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TERTIARY EDUCATION AND
HUMAN RESOURCE NEEDS IN SOUTH AFRICA:

An Overview

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INTRODUCTION

1. Although it is premature to expect an operational human resources plan for a post-apartheid South Africa, it is important to establish broad training objectives and priorities in line with political and economic goals. Whatever happens during the course of the political struggle in South Africa, education and training will remain a central issue.

2. The first part of this paper examines the available evidence concerning the requirements for higher level personnel (HLP) in South Africa both in the immediate future and, more tentatively, after liberation has been achieved. In Section 2, the provision of tertiary education and training within South Africa is reviewed in the light of this assessment of future needs.

HIGHER LEVEL PERSONNEL REQUIREMENTS: STATE AND EMPLOYER PERSPECTIVES

Methodological Issues, Definitions and Data

3. A comprehensive statistical assessment of human resources in South Africa is impossible given the fragmentary nature of official data. The administrative exclusion of the Transkei, Bophuthatswana, Venda and the Ciskei (TBVC) as they became "independent" poses serious problems for any overall statistical analysis of human resources in the country as a whole¹.

4. The National Manpower Commission (NMC) defines "higher level manpower" as "all persons engaged in professional and semi-professional occupations, technicians and management personnel of all kinds". HLP can be sub-divided into two tiers. The first comprises of professional occupations that require individuals with university education. The second tier is made up of occupations that fulfill the NMC definition of HLP, but only require 2 years of specialised training after Standard 10.

Population and Urbanisation

5. Before examining South Africa's occupational structure it is necessary to have some understanding of demographic trends. In 1985 the total population of South Africa was estimated at 33.8 million,

¹ Although the racial categories employed in official statistics are artificial, they are used here of necessity. Thus, the paper refers collectively to those who are not white as "black", or to each racial group (African, Coloured, Indian and White) separately.

with 27.9 million in the "Republic" and a further 5.9 in the nominally independent TBVC areas. By the year 2000, it has been estimated that some 70% of the black population will live in urban areas. With the current rate of decline in the white birth rate and falling immigration, Africans will soon constitute the vast majority of the population from whom HLP need to be trained and employed. At the same time, black unemployment is soaring. Although there are regional disparities, most non-official estimates put the overall rate of unemployment among blacks at around one in two.

Overall Trends in Employment and Occupation

6. Since the early 1960s, high levels of economic growth based increasingly on sophisticated capital intensive production methods have enhanced the demand for more technically skilled and better trained workers. With the exception of agriculture, employment in most sectors of the economy expanded considerably in the 1960s and 1970s. Employment growth has been the highest in the service industries and the public sector. Even before the removal of job reservation in the late 1970s, many employers recruited blacks into semi-skilled jobs previously occupied by whites. Much of this recruitment was not reflected in official statistics.

7. The growing size and complexity of the South African economy has meant that HLP has assumed greater importance, although these jobs have continued to be dominated by whites. Another important change in the labour market has been the increasing participation of women, albeit at lower levels in commerce and industry. However, the most striking feature of South Africa's occupational structure is the continued slow pace of black advancement within HLP occupations, particularly among the professions.

The Composition of HLP

8. The segmentation of HLP occupations by race and gender continues to be very pronounced in South Africa. Whites comprised nearly 70% of HLP in 1985, whereas African, Asian and Coloured representation was only 20%, 3% and 7% respectively. (see tables 4 and 4.1). Long standing sexual discrimination is a dominant factor in these labour markets, with women tending to be relegated to the low income and low status "caring" professions like nursing and teaching.

HLP Shortages

9. The response of the Government to shortages of HLP has traditionally been to encourage the immigration of people with the required occupational skills. During the 1960s and 1970s 25-40% of net annual additions to the HLP stock came from immigration. However, immigration has fallen off considerably in the 1980s due to economic recession and political instability and it is now recognised by the NMC that most HLP will in future have to come from inside South Africa.

10. Official vacancy rate statistics fail to reflect accurately the underlying issues of skills utilisation and the quality of skills that are available. Despite these reservations, official vacancy rate data are the only indicators available to measure skills shortages. Shortages tend to be acute during times of economic boom and significantly, except for a few HLP occupations, these shortages have generally disappeared when recession has set in. Between 1980 and 1985 the most persistent shortages were recorded amongst the following groups: paramedical, nurses, agriculturalists and "other" professional. Although the extent of these might be exaggerated, 90% of recorded vacancies are in the public sector. The private sector has consistently "poached" trained personnel from the public sector.

Critical HLP Shortages

11. Apart from vacancy rate data, other qualitative evidence does indicate that the development of the South African economy and the industrial sector in particular has been seriously constrained as a result of skill shortages in four key HLP areas-information technology, engineering, management and accountancy.

Information Technology

11.1. There is general agreement that the fastest growing industries in the future will be in the service sectors where advanced information technology is likely to play a key role. Evidence from leading companies suggests that during the 1980s, South Africa has suffered a critical shortage of HLP skills in electronic data processing, systems analysis and higher level programming. Faced with such skill shortages, many positions in the electronics industry have been filled by under qualified people. The demand for personnel with high-tech skills will undoubtedly grow further in the future.

Professional Engineers

11.2. As the economy has become more complex, the demand for university trained engineers has grown rapidly. However, the supply of locally trained personnel has not risen enough to satisfy these demands. Studies sponsored by the Federation of Societies of Professional Engineers (FSPE) have concluded that South African training institutions can at present satisfy no more than half to three-quarters of the normal annual demand for 2000-3000 new engineers. Most types of engineers (except civil) have been in persistently short supply in the 1980s, particularly those with high-tech experience. In 1985, the Manpower Committee of the FSPE pointed to severe shortages of heavy current electrical, chemical and mechanical engineers. Accordingly to the NMC, in 1985 there were only six Africans were professional engineers (outside of TBVC). The FSPE expects the supply of

qualified black recruits will still be a "mere trickle" by the early 1990s.

Managers

11.3. Shortages of professionally trained managers are a serious problem in South Africa. The NMC concluded in 1987 that:

"The management corps has shrunk too low to cope properly with the mobilisation of resources and productivity."

Most industrialised countries have much higher ratios of managers to unskilled workers than South Africa. The shortage of management skills has clearly been aggravated by the "brain drain" of professional whites leaving South Africa and taking up jobs overseas. Despite the recent expansion in the numbers of black managers, they still only constitute around 5% of the management groups enumerated in the Manpower Surveys. The Human Sciences Research Council (HSRC) predicts annual growth in demand for managers to be approximately 3% up to 1995. Most of this growth will have to come from the black community.

Accountants

11.4. This is another professional group likely to experience shortages in the future as a result of the high rates of emigration at the present time and low levels of training for blacks. Black advancement in this area has been extremely limited with the NMC recording only 20 fully qualified African chartered accountants out of a national total of 12,000 in 1989. Estimates in 1987 anticipate that the shortfall of qualified accountants will be around 7000 by the turn of the century.

Future HLP Requirements

12. The NMC predicts that there will be an escalating demand for black HLP into the next century. The black share of HLP is expected to rise from 26.5% (1980) to approximately 43% by the year 2000, mainly as a result of the slow growth of the white population. However, it is unlikely that economic growth rates in South Africa will be as high as predicted due to international isolation and declining industrial productivity.

13. These demand predictions take little account of the influence of utilisation factors on the level of demand for HLP. These could be significantly reduced in the future by improving the deployment and utilisation of HLP, for in the past that there has been a pervasive tendency for professionals to devote too much time to tasks which should be performed by middle level personnel.

14. Mathematics and science teaching at both secondary and tertiary levels clearly provide the necessary intellectual grounding

for all four of the occupational groups mentioned above. Training provision in these subjects is of critical importance in facilitating black advancement. However, there are serious teacher shortages and under-qualification in the areas of mathematics and physical sciences for all the population. The level of teaching offered to the African population is particularly low, a situation compounded by large classes and disruption of schooling, which contributes to high failure rates in these subjects. These conditions have resulted in very low matriculation outputs in science and mathematics.

THE PROVISION OF TERTIARY EDUCATION

15. The pattern of tertiary provision reflects the divisive nature of apartheid education.

An Overview of Education Policy

16. Separate university education has been a central feature of apartheid education policy since the late 1950s. During the height of the 1960s economic boom, the overall objective of Government education policy was to improve the quantity and quality of white "human capital" by expanding educational facilities at all levels. It was not until the 1980s that higher level black skills were seen as important to the economy. The reformist strategy introduced after the Soweto uprising in 1976 is intended to suppress political opposition to apartheid at the same time as winning the "hearts and minds" of the black majority. Subsequently, more funds were invested in black primary, secondary and tertiary education. In 1980 the De Lange Commission "Investigation into Education" was followed by legislation aimed at building up black human resources to service the South African economy.

Historical Background

17. South Africa has a complex and fragmented system of tertiary education. Universities in South Africa have traditionally served the educational needs of the middle classes, most of whom are still white. However, black university education dates back to 1916 with the founding of the South African Native College by missionaries, which was renamed the University of Fort Hare in 1952. Afrikaner universities were originally set up to counter Anglophone political and cultural influences. Of the nineteen universities in South Africa, ten offer full time courses for whites, of which five are Afrikaans medium, four are English medium and one, the University of Port Elizabeth, is nominally dual medium.

18. After 1959, universities in South Africa were not allowed to admit "other races" without official permission and that could only be granted if the course was not available at the respective "ethnic" university. The establishment of black tertiary institutions was part of the overall apartheid strategy which was to

impose administrative divisions on the population which were based on artificial residence and language criteria. From the 1970s onwards, new black universities were established in the bantustans. The only specifically urban African university outside of the bantustans is Vista University established in 1981 in the industrial heartland of the Transvaal, largely in response to demands from urban employers for a better trained black work-force. Most students at Vista are engaged in part-time or correspondence study.

19. Approximately 48% of total African university enrollments are at UNISA which, since 1951 has concentrated on correspondence education. UNISA and most of the black universities adhere to conservative educational philosophies and practices. These institutions have been the site of intense political struggle over the past few years. For example, the police and army at the University of the North (Turfloop) are in semi-permanent occupation of the campus. The only exception amongst the black universities is the University of the Western Cape, which has undergone a political transformation over recent years and under progressive leadership it has sought to promote democracy and maintain its autonomy.

University Enrollment

20. University education has been dominated by whites since its inception in South Africa. Whites comprise 15% of the total population but 45% of all university enrollment. Despite making up 70% of the population, less than 20% of university students are African and of these many are undertaking part-time correspondence courses. Nevertheless, the recent growth in black university enrollment has been large - an increase from less than twenty thousand in 1975 to nearly one hundred thousand or 40% of the total in 1987.

21. The most important feature of the past decade has been the movement of black students into the English speaking universities. Between 1977 and 1983 African enrollments at these universities increased more than threefold. However, these increases conceal a high rejection rate amongst African applicants to white universities compared with those of Asians and Coloureds. Despite the recent increases in black students attending English speaking universities, the black universities themselves still account for over 80% of full time enrollments. More attention should, therefore, be paid to the development of these institutions.

Technikons and CATES

22. Technikons and Colleges of Advanced Technical Education (CATE) are the main tertiary level training institutions for second tier HLP in South Africa. Their number has increased as the country has become more industrialised. CATES offer post-Standard 10 training in a wide range of subject areas, most notably the

biological, physical, health, chemical and agricultural sciences, and commerce, art, design and engineering. Technikons provide more advanced tertiary technical training and are quite similar to UK polytechnics. Compared with the university sector, training at the technikons and CATEs remains relatively undeveloped; total enrollment is less than half those at university. The facilities for HLP training for blacks are much more limited than for whites. There are presently seven technikons for whites, one each for Coloureds and Indians and two for Africans.

23. Since the beginning of 1988 white technikons have been able to admit students of all races subject to obtaining official permission. However, these institutions are still largely segregated along racial lines.

Colleges of Education

24. African teacher training institutions are administered by the bantustan education ministries while Coloured and Indian colleges are under their "own affairs" departments. Up until recently, white colleges were controlled at the provincial level but new structures will bring them under the Regional Service Councils (RSCs). Due to the lack of autonomy of teacher training institutions, integration has been virtually impossible. There are nineteen colleges of education for whites two for Indians and thirteen for coloureds.

25. There has been a relative decline in white teacher training and an increase in African numbers. Amongst all races there has been a shift away from colleges in favour of university based teacher training.

Women in Tertiary Education

26. Although the proportion of women amongst university students as a whole has increased since the mid 1970s, they remain poorly represented in science and technical fields. Most women at universities in South Africa take courses in arts, social science and education. Professional engineering continues to be a male dominated profession with white and black women accounting for 5.6% and less than 2% respectively in 1982. In the technikons and CATEs most black women are enrolled in secretarial, commercial and health science courses, with very few in the technical streams. The poor participation of both women and blacks in tertiary education reflects the mutually reinforcing dynamics of gender and race.

Fields of Study

27. Despite the increasing technical complexity of the South African economy, little change has taken place in the overall pattern of subject enrolment since the 1970s. The proportion of

engineering graduates actually fell between 1975 and 1985. Despite increasing African enrollment, their participation in mathematics, science and technical subjects remains low. Most Africans graduate in education, arts and the social science. The high proportion of education students in all of the three black groups is striking. The output of black graduates in second tier HLP management and technical areas is not keeping pace with demand.

Funding

28. The financial pressures on tertiary educational institutions are likely to intensify as demands for higher education from individuals and employers continue to grow. The number of African high school matriculants is expected to double by the year 2000. Since 1985, South African universities have had to contend with increasingly severe cuts in their recurrent and capital budgets. Government attempts to contain black student radicalism at the "open" universities by trying to impose stringent conditions on the dispensation of subsidies have been successfully opposed. However, all universities still face a prospect of expanding black enrollments with insufficient funds. The cuts have seriously reduced facilities at the universities and limited their capacity to provide financial assistance to the most needy students. The Department of National Education has accepted that some 80% of the running costs of universities should be met by the state since there is a limit to what is likely to be forthcoming from the private sector and foreign donors.

29. Some universities have already responded to these austerity conditions by curtailing the growth in student enrollment which will inevitably affect the inflow of black students into those institutions. There are also official plans to try and encourage technical and vocational education outside the universities.

The Problem of Access

30. Improving black access to South Africa's universities is a major challenge since it raises fundamental questions about the whole education system in South Africa. Various solutions to the problems of access to tertiary education were suggested by a study undertaken at the University of Witwatersrand in 1986. Issues such as alternative admission criteria to help black students, increased responsiveness to community demands, and academic support for whites as well as blacks were all raised in the context of educational restructuring in a non-racial South Africa.

Conditions inside the Universities

31. Not only is the pool of eligible black candidates small, but failure rates are very high, particularly in vocational areas like commerce and engineering. Black students are hampered by their poor educational backgrounds. Large classes, poor teaching and

authoritarian structures at university all help to compound the high failure rates. Failure rates among white students are also high, although for different reasons, with many treating universities as though they were "finishing" schools rather than places for serious study.

Academic Support

32. The last few years have seen the growth of Academic Support Programmes (ASP) to assist disadvantaged students at university with learning difficulties. These programmes work best if they are based in the relevant academic department. Between 40-50% of students in courses run by central ASP units are white - indicating that many white students are also unprepared for university education. However, black students are at a double disadvantage for not only do they have academic difficulties, but they also encounter serious problems with finance and accommodation. It is likely that university funding for these latter areas will be cut still further in the future.

Bridging Programmes

33. There is growing support from both employers and community groups for bridging courses between schools and university. These have emerged in response to the high failure rates among black students. The Anglo American Corporation runs a successful, although costly, scheme at the University of Witwatersrand for commerce and engineering students. However, at a broader institutional level it is felt that some kind of "junior college" approach, which would provide one year of preparation between school and university is a better long term solution to the high failure rates at university.

CONCLUSION

34. In recent years, overseas governments and other organisations (including those within the Commonwealth), have sponsored a number of different types of training schemes for disadvantaged South Africans both inside and outside of the country.

35. Training priorities cannot be established using rigid, ready made formulae. It is particularly important to distinguish between demands for skills in the immediate, medium and long term. Although these are interrelated, such temporal distinctions must be made in order to clarify goals and priorities.

36. Despite the difficulties with the official data outlined in Section 1, it is possible to assess the relative demand for certain types of professional and semi-professional skills in South Africa. The professions with the most serious shortages of personnel include engineering, accountancy, computer science and medicine.

37. In terms of the broader goal of black advancement, there are other professions like management and law which do not register large overall shortages but where Africans in particular are very poorly represented. The importance of developing a black leadership group with appropriate professional experience is widely recognised.

38. In the short and medium term it is important to focus on these areas of shortage for both economic and political reasons. Many of these core professions require a strong educational background in mathematics and science, which is deficient for most of the African population. Consequently, the training of teachers in these essential subject areas must be a priority.

39. There is considerable disagreement amongst educational planners on how to set priorities for human resource development. Some would argue that the South African context the most urgent task is to train blacks for the "essential" professions outlined above. Others assert that technical and vocational skills represent only a part of the human qualities and skills necessary for social transformation. Proponents of this view see the effectiveness of education in instilling key values and attitudes as equal to, if not more important than, the specific subject areas.

40. The paper has discussed some of the main obstacles facing blacks in tertiary education. The high wastage rates for all university students, but particularly Africans, makes imperative the need for effective career counselling. It is essential, that scholarship programmes make career counselling available at the outset in order to ensure that the course chosen is appropriate.

41. Work experience programmes should also become an integral part of vocational training for South Africans. This is primarily because of the barriers facing blacks who wish to enter the job market at higher levels. Not only is it difficult for blacks within South Africa to obtain job experience above a certain level, but critical areas of the economy are effectively closed to the black community - notably local and national government, and strategic economic sectors. It is important, therefore, to take a longer term view towards training and, more specifically, provide training programmes which have significant amounts of work experience built into them.

42. Improving access to tertiary education for the black majority is of primary importance. As discussed in Section 2, while there has been a rapid expansion in black university enrollment during the past decade, there are still blatant inequalities in terms of access to resources for higher education. The increase in overall enrolment figures disguises racial and gender disparities. Black women in particular are heavily concentrated in the two "caring" occupations, nursing and teaching and study mainly social science, arts and education at university. In the CATES and technikons, black women in particular still have minimal

participation in the technical courses. Black enrollments at CATES and technikons have increased considerably in the 1980s but there are still limited facilities and institutions for blacks who wish to follow technical courses, with racial segregation still being applied.

43. Black women are doubly discriminated against in South African society, and for this reason every attempt should be made by scholarship programmes to discriminate positively in favour of women students. In this regard, special funds should be made available for bridging courses between school and university and child-care for women involved in tertiary education.

44. Those most badly affected by the severe cutbacks in university budgets will be black students (particularly Africans), most of whom are dependent on some means of financial assistance. In these circumstances, it will be necessary for foreign educational agencies to extend their support to disadvantaged students inside South Africa.

45. At great deal of attention has been focussed on the efforts of the "Open Universities"² to admit more African students. However, in 1987 their combined admission levels were less than four thousand African students. The vast majority of African students still attend the "ethnic" universities which are racially segregated and have much lower standards of education.

46. The introduction of alternative selection procedures for tertiary institutions is another key issue. In the light of high university failure rates a more flexible range of educational practices are required in order to make tertiary education more accessible to the majority of the population.

47. The gross inadequacy of education and training opportunities of the majority population, and the needs of a transformed South Africa has made the education sector a priority for foreign donors - both governmental and non-governmental. As the timescale for liberation shortens, it will be important that available resources are concentrated in areas of critical significance. This can only be determined through consultation and dialogue with South African partner organisations, and external assistance should support the strengthening of the education and training organisations seeking to create a non-racial democracy in South Africa.

2 The "Open Universities" are a self-identified grouping of four english language medium universities (Cape Town, Natal, Rhodes, Witwatersrand) and the formerly "Indian" University of Western Cape. These five universities are committed to admitting students of all races.