broad rural development programme. Secondly, experience in other countries indicates that centralised ministries or parastatal institutions do not always implement land reform successfully. The civil society (communities, farmers, organised agriculture, unions, NGOs, commercial banks, research institutions, traditional leaders etc.) should be involved. An information and communication system is a precondition for success. A foundation or forum for land reform is advocated where the best experts, nationally and internationally, can provide inputs, which involves the civil society and the private sector and which can provide independent advice and assistance.

The aforementioned illustrates the necessity of research. The extent of the interest in land reform in South Africa is astounding. Commendable work has been produced by agronomists, land ownership specialists, economists, sociologists etc, but *'there has been little systematic effort to synthesise their findings and combine them with intensive field research to produce practical policy recommendations for both local actors and the international community'* (International Crisis Group 2004: v). In particular, there is a lack of fieldwork that indicates, among other things, the large spatial differences between heterogeneous groups. There is an urgent need in respect of the following fields: Historical research on the validity of land claims; the attitude of blacks towards land in general and towards farming in particular; the best way of selecting black farmers and providing them with training, mentorship, finance or agricultural extension in respect of crop varieties and the marketing of seed; an effective information and communication system; literacy programmes etc.

Universities in the Netherlands have, over a period of more than 100 years, made huge contributions to the training of South African academics and researchers. The Netherlands has had an immeasurable influence through constructive criticism and even an academic boycott to bring about a just and fair South African society. In the late eighties and nineties, I benefited a great deal from universities and academics in the Netherlands in my endeavour to establish a system of self-evaluation and quality promotion at the University of Pretoria.

In some respects the task of the Netherlands has been made easier by the fact that a democratic government was established in South Africa in 1994. In some other respect the task is more daunting, because the issues that face science and technology and higher education at present are even more challenging than in the

past. The new generation of academics and researchers look forward to co-operating closely with the Netherlands in the future in the building of a just and better future for all inhabitants, not only in South Africa, but also in Southern Africa. In the fields of science and technology South and southern Africa cannot afford to fall farther and father behind the industrialised nations.

Notes:

- 1 Research on infectious diseases was neglected.
- 2 54,2 per cent of the total expenditure in 1987 to 12,4 per cent in 1997.
- 3 With the exclusion of the medical sciences.
- 4 The NRF (8 October 2004) states clearly that it '*...will support research only within these focus areas*'.
- 5 If reasonable throughput rates of 20 per cent had been achieved 25,000 more graduates would have been produced.
- 6 '*... that the ministry will be able to plan the country's highly skilled human resource provision efficiently by determining how many students may be admitted to which programmes*' (SAUVCA April 2004).
- 7 Specific sectors, such as public health, were not investigated and it is precisely in these sectors that many medical doctors are leaving the country.
- 8 In 2003 the NRF commenced the development of a National Research Agenda for Social Sciences, Law and Humanities.
- 9 This percentage should be qualified. The western part of South Africa is a semi-desert with a sparse population. The eastern part of the country accommodates the majority of the population on relatively fertile land with a high rainfall. These facts do not, however, mean that the country is not unfairly divided.
- 10 '*41 per cent of the Africans in the agricultural section had no schooling*' (Strategic Plan for the Department of Agriculture 2004: 42).
- 11 Sector Education Training Authority.
- 12 Land claims on the largest tea plantation in South Africa near Tzaneen are the main reasons why production will be terminated. More than 10,000 workers will lose their jobs.

References

- AgriBEE Broad-Based Black Economic Empowerment Framework for Agriculture (2004).
- Department of Science and Technology (2004) A national key research and technology infrastructure strategy, abridged version, Pretoria.

Aliber, M. and Mokoena, R. (2004) *The land question in contemporary South Africa. The state of the nation*, Pretoria.

Bawa, A. and Mouton, J. (2003) 'Research', in N. Cloete *et al.* (Eds) *Transformation in Higher Education*, Landsdowne: Juta and Co.

Binswanger, H.P. and Deiniger, K. (1993) 'South African land policy: The legacy of history and current options', *World Development* 21(9).

Boshoff, N. and Mouton, J. (2003) 'Science policy indicators', in *Human Resources Development*, Pretoria: H.S.R.C.

Bundlender, D. (2003) 'International benchmarks', in *Human Resources Development*, Pretoria: H.S.R.C.

Business Day (2003) 18 August.

Cloete, N. *et al.* (Eds) (2003) *Transformation in Higher Education. Global pressures and local realities in South Africa*, Landsdowne: Juta and Co.

New Partnership for Africa's Development (NEPAD) (2003) *Comprehensive Africa Agriculture Development Programme*.

Davenport, T.R.H. and Hunt, K.S. (1974) *The right of the land*, Cape Town: David Philip.

Davidson, B. (1994) *The search for Africa. A history in the making*, London: James Currey.

Davidson, B. (1994b) 'The motives of Mau Mau', *London Review of Books*, XVI(February).

Davies, W.J. (1971) *Patterns of non-white population distribution in Port Elizabeth with special reference to the group areas act*, Institute for Research Planning, Port Elizabeth: University of Port Elizabeth.

De Villiers, B. (1999) *Land claims and National Parks - The Makuleke Experience*, Pretoria: H.S.R.C.

Department of Arts, Culture, Science and Technology (1996) *White Paper on science and technology. Preparing for the 21st Century*, Pretoria.

File, J. and Goedegebuure, L. (2000) *Thinking about the South African Higher Education landscape*, Pretoria: Council on Higher Education.

Flight of the Flamingos. A study on the mobility of RandD Workers (2004), Cape Town: H.S.R.C. Publishers.

Gibbons, M. *et al.* (Eds) (1994) *The new production of knowledge. The dynamics of science and research in contemporary societies*, London: Sage Publications.

Government of the Republic of South Africa, Department of Science and Technology (2000) *National Research and Development Strategy*, Pretoria.

Hall, R., Jacobs, P. and Lahiff, E. (2003) *Programme for land and agrarian studies*,

Cape Town: University of the Western Cape.

Hall, R. and Lahiff, E. (2004) Budgeting for land reform. Programme for land and agrarian studies, Cape Town: University of the Western Cape.

International Crisis Group (2004) Blood and soil. Land, politics and conflict prevention in Zimbabwe and South Africa, Belgium: International Crisis Group.

Kraak, A. (2000) Changing modes. New knowledge production and its implications for Higher Education in S.A., Pretoria: H.S.R.C. Publishers.

Levin, R. and Weiner, D. (Eds) (1997) No more tears. Struggles for land in Mpumalanga, S.A., Trenton, N.J.: African World Press.

Liebenberg, F. *et al.* (Eds) (2004) Agricultural science and technology indicators 14 (March).

Mouton, J. (2004) Some notes on interdisciplinarity in the sciences, draft, 12 June.

Neto, F. (2004) 'Innovative approaches to rural development. Moving from state-controlled towards market-based land reform', National Resources Forum 28(1): 50.

SAUVCA (South African Universities Vice-Chancellors Association) (2004) Comments, April.

Scott, P. *et al.* (Eds) (1995) The meaning of mass Higher Education, Buckingham: SRHE and Open University Press.

Sender, J. and Johnston, D. (2004) 'Searching for a weapon of mass production in rural Africa: Unconvincing arguments for land reform', Journal of Agrarian Change 4(1 and 2).

Strategic Plan for the Department of Agriculture, 2003 to 2006 (2003) Pretoria.

The Law of South Africa (1999), Vol. 14, Durban: Butterworths.

Thirtle, C., Van Zyl, J. and Vink, N. (Eds) South African agriculture at the crossroads, Basingstoke: Macmillan.

Von Gruenewaldt, G. (2004) South Africa 2014. What the future holds. High level HR development and future competitiveness, National Research Foundation, unpublished.

Van Zyl, J., Kirsten, J. and Binswanger, H.P. (1996) Agricultural land reform in South Africa, Cape Town: Oxford University Press.

Walker, C. (2004) The land question in South Africa. The challenge of transformation and redistribution, Pretoria: H.S.R.C.

Zimmerman, F.J. (2000) 'Barriers to participation of the poor in South Africa's land redistribution', World Development 8(8).

About the Author:

Flip Smit – Former Vice-Chancellor, University of Pretoria