

EDUCATION AND CHANGE MANAGEMENT IN AFRICA: A NEW FRAMEWORK FOR HUMAN CAPITAL DEVELOPMENT IN AGRICULTURE'

By

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EDUCATION AND CHANGE MANAGEMENT IN AFRICA: A NEW FRAMEWORK FOR HUMAN CAPITAL DEVELOPMENT IN AGRICULTURE

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ABSTRACT

This study describes the nature of human capital development (HCD) in agriculture and rural development, and its implications on current programmes in the high institutions of higher learning. This is in view of the fact that the majority of Africans are still "trapped" in an under performing rural and agricultural environment; and even emerging and developed economies on the continent still depend on agricultural performance to stimulate economic growth, food security and poverty alleviation. A framework is developed relating human capital to specialist role players in the agricultural and rural environment and challenges for human capital mobilisation in a number- of specialist fields to impact positively on agriculture. This is then related to case studies in the South African environment and some generalizations and an agenda for change management are proposed.

1. INTRODUCTION

Major political, social and economic changes are in progress in most countries in Africa. Important themes within the concept of an "African Renaissance" are related to democratisation and the addressing of inequalities of access to, and the acquirement of resources and economic opportunities. Rural development and human capital development is targeted as important cornerstones of many programmes in this context (Acker, 1999.). Such an approach will have a major impact on current educational programmes require transformation and change management processes throughout most tertiary education institutions in Africa and other developing world.

The paper firstly highlights on the first conference of the Global Consortium of Higher Education and Research in Agriculture (GCHERA), then it describes the nature of human capital in agriculture and rural development.

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2. THE GLOBAL CONSORTIUM OF HIGHER EDUCATION AND RESEARCH FOR AGRICULTURE (GCHERA)

The GCHERA consortium was established in an attempt to coordinate and provide a framework within which the agricultural universities worldwide can collaborate. The consortium held its first global meeting in July 1999 in Amsterdam. The mission statement is "To foster global cooperation for the improvement of higher education and research for agriculture as a prerequisite to solving the food security and environmental problems confronting the world."

During the first conference a number of observations were made relating to reform of higher education for agriculture including the societal context for reform (Jischke, Topel & Acker, 1999); they included

- **Global nature of trends** impacting on higher education and research for agriculture are global. There are variations specific to local conditions but the challenges confronting agricultural universities are very similar, whether the institution is located in a developing or developed economy.
- **Reform in higher education must accompany societal reform**
Socio-political shifts are occurring all over the world. The global shift toward market-driven economics has enormous implications for higher education. Those universities that have invested and adapted themselves to keep up with changes in their national economies are on the forefront.
- **Successful reform efforts depend on a number of factors**, including external assistance, funding and leadership.
- **Engagement:** The success of a university depends to a large extent on its ability to stay in touch with and to serve communities outside of its border.
- **Globalisation** is important, but requires strategic alliances and an investment of resources.
- **Resources:** Although additional resources may be needed to implement changes, some action can proceed without massive additional funding, drawing on benefits of cooperation nationally and internationally.
- **The stakes are high**, there is urgency associated with the issues of food security and environmental sustainability.
- **Institutional leadership** is critical to ensure implementation of required change.
- **The value of networking** cannot be over-emphasized. It assists to harmonize planning, develop a shared vision and exchange information with shareholders.

Other partners active in institutional reform are willing to cooperate with the consortium; these include, amongst others, the OECD, FAO, UNESCO and the Global Forum on Agricultural Research.

3. HUMAN CAPITAL IN AGRICULTURE

Types and products of human capital: Human capital is a wide, all encompassing topic. Clarity on relationships between types of human capital skills in agriculture and the products and returns which they are associated with is therefore important. In Table 1, Human Capital Development (HCD) outputs or products are presented in a hierarchical fashion. Each product is an important productive input into the human capital production process below and above it (Evenson, 1988; Van Rooyen, Barnard & Van Zyl, 1998; Swanepoel, Van Rooyen & Stroebel, 2000).

It is argued that the central activity of human capital in agricultural development is to be found in **Agricultural Innovation**, as typified by a new crop variety or synthetic animal breed, or those inventions, which relate to mechanical, biochemical, chemical and electrical aspects applicable to the agricultural process. Derivative modifications of these inventions have direct on-farm application, Communication on the relevant technical aspects and price information will promote the use of an invention through rational technical choice and farm management decisions by farmers.

Human capital development related to the activity levels above agricultural innovation in Table 1, also matters greatly because they determine the production system of pre-invention 'germplasm'. Germplasm is used in a ~7cneral sense to include not only genetic resources and chemical materials but new methods and concepts that is of an intellectual nature.

The planned and continued production of germplasm in its many forms is a critical activity in agricultural development. It is therefore particularly important to structure the investment programmes directed at applied, strategic and basic research actions, policy formation, etc. to produce relevant and appropriate germplasm. In this respect the concept of general science and technology is important. General science and technology focuses on the strategic and basic research, which provides the foundation for new germplasm and the resultant derived products, i e. invention, sub-invention, on-farm level application, etc. In addition to the mentioned human capital products, Van Rooyen et al (1996) argues that police- choice processes, i e political lobby, policy making, governance, etc., influence all the mentioned processes and must consequently be viewed as vital for IICD processes. This extension of Evensons' framework enables the inclusion of these particular HCD activities, which are presently crucial for agricultural restructuring in South Africa.

Having identified the activities of human capital, more needs to be said about the various role players and specialists involved in the mobilisation of these. These are shown in Table 1. (Stroebel, Swanepoel, Van Rooyen, Rwelamira

& Korsten, 2000). The main focus of each role player and the important linkages and human capital products required for an efficient structure are indicated.

Specialist Groups/Role Players/Human Capital Specialists

(i) Farmer groups and agribusiness

In the HCD process farmers and agribusiness groups should assimilate human capital products related to farm management and technology- choice decisions, mainly through interaction with extension workers, development facilitators and subject matter specialists. Inputs by farmers into technology inventions and even pre-invention germplasm must be viewed as crucial and should be accommodated through the interaction of farmers in a fanning systems research approach with these multi-disciplinary specialists.

The link between farmers and public policy dimensions is interesting and important. When the concept of policy choice is viewed as an interaction to ensure agricultural support through policies, fiscal allocations and public programmes, farmers could have an impact through farm lobby groups (Bates, 1990). This dimensions has proved to be a very powerful and productive element of human capital formation for South African commercial farmers through "Organised Agriculture" in South Africa (Van Zyl & Vink, 1989). Part-time, small scale and emergent black farmers have had little or ineffectual political lobbying and impact on the required human capital mobilisation for their development (Brand et al, 1992). however, this situation has improved through activities of for example the National African Farmers Union (NAFU) in South Africa, similar bodies in Southern Africa and the recently established Southern African Committee of Agricultural Unions (SACAU).

TABLE 1: HUMAN CAPITAL DIMENSIONS IN AGI11Ct1LTURE

| 5.2. Description Activity | 5.3. HUMAN CAPITAL SPECIALISTS | | | | | | |
|----------------------------------|---------------------------------------|--------------------------|----------------------------|--------------------|------------------|--------------------------------|----------------------------------|
| | Farm Producers/ | Development facilitators | Subject matter specialists | Applied scientists | Basic Scientists | Planners, Admin, lobby groups@ | Politicians <i>policy makers</i> |
| 7 Policy choice dimensions | XXX | X | XX | X | X | XXX | XXX |
| 6 General Science & Technology | | X | X | XX | XXX | X | |
| 5 Pre-invention germplasm | X | X | XXX | XXX | XXX | X | |
| Agricultural innovation | XX | XX | XX | XXX | XXX | XX | X |
| 3 Information communication | XXX | XXX | XXX | XX | X | XX | XX |
| 2 Technology choice decisions | XXX | XX | XX | X | | XX | X |
| 1 Farm/business management | XXX | XX | X | X | | X | X |

Including advanced and indigenous decisions Farm organizations

X = modest knowledge base

XX = medium knowledge base

XXX = advanced knowledge base

(ii) Development facilitators

The mission of development facilitators (earlier referred to as extension officers) should focus on information communication to inform and assist farmers with decision making on technology choice and farm and business management. Invention processes provide an important opportunity for development facilitators to participate in farm systems research, although this aspect should not be viewed as the main function of extension and facilitation. The impact of these specialists must be viewed as marginal on aspects such as technology invention, germplasm, general science and policy choice dimensions. Development facilitators should primarily view their responsibility in the human capital formation process as "brokers of knowledge and information" and to provide a vital facilitating link between farmers and the research/training system. This should have a strong impact on the structuring and development of the knowledge definition process and organisation in agriculture.

(iii) **Subject Matter Specialists (SMS)**

The importance for multi-disciplinary collaborative and needs-driven teams, comprising of **economists, veterinarians, technical production specialists, including animal, plant and engineering specialists and development facilitators and rural sociologists**, to activate productive linkages in the technology development and delivery system is self-evident. Inter/multi-disciplinary teams will have a vital role to play in the diagnosis and of farming problems for referral to training and research levels. These teams should also be able to interpret policy and basic and applied research into on-farm research, sub-invention design, programmes and extension messages. The training of SMS should focus on the creation of subject matter and multi-disciplinary knowledge, the ability to integrate this information into production systems, the management of technology transfer and delivery linkages.

The focus of this category of specialists should be on invention while interacting with **farmers, development facilitators, other SMS's and applied agricultural scientists**. The link between SMS and farmers, through development facilitators, must be viewed as of extreme relevance in generating productive innovation. To increase rural productivity, the activation of the linkage will be of vital importance. The institutional and organisational and spatial deployment of SKIS should receive high priority in order to link

invention into proper information communication, technology choice and management decisions (see, amongst others, Low 1995).

(iv) Applied Scientists and Basic Scientists

The important role of these categories are obvious. It remains important that policy and budget allocations enable these professionals to stimulate and expand the "frontiers of knowledge".

(v) Politicians, Policy Makers, Planners and Administrators and Organisation Lobbyists

The ability to manage the human capital transfer linkages remains a crucial requirement for **efficient policy choice** and decision making for agricultural development. This has to be achieved across institutions, at inter institutional levels as well as at national and regional levels, and must be viewed as even more important than organisational structure *per se*. The training of the executive corps in the fundamental principles of systems management, policy analysis, public choice management and management of change' must be viewed as essential for efficient human capital mobilisation within the agricultural system.

Some international evidence: Investment in human capital in agriculture has recorded high and productive returns. In the past 30 **years numerous studies** on the role and impact of research, training and other human capital products in agriculture have been made. Almost all studies supported the basic proposition that human capital, whether in the form of basic literacy, or in more advanced understanding of germplasm, invention and sub-invention, technical relationships and management principles, has economic value because it enables more efficient resource use and more productive farming enterprises. In assessing more than 50 human capital studies in international agriculture Evenson summarised the following general findings (Evenson, 1988; Peters & Hedley, 1995):

- a) There is a fair amount of evidence showing high impact from investment in agricultural extension facilitation and schooling programmes. It is, however, difficult to isolate the impact or contribution of a single type of human capital investment to productivity. A number of studies of schooling-income relationships found that the assumption that other types of HC,D investments were constant, had very little validity, even in a cross-section of farms in a small region. Other types of human capital investment had air important effect on the returns to schooling. It was, for example, found that even farmers with a high-level of schooling would be considerably worse off if the flow of new technology and access to financial services were to be halted.
- b) High returns were recorded on location specific subject matter activities and farming systems research. Due to this finding, national farming system

research programmes have undergone major expansion in many developing countries. For this reason the Consultative Group on International Agricultural Research (CGIAR) system with institutions such as ICRISAT, IRRI, CYMMIT, etc. has been developed and is presently directed to support national agricultural research systems (NARS) to exploit the high economic and social returns on research investment.

- c) In contrast to the documented record of high returns on human capital investments in agricultural research, extension and schooling, there has been relatively little evidence of high returns on human capital investments in large scale development projects even though substantial expenditure on these have been made.

From these perspectives it can **firstly** be concluded that, rather than arguing the relative importance of single types of human capital investment (farming systems research, subject matter specialisation, facilitation and extension, germplasm, development, schooling, etc.) and associated types of training for the upgrading of farming activities and welfare in rural areas, the interaction and complementary relationship of these various types of human capital development programmes should be optimised. From this analysis the types or "package" of human capital required can be established within a programme context. This approach will assist in establishing "missing links" and identifying unproductive elements. Secondly it can be stated that the products of HCD in agriculture, as identified in Table 1, must be complemented with HCD investment in related activities such as schooling, in infrastructure, etc. From these findings it can **thirdly** be concluded that human capital development in agriculture generally does record positive returns. This investment should, however, not be confined to development projects *per se*, but should rather be driven by a broad-based programme approach whereby support is offered to agricultural specialists and farmers in a broader community context. Where development projects are used as "a cutting edge for development", mechanisms to allow human capital development and capacity development to extend beyond the boundaries of a project should receive priority.

The African scene: The restructuring of the African agricultural sector will place considerable demands on the current HCD system. One of the main problem areas relates to the current demarcation between training, extension and research systems serving agriculture. These systems also find it difficult to co-ordinate, in view of the provincialization of agriculture and because of certain missing or under developed linkages in the HCD matrix. One example is the absence of focused agricultural economic research and the obvious gaps in SMS and development facilitation linkages. These gaps are, for example, clearly illustrated by a recent study on the gaps in the agricultural services structure, required to support rural livelihoods (Van Rooyen & Bembridge, 1996). Themes such as food security, farmer development, gender equality, agribusiness linkages and also "new" and delivery systems are not geared to serve them.

Initiatives, such as the establishment of a national system of science innovation, may address this problem effectively. The Science and Technology Foresight project in South Africa will also serve to inform prioritisation and planning in this regard. The

formation of a formal MARS for a country may further contribute significantly towards addressing the current demarcation.

4. CHALLENGES FOR THE TERTIARY EDUCATION SYSTEM

4.1 New paradigm for higher academic institutions

Higher academic bodies such as a university, is by its nature a social institution with a unique character and function. However, a university is also part of a larger social setting in which it is in constant interaction with a variety of other institutions and systems. It is an inherent feature of the modern university that it must not only pursue universal academic values and ideals, but must also fulfill its role and task in a particular society. It is essential for the survival of a university that, in its planning for the future, it should take cognisance of the changing forces and needs in its universal and particular contexts. In order to identify the forces and needs that have a bearing on the survival and recognition of the higher academic institutions serving South Africa, several general facets of both the *universal and national contexts* of the university system should be taken into account.

The following are some of the most important facets of the **international context** of the university system:

- Continuous change in the number and diversity of the clients to be served;
- new tasks and responsibilities assigned to universities;
- governments' dramatic cutback of the subsidies provided for tertiary education, with the effect that universities must achieve a greater measure of cost-effectiveness;
- rapid changes occurring in the labour market in which the universities' graduates must make a career for themselves;
- rapid progress in science and technology;
- the necessity of applying interdisciplinary and multidisciplinary approaches and methods in training and research; and
- increasing application of information and communication in tertiary training and research.

These trends find expression in a changing relationship between government and university. National governments reserve the right to determine the policy on higher education, especially on financing, while they increasingly devolve the responsibility for growth, innovation and diversification in higher education to individual institutions. It is against this background that restructuring at tertiary institutions is taking place with the aim of creating a better learning environment for students. The restructuring is primarily being pursued by decreasing the use of the lecturer-oriented training paradigm and increasing

the use of the student-centered training paradigm. The necessity of providing effective training to an increasing number of students, without a proportional increase in resources, means that universities can only survive and grow if they make significant, and even radical, changes to their administrative structures and training models. Student-centeredness implies that in our thinking about the future we must discard some of our conventional ideas: instead of emphasizing the productivity of the lecturer, we should emphasize the productivity of the student; instead of emphasizing their scientific interests, lecturers should emphasize what the students ought to learn; and instead of concentrating on lecturers' teaching styles, we should concentrate on students' learning styles. In this regard Professor Mal Logan of Monash University envisages the following future situation: *smaller institutions battling to survive and larger institutions struggling to turn their operations around in order to adapt to changing demands, deliver more cheaply and maintain or enhance quality.*

Viewed in a **national context**, universities are a primary driving force in the communities they serve. The role of the university in the process of nation building and establishing basic value systems is increasingly being acknowledged and rewarded. In this regard, the task for the present is contained in the confluence of the past and the future. The tasks, traditions, rituals and social impact of the University have never before been challenged so decisively by political and socio-economic realities. The relevant question in this regard is not whether the universities should concern themselves with the country's socio-economic and technological problems, but rather whether universities are fulfilling their responsibilities adequately. Inequalities in society are far more evident at universities, particularly in the fields of science and technology. Some of the challenges facing universities in South Africa at present are the increasing number of students who have different learning needs; the increasing complexity of scientific and technological knowledge; insistence on relevant and career-oriented training; increasing demands for community service; and insistence on accountability.

How should universities react to these changes and challenges? The obvious answer to this question is that universities should develop a realistic strategy for the future. The concepts of *relevance*, *diversity* (more specifically, diversity in and among universities and programmes), *quality*, and *internationalisation* are key considerations in the development of a strategy for the future and for determining the resultant priorities. The basic principles for developing a strategy for the future are policy *formation* and the awarding a greater importance to *technology*, with a continuous emphasis on increased *efficiency* and *effectiveness*.

In an Africa context a view on higher education institutions, as carriers of HCD strategies, must be complex because the situation on the continent is so diverse. However, some lines can be drawn for HCD in agriculture due to the many common themes that emerges- These will now be addressed.

4.2 Agricultural education and training: future challenges

Training in faculties of agriculture will increasingly be directed towards problems experienced in poverty stricken rural areas. Topics such as nutritional analysis, food production systems, rural governance, project and programme planning and evaluation, rapid rural appraisal techniques, etc. are expected to become important components of many training programmes. In addition to training in the academic and (inter-) disciplinary agricultural subjects, the mastering of technical and social skills and the discourse on attitudes is increasingly important in the preparation of rural professionals at the higher level. The reality of additional formal agricultural education is that very little attention is paid to the effective domain of the teaching-learning process (Van den Bor, 1996). Both staff and students were and still are inclined to think about higher learning in terms of pure cognitive development.

Required response from universities: Policy initiatives, processes and driving forces discussed, calls for a mode of delivery of teaching qualifications, which needs to be adopted and changed drastically. The South African case is used to illustrate these points in Tables 2 and 3.

TABLE 2: CURRENT AND REQUIRED MODES OF DELIVERY AND TEACHING IN HIGHER AGRICULTURAL EDUCATION IN SOUTH AFRICA

NEW PRACTISE

| | |
|------------------------------------|-------------------------------|
| teacher centered | student centered |
| consumptive learning | discovery learning |
| theory dominated learning | dual learning |
| knowledge accumulation | problem orientated |
| content orientated learning | self-regulative learning |
| institutional staff based learning | external human resource input |
| low level cognitive learning | high level cognitive learning |
| knowledge transfer | didactic counselling |

The increased need for network positioning globally and in Africa and the changing internal and external sources will force institutional management to change its policy in different ways, as indicated in Table 3. This could be equally applicable for African countries.

TABLE 3: THE REQUIRED CHANGES IN HIGHER AGRICULTURAL, EDUCATION TEACHING AND TRAINING INSTITUTIONS' POLICIES AND FINANCIAL STRATEGIES IN AFRICA

| CURRENT POLICY FOCUS | NEW POLICY FOCUS AND FINANCIAL STRATEGIES |
|-------------------------------|--|
| Institutional isolation | Local/regional networking |
| National positioning | international networking |
| Sectoral positioning | inter-sectoral positioning |
| Financial security management | balancing priorities and resources |
| Transitional "shop-minding" | creative stewardship of physical infrastructure |
| Salary administration | reward system management |
| Outputs in terms of quality | outputs in terms of quality |

*Source: compiled/adapted from Van den Bor, 1996

5. CASE STUDIES

The Agricultural Faculty at the University of Pretoria provides a number of case studies to illustrate HCD and the transformation of strategies in the context discussed herein.

5.1 Changes in the Agricultural Faculty of the University of Pretoria: Achieving social and financial equity

A decade ago the Agricultural Faculty at the University of Pretoria, traditionally a "White only" institution, consisted of 17 departments (Agricultural Economics, Agrarian Extension, Food Science, Soil Science, Agronomy, Pasture Science, Weed Science, Horticulture, Genetics, Poultry Science, Small Stock Science, Large Stock Science, Biochemistry, Microbiology, Plant Pathology, Entomology and Biometrics). With (too) many departmental heads and 4 experimental farms, overheads were high and it was not surprising that this faculty was a major headache for the University as it was making a "loss" of around R8 million per annum. Declining enrolment from the traditional market of "white" Afrikaans speaking students was partly the reason why this faculty was not financially sustainable any longer.

Towards the end of 1991 a process was started for de-racialization of the faculty, rationalization and amalgamation of departments, which reduced the number of departments to six. A Post Graduate School of Agriculture and Rural Development was established, in 1991, to focus on the needs related to developing agriculture in the region with the emphasis on topics such as food security, land reform, project analysis and management, farming systems research and rural tourism agribusiness management, land use planning to name a few new directions. A drive to attract black students and staff was also undertaken through bursary and research assistant employment schemes. A more liberal language policy led to more non-Afrikaans speaking students entering the faculty. A new English language graduate program, catering specifically for the needs of students who graduated at Historically Disadvantaged Universities, increased the number of graduates by more than 200 students.

A further process was initiated which brought the life sciences and agricultural sciences under one "roof" in the form of a new faculty of Biological and Agricultural Sciences. This new faculty consisted of departments from the old (restructured) agricultural faculty and some departments from the Faculty of Science. The faculty comprised of the following Departments: Agricultural Economics, Extension and Rural Development; Plant Production and Soil Science; Genetics; Microbiology and Plant Pathology; Food Science; Zoology and Entomology; Botany; Animal and Wild Life Sciences and Biochemistry.

This process was completed in 1993 and the new structure provided flexibility in degrees and enabled students to move with greater ease between degree options and also assisted in more multidisciplinary research work. The new Faculty was a great success and made a substantial "profit" for the university. This was a major achievement and a good example of how an institution of higher learning can be "turned around" - to use the corporate terminology to achieve both "social equity" and "financial equity".

The political changes and new challenges facing higher education has made continued restructuring necessary. A thorough assessment of the successful and well established universities in the world indicated that universities with strong semi-autonomous schools (colleges) with devolved powers and funding are more successful than those relying more on centralized management structures through large faculties, etc. During 1999 this proposal of the "strong school model" was investigated and debated and finally implemented by the end of that year. A new larger faculty of Natural and Agricultural Sciences was created, which has the following Schools: School of Agricultural and Food Sciences; School of Biological Sciences; School of Physical Sciences; School of Mathematical Sciences.

The School of Agricultural and Food Sciences has only 5 Departments (Agricultural Economics, Extension and Rural Development; Animal and Wildlife Sciences; Plant Production and Soil Science; Food Science; Consumer Science) but includes all the traditional agricultural disciplines such as agronomy, soil science, horticulture, animal breeding, etc. One component of the School of Biological Sciences, namely Plant Pathology also found a natural home in this school since most of its application is in agriculture and especially in post harvest technology. The only newcomer to this group of disciplines was the Department of Consumer Sciences (formerly Home Economics). This department focuses largely on how the consumer utilizes commodities (food and fibre) produced by the agricultural and food industry. Many cultural and socio-economic factors determine eating patterns and clothing fashions and the study of these aspects are ultimately very important for the success of any industry.

At first, many people frowned upon the idea of including this Department with the "aggies". However, the more one talks about the changing agricultural and the food industry world-wide and accept the increasing importance of knowing the needs of the consumer and producing the product the consumer wants,

the more one realizes the logic of this step. It is appropriate to say that this group of departments cover the whole agricultural supply chain - from 'farm to table' or from "conception to consumption". The importance of efficiently managing the food or textile product through all the stages of the supply chain is now more important than ever in the light of the increased competition in world food and fiber markets. Thus, this newly formed School of Agricultural and Food Sciences will make a major contribution to a more holistic training of students to enter the agricultural, food and textile industry in the countries of the Southern African region and assist such industries to compete effectively in the world market. This system provides for a much more interactive system required to serve HCD processes as described in section 3.

5.1.1 The Post Graduate School of Agriculture and Rural Development

The Post-Graduate School of Agriculture and Rural Development in the Faculty of Agricultural and Biological Sciences at the University of Pretoria quickly grew into the largest post-graduate facility in agriculture and rural development education in Southern Africa. The number of students enrolled under the auspices of the School at Doctoral, Masters and Honours level increased from a mere 56 in 1991 to stabilise at around 200 during the past three years. It is impressive and encouraging that in 1999, for the first time ever, more than 100 students enrolled for the M Inst Agrar degree. The role of the School in the Faculty of Biological and Agricultural Sciences cannot be overemphasized. In 1999 it provided approximately one third of all the post-graduate students in the Faculty.

From the outset the School focused on the new requirements for successful and sustainable agriculture and rural development in Southern Africa and elsewhere in the world. Poverty alleviation is the major problem facing Southern Africa. Of the 181 million people living in the SADC region, about 70% live in rural areas, where the proportion of the population below the poverty line ranges from 50% to 90%. It is essential, therefore, that architects, engineers, building scientists, geneticists, agronomists, lawyers and other "mainstream" professionals should apply their minds to the problems facing rural people and their livelihood systems and environment.

Among other things, this means that the researchers, extension officers, industrialists, educators and policy and decision-makers of the future should understand large-scale as well as small-holder farming systems. They should be trained to consider the socio-economic circumstances, needs and capacity to adopt change, of the potential beneficiaries of a project. They have to be innovative and able to improve standard methods, products and resources, be prepared to learn from global experiences and eager to promote and implement more effective and efficient methods. The students graduating from the School's programmes are therefore regarded as people who will provide leadership in the planning and management of agricultural and rural development. They can be divided into two categories, namely:

- *Specialists in a particular discipline who understand rural development issues.* These are practicing professionals who specialize in rural activities; their rural development training adds value to the specialist profession. These students graduate with an Honours or Masters degree from their specific department, having completed the core unit in rural development offered by the School.
- *Specialists in rural development, with a sound knowledge of one or more disciplines focused on an integrative area of analysis and practice.* These are "generalists" educated in a number of disciplines, who operate in a leadership or facilitating role in and among rural communities. Their subject matter education adds value to the ability of the graduates to manage and direct rural development. These students graduate with a B Inst Agrar Hons or M Inst Agrar degree.

A unique component of the School is a structured, systematic and well co-ordinated **Outreach Programme** geared towards increasing the impact of the School's contribution to rural outreach. Through this programme the School strives to respond to the challenges of agriculture and rural development of South and Southern African rural areas, where there is concentration of poverty. The programme is an instructive element and a vehicle through which postgraduate students are able to apply their professional knowledge to practical situations in a holistic, collaborative and rural people focused manner, with rural communities as centres of innovation. In the process, students are able to plough back something into the communities while they gain better insight and experience of the development challenges in the rural areas.

These initiatives, in conjunction with the new modes of thinking and models for collaboration introduced since 1991, give credibility to the School as an excellent source of urgently needed professionals with the knowledge, skills and inclination to improve the quality of life of rural people.

5.1.2 Agribusiness Training

The "new" school system furthermore provided the opportunity to allow a range of new entrepreneurial academic activities whereby the industry and the agriculture research system (ARS) could be incorporated as partners to the learning and research process. A number of academic chairs, partly sponsored by the industry, are already in effect within the School. The ABSA Chair in Agribusiness Management, established in 1998, is one such an initiative.

Agriculture became much more business focused in response to issues such as globalization deregulation and a "free market" orientation. These changing circumstances in the agricultural sector clearly require new skills to address the challenges. Effective curricula must reflect and respond to employer's needs and be constructed within a sound educational paradigm.

This ABSA Chair was introduced with the close collaboration of the industry through the initiatives of the Agricultural Business Chamber (ABC) of South Africa. Through these initiatives ABSA, a major commercial bank in South Africa with substantial agricultural interests agreed to support the activities of the Chair on a grant basis- The main focus areas will be:

- o the business environment in which agri-food business and fibre industries are operating (including emerging agribusinesses);
- o the future local and global agri-business environment; and
- o training, education and research to support the above foci-

The Chair will be responsible for three main programmes, namely, academic training programme, research and outreach. The four main activities will be conducted under the training programme, vis. a MBA programme in Agri-Food Business Management, a Master of Science programme in Agricultural Economics: Agribusiness Science; an M Inst Agrar programme in Agribusiness focusing on developing agricultural situations; and executive level short courses/seminars. Masters and PhD level studies will also be promoted.

The preceding discussion confirms the need for a new initiative in agribusiness management at academic training institutions. The scope is clearly far wider than traditional academic training in Agribusiness Management, Farm Management and Agricultural Economics. It however remains within the challenge of the applied discipline of Agricultural Economics to design and engineer such changes. A link to generic business and management training and to combine training with research and development and with outreach activities through partnerships with industry is furthermore required.

6. AN AGENDA FOR CHANGE: LESSONS FROM EXPERIENCE

Foster (1999) at the first conference of the Global Consortium of Higher Education and Research for Agriculture, identified the following issues that need to be addressed as higher education makes the transition into the twenty-first century:

- Increased partnership and collaboration between and amongst institutions and with the private sector. According to Dlamini (1999) this might include some of the following:
 - *Use advisory boards made up of leading experts in a number of sectors to work with specific schools and departments.*
 - In Swaziland this option resulted in a College (the Faculty of Commerce) built by the private sector for the provision of human resources for the commercial sector;
 - *Establish an office to promote internships with locally based, private profit and non-profit institutions, as well as with*

government, as is the case with the outreach programme of Post Graduate School discussed above.

- *Support research on the relationship of the state, the private sector, and civil society;*
- *Establish visiting professorships with the private sector so that knowledgeable people from civil society, the private sector and government become engaged in teaching at the university; Emphasize the benefits for important community, service by students;*
- *Encourage students to become mobilized by allowing them to elect representation to the university's senate;*
- *Develop research collaboration with the private sector;*
- *Foster an entrepreneurial spirit aimed at the public good (these are called social entrepreneurs) or the private good;*
- *Emphasis on sustainability in agriculture and community development;*
- *Improved emphasis on learning rather than teaching as an organizing framework within the university; Greater use of diversity and participation in designing and planning future direction and programmes; Accelerated responsiveness to the changing demographics (especially in South Africa) that impact both current services and future directions;*
- *Curricular changes that better prepare future professionals for the challenges of a dynamic, global agriculture and food system;*
- *Innovation with respect to the faculty reward and incentive systems that encourage both effectiveness and efficiency;*
- *Move to "outreach" as a parallel organizing framework to research for the future (University of Pretoria example); and*
- *Use of information systems and distance education technologies to expand both impact and access.*

7. CONCLUSION

The only thing we can be sure of is that we, within the responsibility to drive human capital development, are all in the middle of something very big and very different. New realities call for new ways of thinking about our business and the way we manage them. In this paper the value of a Human Capital Development (HCD) approach was emphasized. It can be concluded that without a HCD focus no institutional transition to accommodate the huge challenges of an "Africa Renaissance" will be met- Good luck to us all with this huge task and responsibility.

8. REFERENCES

ACKER, D.G_ (ed) (1999). Proceedings of the Inaugural Conference of the Global Consortium of Higher Education and Research for Agriculture. Amsterdam, Netherlands.

BATES, R.H. (1990). The political framework for agricultural policy decisions. In: Eicher, C.K and Staats, J.M. (eds). *Agricultural Development in the Third World*. The Johns Hopkins University Press, Baltimore.

BRAND, S.S., CHRISTODOULOU, N.T., VAN ROOYEN, C' J. AND VINK, N. (1992). Agriculture and redistribution: A growth with equity approach. In: Schrire, R. (ed). *Wealth or Poverty' Critical choices for South Africa*. Oxford University Press, Cape Town.

DI,AMINI, 13.M (1999) Public and Private Partnerships. *Proceedings of the Inaugural Conference of the Global Consortium of Higher Education and Research for Agriculture*. Amsterdam, Netherlands.

EVENSON, R.E. (1968). Human capital development and productivity change. *Agriculture and Governments in an Interdependent World*. IAAE Conference, Buenos Aires, Argentina

FOSTER, R.M. (1999). From Local to Global: The Challenge of Change in Agriculture and the Food System. *Proceedings of the Inaugural Conference of the Global Consortium of Higher Education and Research for Agriculture*- Amsterdam, Netherlands.

JISCHKE, M.C., TOPEL, D.G. AND ACKER, D.G. (1999). A Global Perspective on Change in Higher Education for Agriculture. *Proceedings of the Inaugural Conference of the Global Consortium of Higher Education and Research for Agriculture*. Amsterdam, Netherlands.

LOW, A. (1995). Reorientation and research of extension for small farmers: requirements for effective implementation. *Agrekon*, 34 (1): 1-9.

PETERS, G.H. AND HEDLEY, D.D (1995). Agricultural competitiveness: Market forces and policy choice. *Proceedings, 22nd International Conference of Agricultural Economists*. Dartmouth, England.

SOUTHERN AFRICA DEVELOPMENT COMMUNITY (SADC) (1997). A strategic framework for food security in the region. FSTAU: SADC paper, Harare, Zimbabwe.

STROEBEL, A., SWANEPOEL, F. J. C., VAN ROOYEN, C.J., RWELAMIRA, J. AND KORSTEN, L.

(2000). A South African perspective on paradigm change in Tertiary Education and Training. *Proceedings of the 9th Congress of the Asian - Australasian Association of Animal Production Societies and 23 Biennial Conference of the Australian Society*

of Animal Production, University of New South Wales, Sydney, Australia. July 3-7. 13 Supplement July 2000 C:191-192.

SWANEPOEL, F.J.C., VAN ROOYEN, C.J. AND STROEBEL, A. (2000). Developing Specialist Skills: A Framework for Human Capital Development in South African Agriculture. *Proceedings, Second World Conference of Professionals in Agronomy*. Mexico City, Mexico.

VAN DEN BOR, P. F. (1996). Higher agricultural education and rural restructuring in the Republic of South Africa. A series of seminars presented in the RSA. Department of Agricultural education. Wageningen Agricultural University.

VAN ROOYEN, C.J. AND BEMBRIDGE, T. (1996). Structuring services to support small farmers: Western Cape Case Study. Rural Livelihoods Project, DBSA/LAPC/ODA.

VAN ROOYEN, C.J., BARNARD, R. AND VAN ZYL, J. (1998). Agricultural education and training in South Africa. In Van Rooyen, C.J., Groenewald, J. Nqgangweni, S.S. and Fenyas, T.I. (eds): *Agricultural Policy Reform in South Africa*. AIPA/Francolin Publishers, Cape Town.

VAN ROOYEN, C.J. AND SIGWELE, H. (1999). Towards regional food security in southern Africa: a (new) policy framework for the agricultural sector. *Food Policy*, Vol. 23, No. 6, pp 491-504, 1998.

VAN ZYL, J AND VINK, N. (1989). Technology and farm production in South Africa. Paper read at the Techno-economic Society of South Africa, Johannesburg.