Report MM-83

An analysis of the macro manpower demand and supply situation (1977 to 1987) in the RSA: aid to manpower planning at organizational level

1981

Human Sciences Research Council

S.A. Institute for Manpower Research

RGN-HSRC

An analysis of the macro manpower demand and supply situation (1977 to 1987) in the RSA: Aid to manpower planning at organizational level

Report MM-83

An analysis of the macro manpower demand and supply situation (1977 to 1987) in the RSA: Aid to manpower planning at organizational level

S.S. Terblanche

Human Sciences Research Council
South African Institute for Manpower Research
Pretoria
1981

S.S. Terblanche, B.Sc., B.A. (Hons.) HSRC

South African Institute for Manpower Research
Acting Director: S.S. Terblanche

ISBN 0 86965 820 4

Price R4,35 (GST included)

CONTENTS

TABLES

FIGURES

AN ANALYSIS OF THE MACRO MANPOWER DEMAND AND SUPPLY SITUATION (1977 TO 1987) IN THE RSA: AID TO MANPOWER PLANNING AT ORGANIZATIONAL LEVEL

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

An organization is in itself a kind of organic whole. In dictionaries the words *systematic, structure and order* frequently appear in the description of the word *organization*. One of the definitions that Webster (p. 586) gives, is *arrangements of parts or organs for the performance of vital functions*. This definition underlines the two main characteristics of an organization, namely that there is a certain structure and that the organization has a function and therefore an aim.

Some writers (Bass 1979; Miner 1969) use an input-output model to describe the functions of organizations. On the input side we find the three well-known M's (men, money and material) and on the output side the goods or services produced. The main aim of any organization is the efficient production of these goods or services (Megginson 1977: 1). The production can only be efficient if wastage is kept to a minimum.

According to McBeath (1978: 1) all employers have, theoretically, access to the capital market, technology and other physical resources. All the decisions on the application of these resources are made by people and differences in the efficiency of organization can, in the last instance, be ascribed to the quality of the human resources, which is a variable of the organization. This resource is an expensive one for any organization. The decision to employ a worker permanently can be compared to any other fixed investment, and the investment in human resources forms a large part of the investment of any organization. The census of manufacturing concerns in 1972 (South African Statistics 1978: 12.4 and 12.5) showed for example that the end value of fixed investments in ground, buildings and machinery amounted to R3 285 million while the R1 813 million was paid out in the form of wages.

The human input differs radically from other forms of input and investment. Capital and materials have no expectations and emotions. When a worker is appointed the employer does not get a fixed amount of energy or capacity. The human role in the production process can, however, also be described in terms of the input-output model (Miner 1969). On the input side one would find the skills, motivation and loyalty of the worker. The employer or organization does not only produce goods or services. To the worker the organization is also a source of a certain level of job satisfaction, personal growth, self-actualisation and a feeling of labour and income security or, of course, the opposite. The interaction between input and output on the human level is, therefore, much more complicated than in the case of other produc-

tion factors. The efficient application of human resources in the production process is no easy task, but a very important one in the present situation of rampant infla= tion and wastage must be kept to a minimum also in this sphere. Bass maintains that absenteeism, accidents, avoidable labour turnover and conflict situations such as strikes, are symptoms of wastage in the human field.

Apart from the main aim of production, every organization has the secondary aim of the maintenance of the organization. *All organizations have to make provision for continuing activities directed towards the achievements of aims* (Payne and Pugh 1976: 1129). Just like machines, the labour force of the organization needs main= tenance. The maintenance process which is aimed at the survival of the organization includes more than just the replacement of men or machines. In this regard Adams (1976: 1175) says: *A condition for organizational survival is effective interaction with the external environment of the organization.* This external environment is not static but is continually changing. Goethe once said that life belongs to the living and that he who wants to live must be ready for changes. This statement can also be applied to organizations. Graen (1976: 1208) states that, *as Bennis (1966) has pointed out, survival of organizations in the future will depend upon their abili= ty to cope and adapt to meet the changing demands of their environments.* This en= vironment is highly dynamic and Beckhard (1969), calling the sixties the decade of explosion, has pointed out certain areas in which *explosions* occured.

(a) The knowledge explosion

More technological knowledge has been generated in the sixties than in the rest of human history.

(b) The technological explosion

The technological knowledge of scientists is usually outdated ten years after graduation.

(c) The communication explosion

This needs no further elaboration.

If the sixties have been called the decade of explosion, one wonders how the eighties will be described. This fast changing environment places much more stress on management and makes planning absolutely necessary. The basic philosophy in this case is that a rational assessment of the possible future increases the efficiency with which production factors can be used. This underlines the fact that all planning is directed towards the future and aimed at making it less unsure. Bennis (1974: 4) says in this regard that *controlling the anticipated future is in addition a social invention that legitimizes the process of future planning. There is no other way I know of to resist the tyranny of blind forces than by looking facts in the face (as we experience them in the present) and extrapolating to the future...*

This, however, reminds one of the words of Robert Burns: *The best laid plans of mice and man...*

In most organizations the planning with regard to money and materials leaves little to be desired, but the same cannot be said of the third M, namely *men*. To quote Ginsberg: *There is still a very wide gap between the experience of most corporations when it comes to financial planning, inventory planning, marketing planning, facilities planning and this new baby called manpower planning* (Killian 1976). Bartlett (1973) also points out that systematic manpower planning in the UK is sadly lacking. This is also the case in the RSA. During manpower surveys in the manufacturing sector in decentralized growth points (Boshoff 1974(a), 1974(b); Herbst en Welthagen 1976), employers were asked to give an indication of the demand for manpower during the next five years. In not a single instance were answers based on any systematic assessment of manpower requirements.

It still remains a fact, however, that *companies which plan, tend to consistently out-perform non-planners* (Van Veijeren 1979: 1). It is also a fact that the larger companies in the RSA are beginning to realize that planning is a necessity.

1.2 AIM OF THE RESEARCH

The following statements logically follow on the preceding paragraph:

(a) Manpower is a very important resource for any organization.
(b) Manpower planning is necessary for the survival of organizations.
(c) The external environment, and therefore also the manpower environment, has an important influence on the performance of organizations.

This study is aimed at (c). It is relatively easy for an organization to obtain information about its own manpower situation if some information system is available. A picture of the external manpower situation, however, is not so easy to obtain. The aim of this study is to present a picture of the macro manpower of the RSA which is as integrated as available information allows it to be.

1.3 METHOD

In this study the main aim is to present an overview of the manpower situation so that an organization can get an indication of the manpower milieu in which it operates. No field survey has been undertaken and use has been made of available information only. The method, which entails the manipulation and integration of existing information, is explained in the text.

Before presenting this picture, however, it is necessary to show where macro manpower information would fit into the manpower planning system of an organization.

CHAPTER 2
MANPOWER PLANNING AT ORGANIZATIONAL LEVEL

2.1 INTRODUCTION

To date the terms manpower and manpower planning have been used without giving any definitions. Because these terms are generally used, some definitions would be appropriate.

2.1.1 *Manpower*

The term manpower was used widely during the Second World War (Patten 1971) and is in a sense a vogue word. At national level, manpower is often used as a synonym for labour force, that is to say the total number of people working or willing to work, in other words the economically active population. At the level of the organization, manpower is often used to describe the number of workers in the organi= zation. It is very difficult to give any precise definition that will include all the general uses. Various meanings of the word are pointed out by Patten (1971: 12): *other possible contemporary meanings of the term manpower include the following: Manpower can be equated with the labour force. Manpower can be considered tantamount to human capital.*

Burack (1972: 35) suggests that each organization should define manpower in terms of the variables (numbers, skills, occupations, etc.) used by the organization in its planning operation. Megginson (1977) with his tongue in his cheek says that he uses the term with various meanings because he does not want to bore the reader, but maybe his approach is not wrong. As is the case with the word *work*, which also defies definition, most readers will know what is meant without a given definition that can withstand scientific scrutiny. In this report, manpower is usually used for the human input into the production process.

2.1.2 *Manpower planning*

No level of knowledge or sophistication in the manipulation of data can change the fact that all knowledge has bearing on past situations and that all decisions of the present will have an effect only in the future. As has been pointed out in Paragraph 1.1, planning is directed towards the future and is an attempt to make the future less unsure. A very popular definition of manpower planning and one that is quoted frequently, is that of Vetter: *Manpower planning is striving to have the right number of the right people at the right time doing things which result in organization and the individual receiving maximum long-run benefits* (Burack 1972: 58). This definition is somewhat vague but covers more ground than those definitions that stress the forecasting aspects of the planning process. An example of the latter is supplied by McBeath (1978: 5): *It is the task of manpower*

planning to determine and specify the optimum requirements now and in the forecastable future. In this definition no attention is given to aspects such as the motivation of people. The general trend seems to be to prefer definitions that include more than just the forecasting of future demand and supply situations.

2.2 A MANPOWER PLANNING MODEL

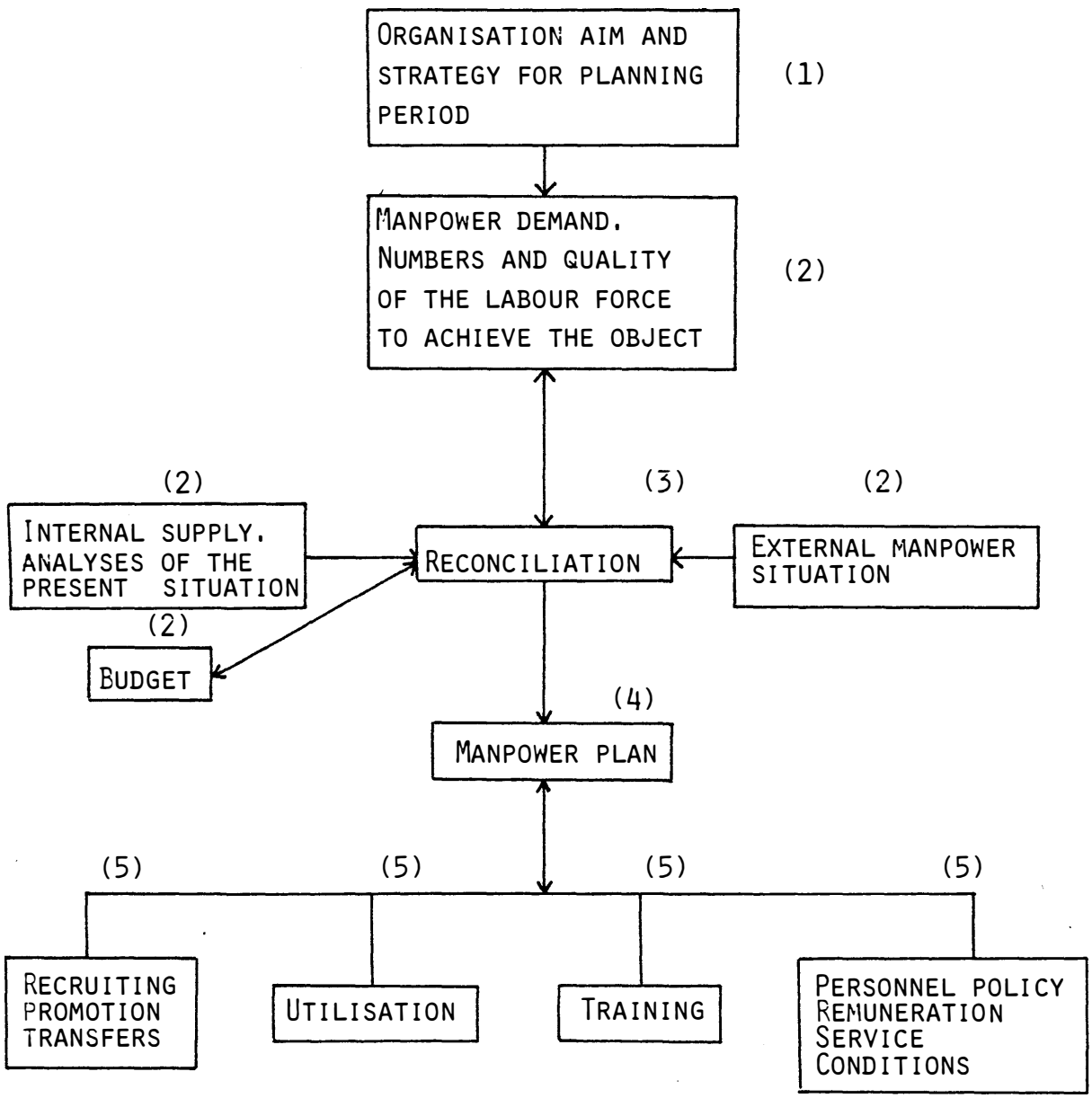
Whatever definition is used for manpower planning, experts seem to agree that manpower planning can only succeed when it has the full backing of top management and becomes part and parcel of the financial and other planning activities of the organization. It is also important to recognize that manpower planning does not lead to a manpower plan which is an unchangeable blueprint for action. Manpower planning must be seen as a process which needs continual revision. This process starts with the formulation of the general aims of the management of the organization. As Burack (1972: 59) puts it: *The key step in the process is initiated with manpower forecasts tied to organizational goals*. Manpower planning should logically form part of the personnel function of the organization because the personnel department is best equipped to generate the data input in the planning process.

During a manpower planning seminar in 1979 at the UNISA Business School, Hofmeyer (1979) supplied a manpower planning model shown in Figure 1. This model contains most of the elements of the planning process as it is found in the literature (for example Burack 1972; Megginson 1977; Patten 1971; Timperley 1974; Pettman and Tavernier 1976).

The first step in the process is to convert the organizational goals (1 in the figure) into manpower needs (2). Is the organization going to grow? Is there going to be a change in technology? If technology is going to change, how will it affect skills and what will the effect be? This conversion of organizational goals into manpower needs is done in consultation with the experts in the various sections of the organization. The next step is to determine the internal supply, in other words to estimate how many people with the necessary skills the organization can supply from its own sources for the planning period. In the larger firms this pre-supposes a personnel information system which can deliver data on skills, retirements, labour turnover and promotability. Literature on information systems is plentiful (for example Sayles and Strauss 1977; Bell 1974). Several of the computer companies supply computer packages in this regard or are available for consultation. Needs and the estimates of supply are now compared. From this comparison a target can be set for recruitment and training. The target must, however, be reconciled with the budget and this reconciliation is the result of internal consultation and negotiation and a commitment of active support from all concerned (3 in the figure). The manpower plan is aimed at obtaining balance between needs and supply. Because no organization operates in a vacuum, no sensible or realistic reconciliation or

FIGURE 1

A SCHEMATIC MODEL FOR MANPOWER PLANNING



supportive actions (5 in the figure) are possible without taking the external manpower situation into account.

It is relatively easy for any organization, depending on the importance allocated to it by management, to gather and order information on its own manpower situation. Knowledge of the external situation is not so easily available. This brings us to the main aim of this study, namely the construction of a macro manpower picture through which the planner can increase his knowledge of the external situation. One must immediately point out that it is highly unlikely that the information contained in this report can dovetail in any numerical way with the planning of organization. Mr U.B. Schijf, Personnel Manager (Manpower) of Anglo American, says *the point must be stressed that care must be taken that planning is not used as an excuse for meticulous search for certainty. Uncertainty and risk is what business is all about. Planning does not mean to predict and control exactly what is going to happen in the future. It means no more than having a clear idea of where one wants to go, what may stop one from getting there and recognising what kind of choice and compromise may be needed to achieve one's ends* (Schijf 1979: 22). The aim of the macro picture developed in this study is to give the organization a clearer idea of the options open to it.

After the external situation has been taken into account the manpower plan is decided upon. This plan has several components (5) which speak for themselves and cannot be divided into watertight compartments. The whole model forms an inter=related whole which must be continuously adapted to suit changing circumstances.

The place and role of the external manpower situation in the manpower planning process have been indicated. Because planning is directed towards the future, any manpower picture must contain some indication of future developments. In this study the programming period of the Economic Development Programme (1978-1987) is chosen as the time span for this study.

The macro picture in this study consists of

(a) the size, growth and population group structure of the supply of manpower up to 1987;

(b) the demand for manpower by population, occupational and sex group for the period 1978 to 1987, and

(c) the demand and supply situation in certain occupations which can be re=garded as key occupations for economic growth.

CHAPTER 3

THE SUPPLY OF MANPOWER IN 1987

3.1 INTRODUCTION

The size of the labour force of a country is a function of the size of the population. Depending on, inter alia, the culture, age and wage structures, the retention capacity of the school system, labour legislation and the number of available jobs, a certain percentage of the population will be willing to work or to accept work. The specific percentage in an age group which is economically active (the activity rate) depends on the interaction of the above mentioned and other factors. An estimate of the size of the labour force at a certain time thus means that estimates of the population as well as activity rates must be made.

Depending on the assumptions about fertility and mortality as well as emigration, different population projections are possible. As is the case with population projections, different estimates of the size of labour force is possible, depending on the set of assumptions that forms the basis of the estimates. Sources on which to base the assumptions are very limited. For Whites and Asians we have only the population census. For Blacks and Coloureds the Current Population Survey (CPS) gives some additional information. The CPS is undertaken on a national sample basis. Estimates of activity rates in the RSA are also complicated by the heterogeneity of the population and the diversity within a population group. With the limited sources it is impossible to take separate account of the various factors mentioned previously. Basically one has to rely on two fixed points, namely the information supplied by the 1960 and 1970 population censuses. Any mathematical function can be fitted to two points so that any projection is possible and any estimate would be somewhat arbitrary. Existing estimates can, also because of different sets of assumptions, not be integrated in one logical whole. The aim of the estimate of supply is to show what the targets for the creation of jobs should be. Even if the estimates presented in this study differ from others, it is highly unlikely that the basic picture will be concealed or distorted. In this estimate of the size of the labour force, population projections of the HSRC are used. The population projections include the populations of the Transkei, Bophuthatswana and Venda.

3.2 ESTIMATING ACTIVITY RATES

Because the age structure of the population is changing over time and activity rates for the various age groups differ markedly, age must be taken into consideration when estimating future activity rates. The population census is the only source from which activity rates for Whites and Asians can be estimated. The Current Population Survey (CPS) supplies additional information for Blacks and Coloureds, therefore the method of estimating the activity rates for the two groups is different.

3.2.1 *Activity rates for Whites and Asians*

In the HSRC report *Die vraag na en aanbod van mannekrag in 1981*: Deel II, (Vermaak et al, 1978) activity rates for the population were calculated for 1981. The method and assumptions are explained in their report and will not be repeated in detail here. In short, activity rates were calculated by a rectilinear extrapolation of the change observed between 1960 and 1970. Each extrapolation was then compared, age group for age group, with activity rates of a number of overseas countries. If the extrapolation deviated markedly and could not be explained, the activity rates were adapted. Table 3.1 shows the basis on which the activity rates for 1981 were calculated.

TABLE 3.1

PROJECTION METHODS OF ACTIVITY RATES FOR WHITES AND ASIANS FOR 1981

Age group	Whites		Asians	
	Male	Female	Male	Female
15-19	Rectilinear	Rectilinear	½ Recti= linear *	Rectilinear
20-24	"	"	"	"
25-29	"	"	"	"
30-34	"	"	"	"
35-39	"	"	"	"
40-44	"	"	"	"
45-49	"	"	"	"
50-54	"	"	"	1970**
55-59	"	"	"	1970
60-64	"	"	"	1970
65-69	"	"	"	1970
70-74	"	"	"	1970

* half-rectilinear means that the change projected by rectilinear extrapolation is halved.

** The activity rate for 1970 has been retained unchanged.

In the estimates of the activity rates for 1987 it was assumed that the changes could not continue rectilinearly or even half-rectilinearly, but would tend to become smaller. The function $y = a + b \log x$ is therefore used for extrapolation with the 1970 and calculated activity rate of 1981 as basic data. Because the 1960 and 1970 activity rates differ so much for Asian males, it is assumed that no further changes will occur after 1981, so the 1981 figures are used for 1987. The activity rates for 1977 were calculated in the same way.

The method used illustrates the arbitrariness mentioned previously. When the information of the 1980-population census becomes available, a new set of activity rates could be calculated.

Table 3.2 shows the estimated activity rates for Whites and Asians and Figure 2 presents the data graphically.

3.2.2 *Activity rates for Blacks and Coloureds*

The CPS of the Department of Statistics is conducted on a monthly basis on samples (12 000 Coloured and 45 000 Blacks). These surveys are aimed mainly at the determination of unemployment, but activity rates can be calculated from the data. The classification system used in the 1970-population census for workers in the agricultural sector resulted in very high activity rates, especially for Black women. The CPS is therefore perhaps the best source to use, and it is assumed that the average activity rate for 1979 would also apply for 1987. The CPS is not conducted in the independent Black states, although the population estimates do include them. The true activity rates for these states would perhaps, because of their more rural character, be lower than those shown in Table 3.3 for 1987.

3.3 THE SIZE OF THE LABOUR FORCE

The size of the labour force in 1977 and 1987 is calculated by applying the activity rate for each age and population group to the relevant population estimate. The results by race and sex appear in Table 3.4. Van Tonder (1980) gives a high and a low estimate of the population, but these two estimates differ only slightly up to 1987 and the low estimate of the population is used.

The activity rates for men used in the calculation of the labour force show a general tendency to become smaller. Those for females show a rising tendency, but all are well within the limits found in many overseas countries. It is therefore highly unlikely that the size of the labour force is overestimated.

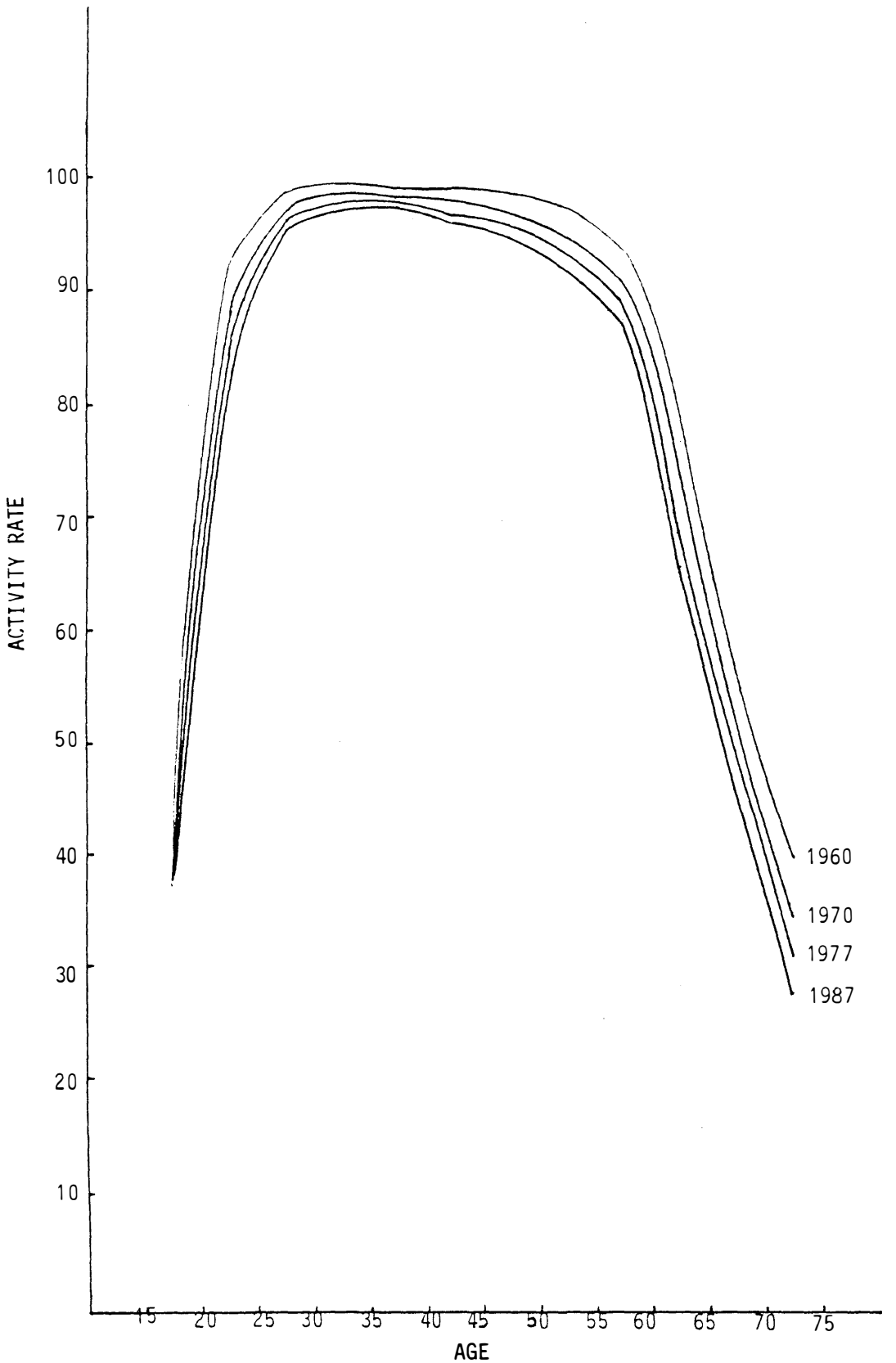
The growth in the labour force is indicative of the job opportunities that must be created for the period 1978-1987. The White labour force must be decreased by about 50 000 males to compensate for national servicemen who are not regarded as economically active.

TABLE 3.2

ACTIVITY RATES FOR WHITES AND ASIANS ACCORDING TO AGE AND SEX, 1960, 1970 AND 1977, 1987

Age group	White males				White females				Asian males				Asian females			
	1960	1970	1977	1987	1960	1970	1977	1987	1960	1970	1977	1987	1960	1970	1977	1987
15-19	37,01	37,61	38,03	38,41	33,08	33,23	33,33	33,42	50,80	44,30	42,02	40,72	6,90	19,70	28,66	36,83
20-24	91,56	88,15	85,77	83,59	50,49	58,11	63,44	68,30	91,80	86,30	84,37	83,27	10,00	25,10	35,67	45,30
25-29	98,68	97,33	96,38	95,52	31,03	39,60	45,60	51,07	99,10	94,10	92,35	91,35	10,10	20,10	27,10	33,48
30-34	99,37	98,55	97,98	97,46	28,29	35,58	40,69	45,34	99,50	96,00	94,77	94,07	7,00	18,20	26,04	33,19
35-39	99,17	98,52	98,06	97,64	28,66	37,19	43,16	48,60	99,20	96,30	95,28	94,70	8,70	16,80	22,47	27,64
40-44	99,18	97,83	96,88	96,02	28,52	39,35	46,93	53,84	99,30	95,30	93,90	93,10	9,80	16,40	21,02	25,23
45-49	98,78	97,20	96,09	95,08	28,75	37,74	44,04	49,77	99,30	94,20	92,41	91,39	9,90	12,10	13,64	15,04
50-54	97,82	95,08	93,16	91,42	26,41	33,50	38,47	42,99	95,90	89,40	87,12	85,82	12,60	10,20	10,20	10,20
55-59	94,00	91,27	89,36	87,62	25,20	28,19	30,29	32,19	94,30	84,70	81,34	79,42	11,90	8,00	8,00	8,00
60-64	77,10	72,28	68,91	65,83	14,82	18,70	21,42	23,89	78,10	65,30	60,82	58,26	7,40	5,30	5,30	5,30
65-69	58,78	53,76	50,25	47,05	7,89	11,02	13,21	15,20	44,40	41,80	40,89	40,37	2,80	1,50	1,50	1,50
70-74	39,97	34,69	30,99	27,62	4,74	5,50	6,03	6,52	24,00	27,70	28,99	29,73	1,50	0,70	0,70	0,70
TOTAL	85,29	83,12	82,08	81,21	29,18	35,52	39,70	43,77	85,75	80,42	79,56	78,92	8,80	18,03	23,84	28,18

ACTIVITY RATES FOR WHITE MALES



ACTIVITY RATES FOR WHITE FEMALES

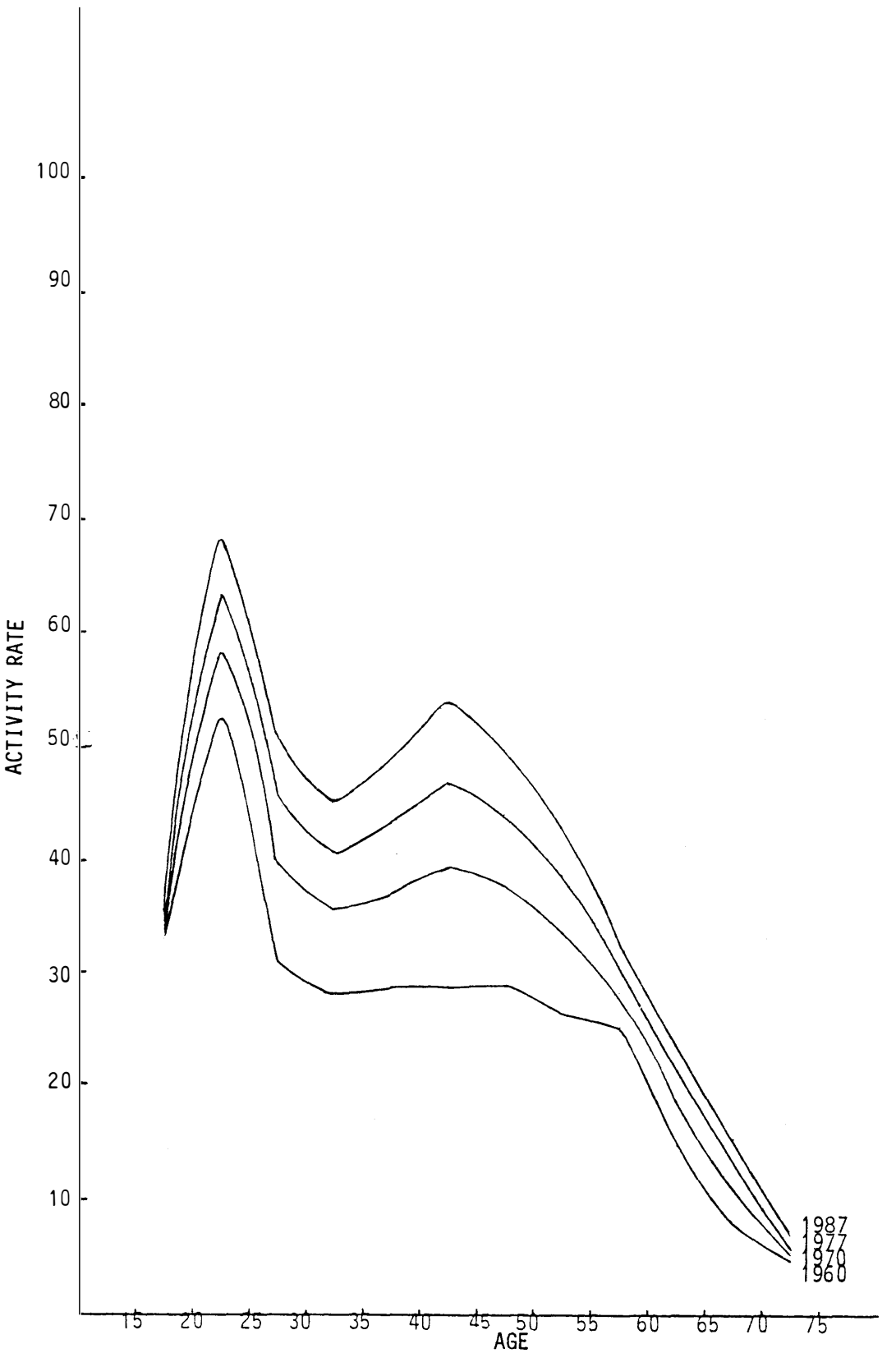


FIGURE 2(c)

ACTIVITY RATES FOR ASIAN MALES

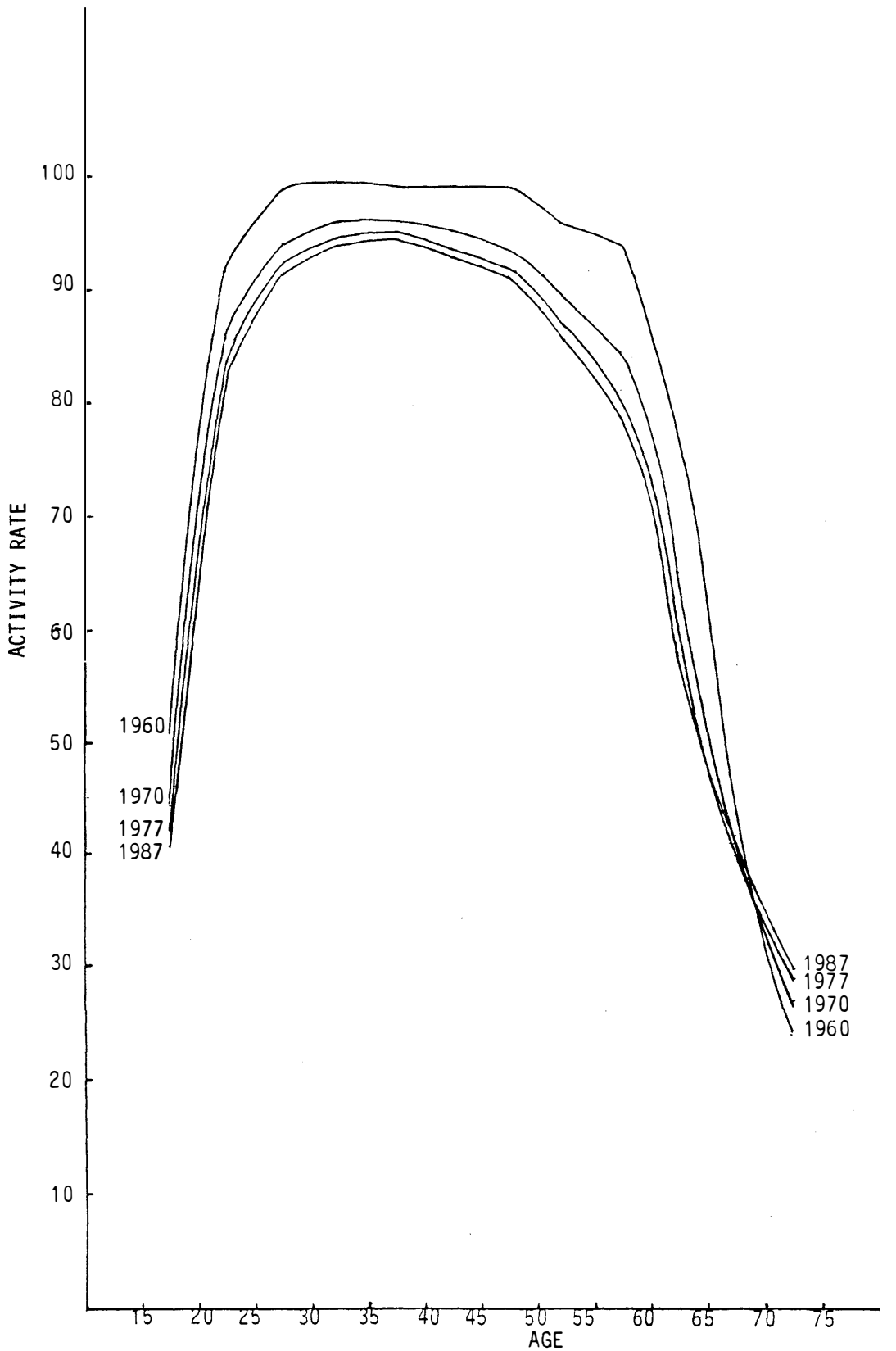


FIGURE 2(d)

ACTIVITY RATES FOR ASIAN FEMALES

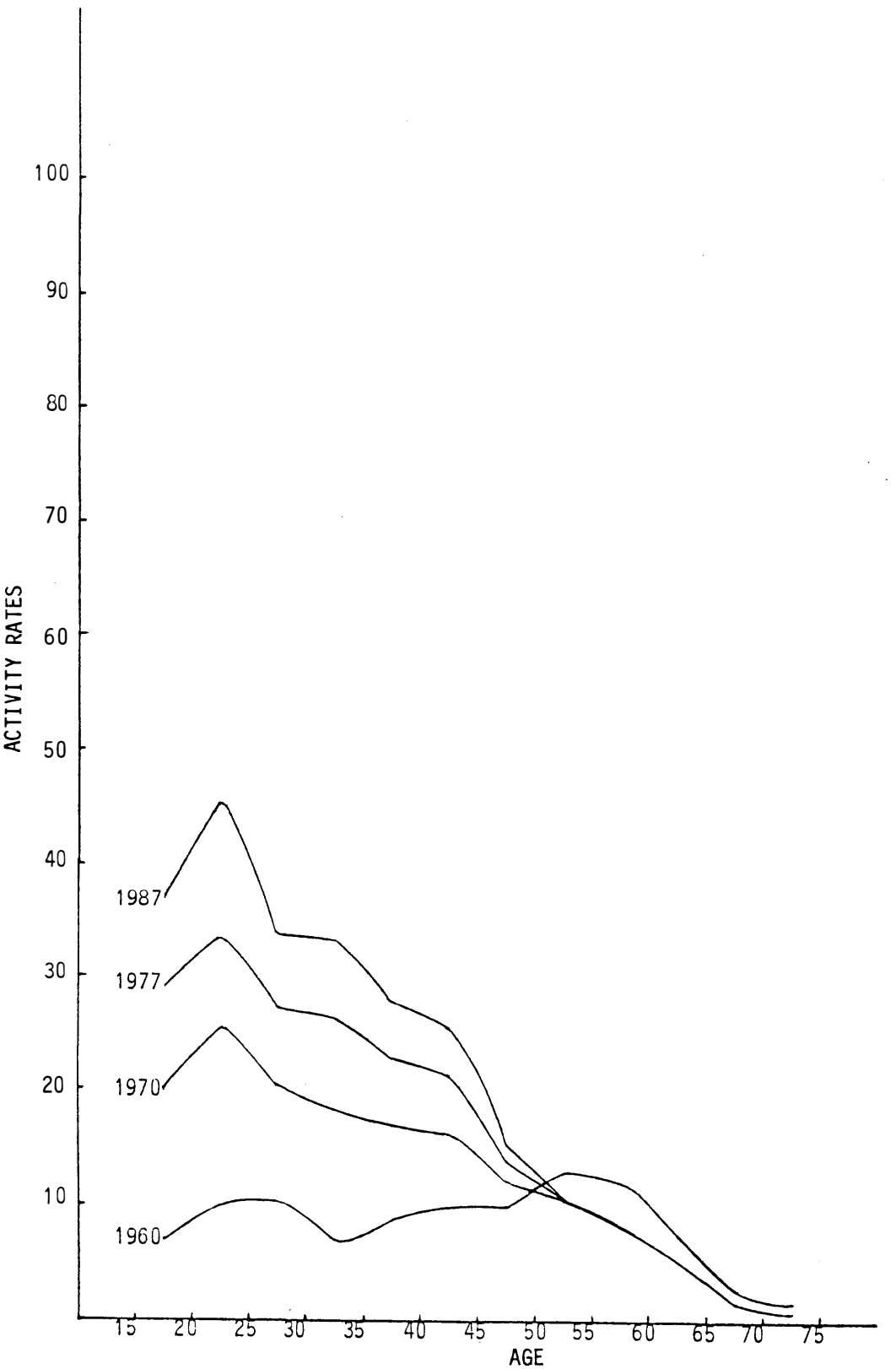


TABLE 3.3

ACTIVITY RATES FOR COLOUREDS AND BLACKS ACCORDING TO AGE AND SEX, 1977, 1987

Age group	Coloureds				Blacks			
	Males		Females		Males		Females	
	1977	1987	1977	1987	1977	1987	1977	1987
15 - 19	41,97	41,97	37,41	37,41	27,79	27,79	16,51	16,51
20 - 24	90,51	90,51	70,48	70,48	78,29	78,29	39,74	39,74
25 - 29	94,32	94,32	59,44	59,44	90,22	90,22	47,95	47,95
30 - 34	93,17	93,17	56,71	56,71	91,46	91,46	50,60	50,60
35 - 39	92,59	92,59	50,50	50,50	92,15	92,15	49,76	49,76
40 - 44	90,43	90,43	46,78	46,78	90,23	90,23	47,88	47,88
45 - 49	89,16	89,16	39,23	39,23	89,27	89,27	46,92	46,92
50 - 54	86,59	86,59	35,68	35,68	86,01	86,01	39,66	39,66
55 - 59	74,78	74,78	29,72	29,72	80,19	80,19	29,99	29,99
60 - 64	55,39	55,39	17,72	17,72	67,54	67,54	18,24	18,24
65 - 69	29,01	29,01	9,93	9,93	65,63	65,63	8,84	8,84
70 - 74	19-68	19,68	5,36	5,36	28,65	28,65	5,53	5,53
TOTAL	77,08	79,15	47,85	48,49	73,22	74,88	36,96	37,71

TABLE 3.4 (a)

ESTIMATE OF THE SIZE OF THE SOUTH AFRICAN ECONOMICALLY ACTIVE POPULATION FOR 1977 AND 1987 BY POPULATION GROUP, AGE AND SEX (MINIMUM ESTIMATE)

Age group	Whites				Coloureds				Asians				Blacks			
	Males		Females		Males		Females		Males		Females		Males		Females	
	1977	1987	1977	1987	1977	1987	1977	1987	1977	1987	1977	1987	1977	1987	1977	1987
15-19	76 577	84 145	64 340	70 874	60 953	67 085	54 821	60 170	17 178	19 765	11 730	17 851	291 684	330 479	173 619	197 658
20-24	158 940	173 524	114 471	137 652	106 729	143 006	83 455	113 353	32 162	35 331	13 622	19 357	670 006	847 411	341 088	434 358
25-29	180 703	188 958	82 121	97 886	88 878	130 775	57 175	84 096	31 713	36 065	9 469	13 338	609 887	900 847	326 587	488 371
30-34	178 304	176 987	69 380	81 072	67 157	103 996	42 895	64 383	26 990	34 411	7 596	12 270	522 054	737 716	291 911	418 007
35-39	150 836	178 828	62 396	86 484	56 258	81 905	32 133	46 278	21 790	31 024	5 256	9 298	442 504	581 927	242 580	324 186
40-44	121 139	169 542	56 405	90 317	48 271	60 425	26 463	33 457	16 902	25 035	3 964	7 037	367 056	474 520	199 420	262 287
45-49	104 680	140 034	47 726	70 235	37 492	49 172	17 869	23 342	13 233	19 384	2 057	3 328	302 179	386 718	164 971	214 847
50-54	93 616	106 998	39 232	49 795	28 834	40 715	12 342	18 539	10 106	13 937	1 221	1 789	233 861	305 938	114 459	152 453
55-59	77 618	86 078	27 673	32 940	19 413	26 465	7 956	12 069	7 337	9 832	740	1 091	168 479	226 537	68 977	94 528
60-64	51 255	56 232	17 517	22 249	10 784	14 451	3 707	5 204	4 124	5 465	364	548	102 526	142 712	31 573	44 962
65-69	31 120	32 135	9 514	12 040	4 230	5 335	1 594	2 065	1 865	2 672	67	111	68 190	95 951	11 076	16 000
70-74	12 191	14 175	3 097	4 198	1 944	2 222	638	768	704	1 246	16	33	21 201	25 527	5 143	6 570
TOTAL	1236 979	1407 636	593 872	755 742	530 943	725 552	341 048	463 724	184 104	234 167	56 102	86 051	3799 627	5056 283	1971 404	2654 227
TOTAL M + F 1977	1830 851 (1780 851)[1]				871 991				240 206				5771 031			
1987	2163 378 (2113 378)				1189 276				320 218				7710 510			
Total labour force 1977	8714 079 (8664 079)															
1987	11383 382 (11333 382)															

[1] Figures between brackets represent the labour force when White males doing national service are subtracted.

TABLE 3.4(b)

GROWTH IN THE ECONOMICALLY ACTIVE POPULATION

Age group	Whites				Coloureds				Asian				Blacks			
	Males		Females		Males		Females		Males		Females		Males		Females	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
15-19	0,85	0,95	0,94	0,97	0,96	0,96	0,93	0,93	1,73	1,41	1,70	4,29	1,26	1,26	1,30	1,30
20-24	1,14	0,88	1,11	1,86	2,97	2,97	3,11	3,11	1,08	0,94	1,13	3,58	2,38	2,38	2,45	2,45
25-29	0,54	0,45	0,62	1,77	3,94	3,94	3,93	3,93	1,40	1,29	1,32	3,48	3,98	3,98	4,11	4,11
30-34	-0,02	-0,07	0,48	1,57	4,47	4,47	4,14	4,14	2,53	2,46	2,40	4,91	3,52	3,52	3,66	3,66
35-39	1,76	1,72	2,10	3,32	3,83	3,83	3,71	3,71	3,66	3,60	3,70	5,87	2,78	2,78	2,94	2,94
40-44	3,51	3,42	3,39	4,82	2,27	2,27	2,37	2,37	4,09	4,01	3,99	5,91	2,60	2,60	2,78	2,78
45-49	3,06	2,95	2,68	3,94	2,75	2,75	2,71	2,71	4,01	3,89	3,91	4,93	2,50	2,50	2,68	2,68
50-54	1,54	1,34	1,28	2,41	3,51	3,51	4,15	4,15	3,45	3,27	3,89	3,89	2,72	2,72	2,91	2,91
55-59	1,24	1,04	1,14	1,76	3,15	3,15	4,25	4,25	3,42	2,97	3,96	3,96	3,00	3,00	3,20	3,20
60-64	1,39	0,93	1,31	2,42	2,97	2,97	3,45	3,45	3,30	2,85	4,19	4,18	3,36	3,36	3,60	3,60
65-69	0,98	0,32	0,96	2,38	2,35	2,35	2,63	2,62	3,80	3,66	5,25	5,18	3,47	3,47	3,75	3,75
70-74	2,69	1,52	2,29	3,09	1,34	1,34	1,87	1,87	5,60	5,87	7,78	7,51	1,87	1,87	2,48	2,48
TOTAL	1,41	1,30	1,44	2,44	2,90	3,17	2,98	3,12	2,52	2,43	2,64	4,37	2,67	2,90	2,81	3,02

A= Growth in population.

B= Growth in labour force.

According to Table 3.4(a) the economically active population will increase from 8 714 000 in 1977 to 11 383 000 in 1987, an increase of 2 669 000 in 10 years or roughly 267 000 per annum. This means that 730 job opportunities must be created each day of this period.

Fluctuations can be attributed to variations in the birth rate but, and this is more important, not to variations in the net immigration gain.

The activity rate calculated from the CPS for Blacks and Coloured males is markedly lower than the 1970 rate (figure 3a and 3b). In spite of this lower activity rate, the population group structure of the economically active population changes in accordance with the changes observed in the population size.

The White component of the labour force decreases from 21% in 1977 to an estimated 19% in 1987 in spite of the higher activity rate for White women. The higher percentage of Whites in the labour force relative to the population, must be attributed to higher activity rates and the youthfulness of the Non-White population of whom nearly 50% are younger than 15 years of age.

The birth rate for Whites has decreased so much that the growth in labour force in the younger age group is below 1% p.a., and it is expected to decrease even further during the 1990's when even a negative growth rate can be expected.

This situation has very important implications for manpower planning at organization and national level. White workers, especially male workers, are going to become scarcer in the future. This aspect will again be referred to when the demand for labour is analysed in the following chapters.

FIGURE 3(a)
COMPARISON BETWEEN THE 1970 ACTIVITY RATES AND
THE CPS ACTIVITY RATES FOR THE COLOURED
POPULATION ACCORDING TO SEX

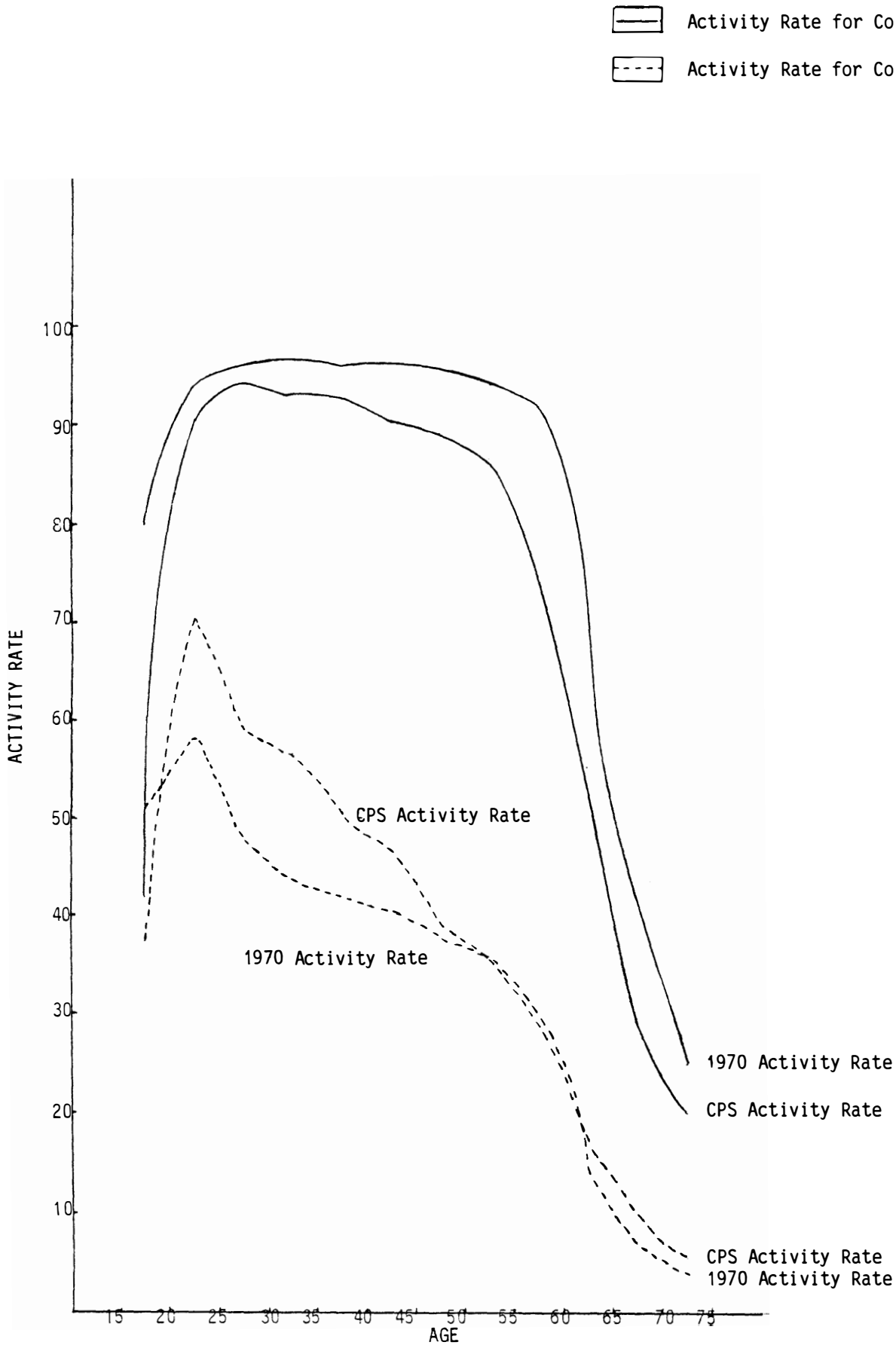
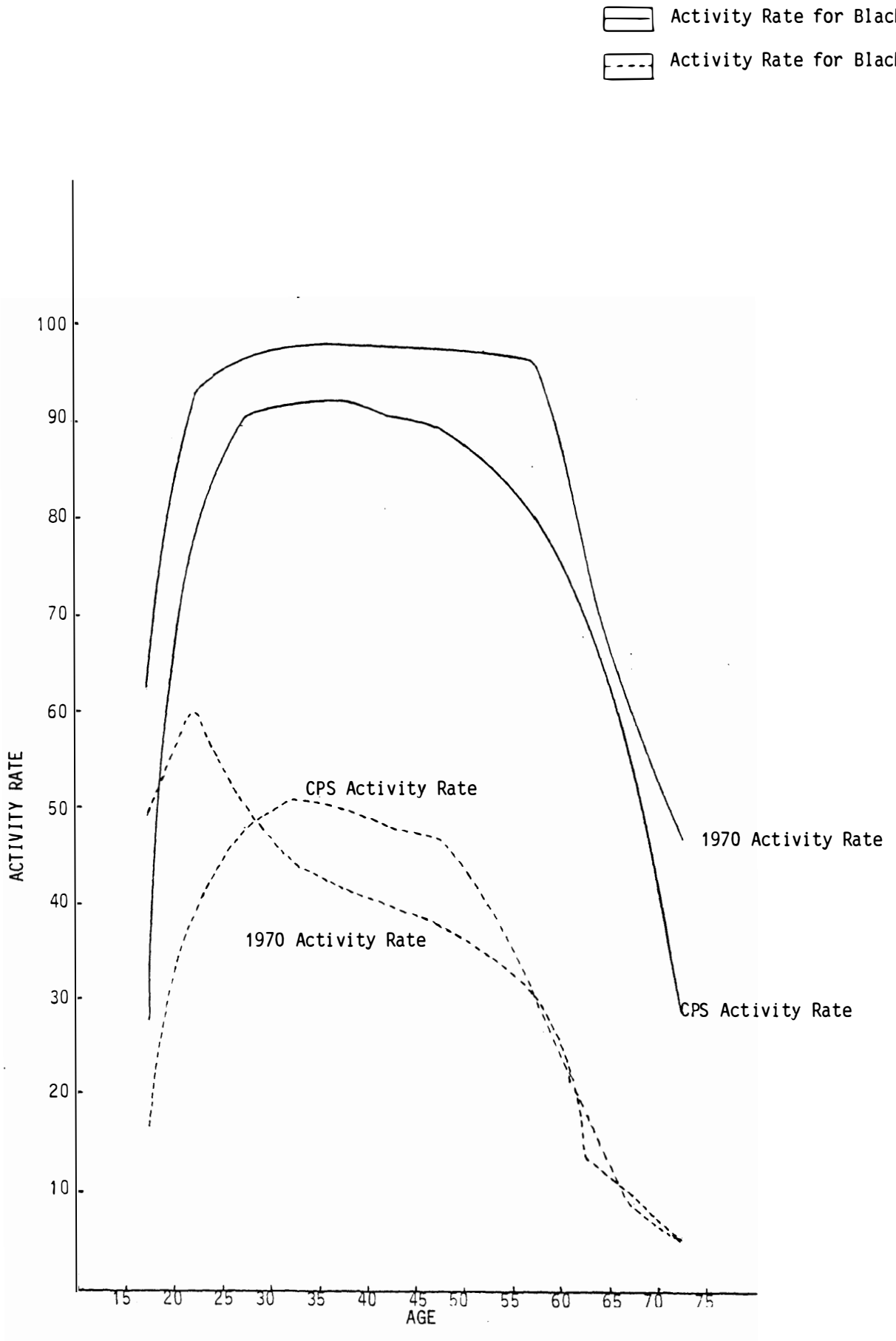


FIGURE 3(b)

COMPARISON BETWEEN THE 1970 ACTIVITY RATES AND THE CPS ACTIVITY RATE FOR THE BLACK POPULATION ACCORDING TO SEX



CHAPTER 4

THE DEMAND FOR MANPOWER AND STRUCTURAL CHANGES IN DEMAND

4.1 INTRODUCTION

The demand for labour is a function of the demand for goods and services as well as the price paid for labour. Given a fixed level of technology, the demand for labour will usually increase as production increases. Estimates of the future demand for labour must therefore be coupled with estimates of the level of economic activity. The level of economic activity is usually expressed in terms of the Gross Domestic Product (GDP), that is the total value produced by the goods and services.

In the Economic Development Programme (EDP) for the RSA a target for economic growth is set. From this target flows a certain estimate of the demand for labour. In the latest GDP (1978 to 1987) (Office of the Economic Adviser 1980), three scenarios of economic growth are presented and analyzed. The conclusion reached is that an annual growth of 4,5 % in the GDP could be a possible target. Although it would place stress on certain production factors, this rate is chosen because it is expected that unemployment would then remain within manageable bounds. It is estimated that job opportunities will increase from 5 354 000 in 1977 to 7 005 000 in 1987 (domestic servants and agricultural workers excluded). This demand for labour divided into 28 sectors, is taken as point of departure for the estimates of demand by occupational groups. The occupational structure of the labour force broadly illustrates the skill mix present in the labour force for the production of goods and services.

4.2 CHANGES IN THE OCCUPATIONAL STRUCTURE, 1977 TO 1987

The occupational structure of the labour force changes over time not only because of technological changes in the production process, but also because the demand for specific goods and services changes as the general income level of the population increases, or even because of certain fads and fancies.

The bi-ennial manpower surveys of the Department of Manpower for the period 1965 to 1979 are used as the basic sources of information on which the estimates of occupational structures and changes in manpower are based. The labour force is divided (domestic servants and agricultural workers excluded) into 28 economic sectors and 22 occupational groups.

The percentages for the various occupational groups in a sector vary considerably from survey to survey. It is known that changes in the occupational structure occur only slowly and that large variations must be ascribed to sample variations and classification problems. To remove large variations in the data, a kind of moving

average is used. The method can best be explained by using an example. The information used in the example is the occupational group "production workers" in the sector "other mining".

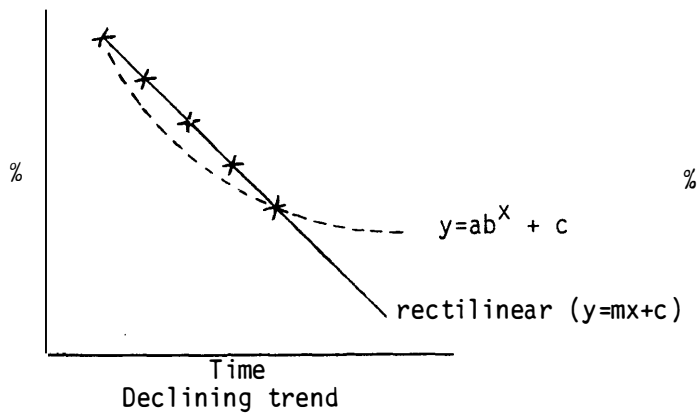
Basic information % production workers in "other mining"		Average for midyears	Calculated % for midyears used to calculate % for basic years. Time series used in extrapolation.
1965	62,77		62,77
1966		57,04	57,04
1967	51,31		56,52
1968		56,01	56,01
1969	60,71		59,45
1970		62,89	62,89
1971	65,07		65,84
1972		68,80	68,80
1973	72,53		66,49
1974		64,17	64,17
1975	55,82		63,23
1976		62,28	62,28
1977	68,75		63,88
1978		65,48	65,48
1979	62,20		62,20

The calculations result in a time series with 15 points in time for each occupation in each sector. A modified exponential curve ($y = ab^x + c$) is now fitted to the series by the ordinary least squares method and projected to 1987. Tables 1 to 28 in the appendix show the basic, unchanged percentages for the period 1965 to 1979. The projected structure (column heading "target year" in the Tables) seldom adds to precisely 100 % and this is either increased or decreased, *pro rata*, to 100 %. The calculated percentages are now used to calculate the job opportunities in each sector in each of the occupational groups. The sectorial approach is used because each sector has its own special occupational structure and specific rate of growth.

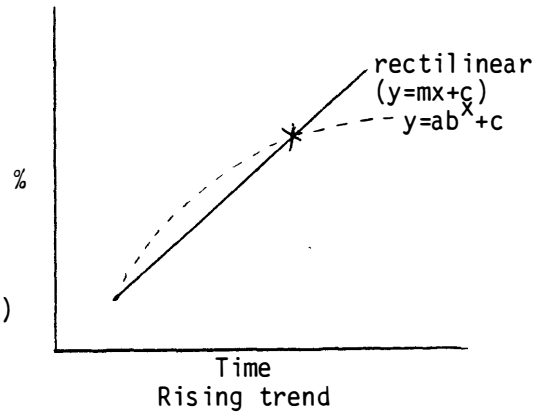
To find the total demand by occupational group each occupational group is summed over all the sectors.

It is acknowledged that the demand for labour is colour-blind and that sex should also be disregarded. But to increase understanding of the dynamics of the labour market and because it is well-known that the population groups and the sexes within each group have quite different occupational structures, the demand is broken down into population group and sex, again based on the assumption that past trends

will continue. The population group and sex composition are calculated in exactly the same way as the occupational structure. By using the function $y = ab^x + c$, all trends are conservatively projected because of the "flattening" properties of the function which is explained in the sketches below.



Declining trend



Rising trend

The results of the calculations appear in Tables 4.1 for population group and 4.2 for population group by sex. Table 4.3a show the effect of the extrapolation by comparing the situation in 1977 with the extrapolated situation in 1987 and Table 4.3b gives the annual growth rate in demand for the period 1977 to 1987.

Figure 4 illustrates the data in Table 4.3, but the first 13 occupational groups are collapsed into one group, namely professional, semiprofessional and technical workers.

The data in the appendix are not discussed in any detail because each sector has its own special occupational structure and the individual organization can compare its situation with the general one.

The worth and use of the sectorial tables will be explained by using a single example. Table 2.7 of the appendix shows that clerical personnel play a very important role in the sector "Diverse Services and Financing" and more than 25 % of the job opportunities fall in this category.

Table 4.1 indicates that the number of Whites in clerical occupations are decreasing rapidly while the percentage of Non-Whites are increasing. A glance at Table 4.2(a) shows that the percentage of White male clerks is also decreasing rapidly. These trends have important implications for the banks and building societies which form part of this sector. These employer groups traditionally employ quite a number of Standard Ten school leavers, who then receive in-service training. With a system of inhouse promotions, many of the managerial positions are eventually filled from this area. In the past these managers were mainly male and White.

TABLE 4.1

POPULATION GROUP STUCTURE BY CCCUPATICNAL GRCUP IN 1965-1979
AND THE PROJECTED DISTRIBUTION IN THE YEAR 1987

C C C U P A T I C N	GROUP	B A S E P E R I C D								TARGET YEAR : 1987	
		1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	WHITE	99.06	100.00	99.84	99.63	99.61	98.86	96.09	95.83	95.33	6859
	COLOURED	0.0	0.0	0.0	0.18	0.31	0.66	3.19	3.11	3.56	256
	ASIAN	0.34	0.0	0.16	0.18	0.08	0.17	0.23	0.92	0.66	48
	BLACK	0.0	0.0	0.0	0.0	0.0	0.29	0.49	0.14	0.44	32
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	7195
2 ENGINEERS, ETC.	WHITE	99.97	99.82	99.91	99.22	99.69	99.71	99.67	99.29	99.35	21859
	COLOURED	0.02	0.0	0.0	0.02	0.10	0.11	0.09	0.28	0.26	57
	ASIAN	0.01	0.17	0.09	0.72	0.20	0.11	0.20	0.39	0.32	71
	BLACK	0.0	0.01	0.0	0.03	0.01	0.07	0.04	0.05	0.07	14
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	22001
3 SURVEYORS	WHITE	99.57	99.63	99.46	98.80	94.56	90.62	89.39	89.46	84.49	4055
	COLOURED	0.0	0.0	0.0	0.16	0.21	0.03	0.42	8.00	5.08	244
	ASIAN	0.0	0.0	0.0	0.05	0.07	0.07	0.42	0.67	0.63	30
	BLACK	0.43	0.37	0.54	0.99	5.16	9.28	9.77	1.87	9.80	470
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	4799
4 NATURAL SCIENTISTS	WHITE	92.67	98.91	96.85	95.91	89.94	91.11	95.63	91.88	91.23	13241
	COLOURED	0.25	0.11	0.24	0.34	0.28	2.25	0.95	1.24	1.88	273
	ASIAN	0.10	0.09	0.08	0.46	0.94	1.37	1.32	1.08	1.69	245
	BLACK	6.98	0.88	2.83	3.29	8.85	5.26	2.09	5.80	5.20	755
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	14514
5 MEDICAL DOCTORS, ETC.	WHITE	97.64	97.38	96.78	94.23	93.52	93.20	92.23	92.56	90.81	18774
	COLOURED	0.33	0.31	0.59	0.97	1.02	1.13	1.35	1.63	1.84	380
	ASIAN	1.38	1.71	1.93	4.28	4.60	4.93	5.30	5.21	6.41	1321
	BLACK	0.65	0.60	0.69	0.52	0.87	0.74	1.12	0.59	0.94	194
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	20619
6 NURSES AND MIDWIVES	WHITE	55.06	51.30	50.67	44.18	44.03	41.53	41.33	44.09	39.34	47798
	COLOURED	10.07	6.18	7.47	7.51	8.85	9.31	10.21	14.63	13.34	16211
	ASIAN	0.88	1.07	0.93	2.35	1.05	1.54	1.83	3.80	3.22	3908
	BLACK	33.99	41.45	40.88	45.96	46.07	47.62	46.64	37.47	44.10	53570
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	121487
7 OTHER PARAMEDICAL WORKERS	WHITE	96.37	94.79	92.63	90.72	85.37	86.09	86.40	89.68	84.95	15327
	COLOURED	0.70	0.79	0.75	1.82	6.60	1.73	2.43	2.35	3.25	587
	ASIAN	0.68	1.12	1.37	2.10	1.55	1.71	2.90	2.32	2.92	527
	BLACK	2.25	3.30	5.25	5.36	6.47	10.47	8.27	5.65	8.87	1601
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	18042

(continued)

TABLE 4.1 (CONTINUED)

8 ENGINEERING TECHNICIANS	WHITE	99.72	99.23	99.19	98.31	97.20	96.38	94.48	93.94	92.85	58051
	COLOURED	0.22	0.34	0.46	0.80	1.17	1.57	2.89	2.92	3.46	2165
	ASIAN	0.01	0.41	0.31	0.61	0.80	1.09	1.49	1.93	2.17	1354
	BLACK	0.05	0.02	0.04	0.29	0.83	0.96	1.13	1.21	1.52	951
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	62521
9 OTHER TECHNICIANS	WHITE	92.58	91.76	89.29	86.45	86.63	79.06	79.08	81.88	75.83	39003
	COLOURED	2.16	1.50	1.97	2.69	2.73	4.99	4.63	4.14	5.57	2863
	ASIAN	1.44	1.04	1.29	1.79	2.21	2.95	4.51	4.30	5.13	2637
	BLACK	3.82	5.70	7.45	9.06	6.43	14.00	11.78	9.68	13.47	6930
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	51433
10 ATTORNEY/ADVOCATE, ETC.	WHITE	99.13	99.31	97.90	98.37	96.64	95.04	94.95	96.73	94.20	8661
	COLOURED	0.0	0.39	0.28	0.38	0.45	0.20	0.26	0.03	0.13	12
	ASIAN	0.62	0.03	1.17	0.72	1.59	0.26	2.48	0.93	1.71	157
	BLACK	0.25	0.27	0.65	0.53	1.31	4.50	2.32	2.32	3.97	366
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	9216
11 TEACHERS, ETC.	WHITE	43.75	45.39	45.49	46.89	43.36	38.61	40.09	42.50	38.33	116191
	COLOURED	13.67	14.61	15.21	12.94	12.90	13.00	15.60	16.37	15.58	47222
	ASIAN	5.46	5.55	5.19	4.95	4.46	4.09	4.50	4.61	4.12	12491
	BLACK	37.13	34.45	34.11	35.21	39.28	44.29	39.81	36.52	41.97	127235
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.02	100.00	100.00	100.00	303145
12 CLERGYMEN, ETC.	WHITE	75.94	87.90	78.55	55.23	55.11	61.77	68.44	73.78	61.64	7012
	COLOURED	1.48	0.57	4.98	7.10	7.05	0.62	1.78	8.93	5.57	634
	ASIAN	0.40	0.13	0.16	0.32	0.28	0.43	0.50	0.41	0.53	61
	BLACK	22.18	10.99	16.31	37.35	37.56	37.17	29.28	16.88	32.25	3669
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	11376
13 OTHER PROF. WORKERS	WHITE	94.57	94.39	94.42	94.03	91.71	89.58	90.45	89.44	88.02	81642
	COLOURED	1.48	1.16	1.04	1.31	1.77	2.16	1.93	2.32	2.53	2351
	ASIAN	0.43	0.93	0.51	0.85	1.71	2.12	2.68	2.42	3.11	2886
	BLACK	3.52	3.52	4.03	3.81	4.81	6.14	4.90	5.82	6.33	5874
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	92754
14 MANAGERIAL WORKERS ETC.	WHITE	97.98	96.66	97.15	97.02	96.02	94.18	96.70	95.09	94.47	211118
	COLOURED	0.17	0.28	0.36	0.51	0.63	0.74	0.73	1.33	1.34	2986
	ASIAN	1.63	2.09	1.76	2.08	2.87	2.40	2.06	2.05	2.38	5309
	BLACK	0.22	0.98	0.73	0.39	0.47	2.67	0.51	1.54	1.81	4055
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	223468
15 CLERICAL WORKERS	WHITE	83.13	82.23	80.73	78.80	75.53	72.29	67.81	68.82	64.45	536078
	COLOURED	4.11	4.47	5.15	5.05	6.53	7.03	8.20	8.49	9.43	78421
	ASIAN	3.70	3.79	4.67	5.97	6.20	7.23	7.23	7.60	8.62	71678
	BLACK	9.06	9.51	9.44	10.18	11.74	13.45	16.75	15.09	17.51	145634
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	831811

(continued)

TABLE 4.1 (CONTINUED)

	WHITE	72.70	69.17	70.94	67.04	62.35	65.34	59.67	56.04	54.34	206354
	COLOURED	4.83	6.15	5.59	6.08	7.47	9.85	10.35	10.61	12.13	46070
16 SALES WORKERS	ASIAN	7.27	7.32	6.74	9.92	9.22	8.36	8.25	8.85	9.13	34664
	BLACK	15.20	17.36	16.72	16.96	20.95	16.45	21.73	24.50	24.41	92691
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	379779
	WHITE	36.99	33.84	30.67	26.60	26.39	24.15	21.44	21.60	17.83	66967
	COLOURED	12.42	11.80	11.24	11.33	10.56	10.09	11.16	11.48	10.79	40293
17 TRANSPORT WORKERS	ASIAN	3.24	3.21	3.48	3.74	3.44	4.02	3.48	3.54	4.01	14968
	BLACK	47.34	51.16	54.60	58.34	59.61	61.74	63.92	62.58	67.37	251512
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	373350
	WHITE	24.03	22.83	20.46	20.41	19.98	18.85	21.93	21.37	20.18	132313
	COLOURED	11.19	10.85	11.30	11.42	11.13	12.44	10.72	11.10	11.50	75395
18 SERVICE WORKERS	ASIAN	4.88	4.94	4.16	4.01	3.80	3.16	3.73	3.29	2.91	19085
	BLACK	59.91	61.39	64.08	64.15	65.09	65.55	63.63	64.25	65.42	428999
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	655791
	WHITE	12.46	13.08	11.98	10.14	9.70	9.56	7.85	7.90	6.64	126613
	COLOURED	12.79	13.13	13.26	13.34	13.30	13.78	10.84	12.43	11.73	223653
19 PRODUCTION WORKERS	ASIAN	4.46	4.31	4.89	4.79	4.62	4.55	3.61	4.31	3.90	74366
	BLACK	70.29	69.48	69.87	71.73	72.38	72.10	77.70	75.35	77.73	1482520
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1907152
	WHITE	76.73	76.81	71.71	71.50	68.89	69.04	59.07	56.85	54.15	59014
	COLOURED	6.96	8.38	8.08	8.08	8.55	7.82	9.66	11.36	11.02	12009
20 FOREMEN AND SUPERVISORS	ASIAN	2.79	2.41	3.25	4.22	4.20	4.81	3.29	3.50	4.20	4575
	BLACK	13.52	12.40	16.95	16.23	18.35	18.33	27.98	28.29	30.63	33382
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	108980
	WHITE	88.45	86.70	85.51	82.10	78.50	76.98	72.73	74.07	69.30	256801
	COLOURED	9.97	10.69	12.42	12.58	14.86	16.29	16.93	17.10	19.02	70471
21 ARTISANS AND APPRENTICES	ASIAN	1.18	1.47	1.35	2.25	2.25	2.65	2.64	3.68	3.86	14298
	BLACK	0.40	1.15	0.72	3.07	4.39	4.08	7.70	5.15	7.82	29373
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	370947
	WHITE	2.23	1.90	1.38	1.23	0.98	0.87	0.50	0.55	0.22	3065
	COLOURED	10.16	9.33	9.97	9.39	9.46	9.54	10.66	12.55	11.78	166735
22 LABOURERS	ASIAN	1.34	1.07	0.99	0.83	0.98	0.87	0.99	1.16	0.96	13523
	BLACK	86.27	87.70	87.66	88.54	88.58	88.73	87.85	85.73	87.04	1231527
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1414550
	WHITE	32.54	31.52	30.42	30.72	29.97	29.68	28.82	30.04	29.07	2036367
	COLOURED	9.84	9.76	10.20	9.93	10.27	10.65	10.35	11.36	11.27	789284
TOTAL	ASIAN	3.22	3.08	3.24	3.61	3.60	3.61	3.50	3.94	3.97	278222
	BLACK	54.40	55.64	56.14	55.73	56.16	56.05	57.33	54.45	55.69	3900927
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	7004800

TABLE 4.2(a)

SEX STRUCTURE BY OCCUPATIONAL GROUP OF THE WHITE LABOUR FORCE
IN 1965-1979 AND THE PROJECTED DISTRIBUTION IN 1987

OCCUPATIONAL GROUP	SEX	BASE PERIOD								TARGET YEAR = 1987	
		1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	M	98.09	95.75	98.90	96.50	96.93	97.41	97.75	97.29	97.54	6690
	F	1.91	4.25	1.10	3.50	3.07	2.59	2.25	2.71	2.46	169
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	6859
2 ENGINEERS, ETC.	M	99.91	99.80	99.90	99.78	99.86	99.83	99.61	99.57	99.55	21761
	F	0.09	0.20	0.10	0.22	0.14	0.17	0.39	0.43	0.45	98
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	21859
3 SURVEYORS	M	100.00	99.53	100.00	99.79	100.00	99.47	99.85	99.37	99.43	4032
	F	0.0	0.47	0.0	0.21	0.0	0.53	0.15	0.63	0.57	23
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	4055
4 NATURAL SCIENTISTS	M	94.83	94.44	94.29	93.32	87.83	85.30	87.36	85.26	82.76	10958
	F	5.17	5.56	5.71	6.68	12.17	14.70	12.64	14.74	17.24	2283
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	13241
5 MEDICAL DOCTORS, ETC.	M	96.37	96.14	95.91	93.41	92.63	93.06	91.65	92.99	91.16	17069
	F	3.63	3.86	4.09	6.59	7.37	6.94	8.35	7.01	8.84	1655
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	18724
6 NURSES AND MIDWIVES	M	7.39	6.50	5.93	5.92	4.20	4.84	3.23	3.35	2.38	1139
	F	92.61	93.50	94.07	94.08	95.80	95.16	96.77	96.65	97.62	46689
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	47828
7 OTHER PARAMEDICAL WORKERS	M	66.50	67.40	62.11	59.10	56.23	49.80	49.72	52.44	45.18	6924
	F	33.50	32.60	37.89	40.90	43.77	50.20	50.28	47.56	54.82	8403
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	15327
8 ENGINEERING TECHNICIANS	M	97.00	97.61	98.01	97.16	97.45	96.71	96.78	96.54	96.32	55914
	F	3.00	2.39	1.99	2.84	2.55	3.29	3.22	3.46	3.68	2134
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	58048
9 OTHER TECHNICIANS	M	82.91	84.71	83.20	80.50	76.02	74.19	74.45	78.00	72.25	28181
	F	17.09	15.29	16.80	19.50	23.98	25.81	25.55	22.00	27.75	10822
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	39003
10 ATTORNEY/ADVOCATE, ETC.	M	97.79	98.56	98.42	96.91	96.31	96.50	94.45	94.87	93.86	8148
	F	2.21	1.44	1.58	3.09	3.69	3.50	5.55	5.13	6.14	533
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	8681
11 TEACHERS, ETC.	M	45.73	46.11	47.95	44.40	44.92	46.70	46.66	44.85	46.57	54107
	F	54.27	53.89	52.05	55.60	55.08	53.30	53.34	55.15	53.43	62084
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	116191
12 CLERGYMEN, ETC.	M	98.38	98.99	99.22	98.22	97.54	98.02	99.11	90.76	93.59	6563
	F	1.62	1.01	0.78	1.78	2.46	1.98	0.89	9.24	6.41	449
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	7012
13 OTHER PROF. WORKERS	M	86.00	85.01	85.66	83.22	83.09	81.88	80.65	77.60	77.03	62890
	F	14.00	14.99	14.32	16.78	16.91	18.12	19.35	22.40	22.97	19752
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	81642

(continued)

TABLE 4.2(a) (CONTINUED)

	M	91.56	91.65	92.88	91.88	92.47	91.47	88.40	86.26	86.57	182760
14 MANAGERIAL WORKERS ETC.	F	8.44	8.35	7.12	8.12	7.53	8.53	11.60	13.74	13.43	28358
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	211118
	M	41.16	39.80	38.93	34.42	32.65	31.61	29.02	26.97	24.18	129600
15 CLERICAL WORKERS	F	58.84	60.20	61.07	65.58	67.35	68.39	70.98	73.03	75.82	406478
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	536078
	M	50.90	52.23	49.36	54.37	50.19	48.85	50.52	51.07	49.66	102473
16 SALES WORKERS	F	49.10	47.77	50.64	45.63	49.81	51.15	49.48	48.93	50.34	103881
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	206354
	M	87.96	87.46	87.45	86.85	85.10	83.21	84.03	82.23	81.20	54050
17 TRANSPORT WORKERS	F	12.04	12.54	12.55	13.15	14.90	16.79	15.97	17.77	18.80	12517
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	66567
	M	75.20	72.42	71.77	70.21	71.92	71.20	74.58	71.85	72.27	95626
18 SERVICE WORKERS	F	24.80	27.58	28.23	29.79	28.08	28.80	25.42	28.15	27.73	36687
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	132313
	M	85.75	86.53	87.22	90.32	89.86	91.07	92.77	91.80	94.03	119051
19 PRODUCTION WORKERS	F	14.25	13.47	12.78	9.68	10.14	8.93	7.23	8.20	5.97	7562
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	126613
	M	93.01	93.99	92.69	95.12	95.15	94.91	95.14	94.88	95.33	56256
20 FOREMEN AND SUPERVISORS	F	6.99	6.01	7.31	4.88	4.85	5.09	4.86	5.12	4.67	2758
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	59014
	M	97.37	97.21	97.06	97.08	97.70	97.02	96.44	96.74	96.50	247814
21 ARTISANS AND APPRENTICES	F	2.63	2.79	2.94	2.92	2.30	2.98	3.56	3.26	3.50	8987
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	256801
	M	98.14	97.54	98.53	98.12	98.53	97.52	98.53	99.71	99.13	3038
22 LABOURERS	F	1.86	2.46	1.47	1.88	1.47	2.48	1.47	0.29	0.87	27
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	3065
	M	70.06	70.76	69.59	67.98	67.34	66.34	65.63	64.25	62.61	1275044
TOTAL	F	29.94	29.24	30.41	32.02	32.66	33.66	34.37	35.75	37.39	761323
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	2036367

TABLE 4.2 (b)

SEX STRUCTURE BY OCCUPATIONAL GROUP OF THE COLOURED LABOUR FORCE
IN 1965–1979 AND THE PROJECTED DISTRIBUTION IN 1987

OCCUPATIONAL GROUP	SEX	BASE PERIOD								TARGET YEAR : 1987	
		1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	M	0.0	0.0	0.0	100.00	100.00	100.00	100.00	100.00	100.00	256
	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	256
2 ENGINEERS, ETC.	M	100.00	0.0	0.0	100.00	100.00	55.56	100.00	100.00	85.36	49
	F	0.0	0.0	0.0	0.0	0.0	44.44	0.0	0.0	14.64	8
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	57
3 SURVEYORS	M	0.0	0.0	0.0	100.00	100.00	100.00	100.00	100.00	100.00	244
	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	244
4 NATURAL SCIENTISTS	M	100.00	100.00	100.00	100.00	79.17	100.00	81.61	61.42	65.64	179
	F	0.0	0.0	0.0	0.0	20.83	0.0	18.39	38.58	34.36	94
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	273
5 MEDICAL DOCTORS, ETC.	M	92.86	85.71	84.75	92.63	87.04	86.82	82.86	82.91	81.56	310
	F	7.14	14.29	15.25	7.37	12.96	13.18	17.14	17.09	18.44	70
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	380
6 NURSES AND MIDWIVES	M	1.59	1.86	1.71	2.80	2.66	3.62	1.06	3.83	3.28	532
	F	98.41	98.14	98.29	97.20	97.34	96.38	98.94	96.17	96.72	15679
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	16211
7 OTHER PARAMEDICAL WORKERS	M	50.00	76.09	51.06	51.92	19.11	47.87	55.16	30.77	35.84	210
	F	50.00	23.91	48.94	48.08	80.89	52.13	44.84	69.23	64.16	377
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	587
8 ENGINEERING TECHNICIANS	M	100.00	78.95	92.31	100.00	99.62	97.77	99.92	99.02	99.91	2163
	F	0.0	21.05	7.69	0.0	0.38	2.23	0.08	0.98	0.09	2
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	2165
9 OTHER TECHNICIANS	M	90.84	88.99	85.57	80.03	77.58	73.21	74.91	73.74	68.71	1967
	F	9.16	11.01	14.43	19.97	22.42	26.79	25.09	26.26	31.29	896
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	2863
10 ATTORNEY/ADVOCATE, ETC.	M	0.0	100.00	94.44	100.00	100.00	86.67	95.00	100.00	93.37	11
	F	0.0	0.0	5.56	0.0	0.0	13.33	5.00	0.0	6.63	1
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	12
11 TEACHERS, ETC.	M	51.94	56.36	53.38	55.93	41.15	53.92	38.88	36.96	35.62	16821
	F	48.06	43.64	46.62	44.07	58.85	46.08	61.12	63.04	64.38	30407
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	47228
12 CLERGYMEN, ETC.	M	82.93	100.00	100.00	100.00	100.00	98.21	98.82	58.06	76.50	485
	F	17.07	0.0	0.0	0.0	0.0	1.79	1.18	41.94	23.50	149
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	634
13 OTHER PROF. WORKERS	M	63.23	45.19	63.23	68.81	66.99	53.04	64.49	67.34	65.52	1540
	F	36.77	54.81	36.77	31.19	33.01	46.96	35.51	32.66	34.48	811
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	2351

(continued)

TABLE 4.2 (b) (CONTINUED)

	M	100.00	79.22	84.86	90.36	88.50	68.27	92.25	71.65	72.23	2157
14 MANAGERIAL WORKERS ETC.	F	0.0	20.78	15.14	9.64	11.50	31.73	7.75	28.35	27.77	829
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	2986
	M	74.58	72.87	68.18	65.54	57.12	52.23	53.19	49.55	43.35	33994
15 CLERICAL WORKERS	F	25.42	27.13	31.82	34.46	42.88	47.77	46.81	50.45	56.65	44427
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	78421
	M	60.23	59.80	56.52	50.14	54.34	45.78	52.31	40.75	39.96	18407
16 SALES WORKERS	F	39.77	40.20	43.48	49.86	45.66	54.22	47.69	59.25	60.04	27663
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	46070
	M	99.06	99.19	99.07	98.55	98.46	98.05	97.49	97.29	96.93	39046
17 TRANSPORT WORKERS	F	0.94	0.81	0.93	1.45	1.54	1.95	2.51	2.71	3.07	1237
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	40283
	M	43.88	46.19	45.01	38.85	40.67	40.58	40.90	47.87	42.21	31826
18 SERVICE WORKERS	F	56.12	53.81	54.99	61.15	59.33	59.42	59.10	52.13	57.79	43569
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	75395
	M	55.12	51.97	49.12	47.68	49.56	49.96	55.35	54.74	54.56	122024
19 PRODUCTION WORKERS	F	44.88	48.03	50.88	52.32	50.44	50.04	44.65	45.26	45.44	101629
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	223653
	M	64.72	67.58	66.18	71.02	70.86	65.30	73.08	75.40	75.21	9032
20 FOREMEN AND SUPERVISORS	F	35.28	32.42	33.82	28.98	29.14	34.70	26.92	24.60	24.79	2977
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	12009
	M	99.73	99.81	99.75	99.75	99.02	98.47	98.32	96.37	96.48	67993
21 ARTISANS AND APPRENTICES	F	0.27	0.19	0.25	0.25	0.98	1.53	1.68	3.63	3.52	2478
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	70471
	M	88.32	88.85	88.48	88.89	86.36	88.69	84.67	84.94	84.43	140769
22 LABOURERS	F	11.68	11.15	11.52	11.11	13.64	11.31	15.33	15.06	15.57	25966
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	166735
	M	69.79	69.42	67.83	65.99	64.85	64.42	65.80	64.38	62.08	490015
TOTAL	F	30.21	30.58	32.17	34.01	35.15	35.58	34.20	35.62	37.92	299269
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	789284

TABLE 4.2 (c)

SEX STRUCTURE BY OCCUPATIONAL GROUP OF THE ASIAN LABOUR FORCE
IN 1965-1979 AND THE PROJECTED DISTRIBUTION IN 1987

OCCUPATIONAL GROUP	SEX	BASE PERIOD								TARGET YEAR = 1987	
		1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	M	100.00	0.0	100.00	100.00	100.00	100.00	100.00	100.00	100.00	48
	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	48
2 ENGINEERS, ETC.	M	100.00	100.00	100.00	100.00	100.00	94.12	100.00	100.00	97.77	69
	F	0.0	0.0	0.0	0.0	0.0	5.88	0.0	0.0	2.23	2
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	71
3 SURVEYORS	M	0.0	0.0	0.0	100.00	100.00	100.00	100.00	100.00	100.00	30
	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	30
4 NATURAL SCIENTISTS	M	100.00	100.00	100.00	93.75	76.83	90.55	88.43	92.73	86.05	211
	F	0.0	0.0	0.0	6.25	23.17	9.45	11.57	7.27	13.95	34
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	245
5 MEDICAL DOCTORS, ETC.	M	88.79	91.56	95.83	84.52	96.32	95.21	88.03	88.72	89.76	1186
	F	11.21	8.44	4.17	15.48	3.68	4.79	11.97	11.28	10.24	135
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1321
6 NURSES AND MIDWIVES	M	7.69	9.00	5.61	12.18	9.25	5.51	3.53	2.04	1.83	72
	F	92.31	91.00	94.39	87.82	90.75	94.49	96.47	97.96	98.17	3826
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	3898
7 OTHER PARAMEDICAL WORKERS	M	85.37	72.31	56.98	69.44	48.43	51.89	47.18	57.41	49.70	262
	F	14.63	27.69	43.02	30.56	51.57	48.11	52.82	42.59	50.30	265
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	527
8 ENGINEERING TECHNICIANS	M	100.00	100.00	100.00	100.00	100.00	100.00	100.00	99.01	99.39	1346
	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.99	0.61	8
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1354
9 OTHER TECHNICIANS	M	97.78	95.83	93.66	89.43	88.61	90.09	75.84	90.63	80.21	2115
	F	2.22	4.17	6.34	10.57	11.39	9.91	24.16	9.37	19.79	522
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	2637
10 ATTORNEY/ADVOCATE, ETC.	M	100.00	100.00	90.54	100.00	85.00	95.00	99.48	80.82	86.19	135
	F	0.0	0.0	9.46	0.0	15.00	5.00	0.52	19.18	13.81	22
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	157
11 TEACHERS, ETC.	M	71.58	69.88	70.42	68.18	67.15	64.78	62.93	59.56	58.19	7269
	F	28.42	30.12	29.58	31.82	32.85	35.22	37.07	40.44	41.81	5223
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	12491
12 CLERGYMEN, ETC.	M	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	61
	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	61
13 OTHER PROF. WORKERS	M	100.00	80.72	89.27	86.99	89.53	77.59	70.28	83.94	70.81	2044
	F	0.0	19.28	10.73	13.01	10.47	22.41	29.72	16.06	29.19	842
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	2886

(continued)

TABLE 4.2 (c) (CONTINUED)

14 MANAGERIAL,WORKERS ETC.	M	97.11	98.85	97.38	93.18	96.20	97.87	95.68	94.02	94.76	5031
	F	2.89	1.15	2.62	6.82	3.80	2.13	4.32	5.98	5.24	278
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	5309
15 CLERICAL WORKERS	M	93.35	92.43	91.82	87.16	83.51	77.44	76.65	71.46	67.45	48346
	F	6.65	7.57	8.18	12.84	16.49	22.56	23.35	28.54	32.55	23332
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	71678
16 SALES WORKERS	M	93.20	87.53	85.18	79.76	83.42	69.44	71.48	68.86	62.81	21772
	F	6.80	12.47	14.82	20.24	16.58	30.56	28.52	31.14	37.19	12892
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	34664
17 TRANSPORT WORKERS	M	99.61	99.46	99.42	99.22	98.93	97.31	96.97	96.92	96.20	14416
	F	0.39	0.54	0.58	0.78	1.07	2.69	3.03	3.08	3.80	570
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	14988
18 SERVICE WORKERS	M	89.71	90.12	87.77	80.45	85.29	83.56	80.53	79.58	77.58	14807
	F	10.29	9.88	12.23	19.55	14.71	16.44	19.47	20.42	22.42	4278
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	19085
19 PRODUCTION WORKERS	M	86.77	87.21	78.99	75.10	71.83	70.08	60.50	57.41	51.96	38642
	F	13.23	12.79	21.01	24.90	28.17	29.92	39.50	42.59	48.04	35724
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	74366
20 FOREMEN AND SUPERVISORS	M	99.50	99.63	99.13	96.44	96.38	94.56	89.57	92.76	89.25	4083
	F	0.50	0.37	0.87	3.56	3.62	5.44	10.43	7.24	10.75	492
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	4575
21 ARTISANS AND APPRENTICES	M	98.12	99.46	99.55	99.69	98.48	98.55	97.33	98.03	97.36	13920
	F	1.88	0.54	0.45	0.31	1.52	1.45	2.67	1.97	2.64	378
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	14298
22 LABOURERS	M	93.04	92.60	94.70	92.65	87.99	89.25	85.35	93.22	87.45	11825
	F	6.96	7.40	5.30	7.35	12.01	10.75	14.65	6.78	12.55	1698
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	13523
TOTAL	M	89.57	89.02	85.32	81.66	80.73	77.33	73.66	71.09	67.46	187691
	F	10.43	10.98	14.68	18.34	19.27	22.67	26.34	28.91	32.54	90531
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	278222

TABLE 4.2 (d)

SEX STRUCTURE BY OCCUPATIONAL GROUP OF THE BLACK LABOUR FORCE
IN 1965–1979 AND THE PROJECTED DISTRIBUTION IN 1987

OCCUPATIONAL GROUP	SEX	BASE PERIOD								TARGET YEAR : 1987	
		1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	M	0.0	0.0	0.0	0.0	0.0	100.00	76.19	85.71	82.54	26
	F	0.0	0.0	0.0	0.0	0.0	0.0	23.81	14.29	17.46	6
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	32
2 ENGINEERS, ETC.	M	0.0	100.00	0.0	100.00	100.00	100.00	100.00	100.00	100.00	14
	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	14
3 SURVEYORS	M	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	470
	F	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	470
4 NATURAL SCIENTISTS	M	100.00	100.00	100.00	100.00	100.00	97.95	97.38	97.13	96.51	729
	F	0.0	0.0	0.0	0.0	0.0	2.05	2.62	2.87	3.49	26
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	755
5 MEDICAL DOCTORS, ETC.	M	92.73	90.74	91.30	92.16	95.65	95.29	84.14	93.00	89.73	174
	F	7.27	9.26	8.70	7.84	4.35	4.71	15.86	7.00	10.27	20
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	194
6 NURSES AND MIDWIVES	M	4.58	7.03	9.24	11.37	6.61	6.92	4.79	3.99	3.86	2070
	F	95.42	92.97	90.76	88.63	93.39	93.08	95.21	96.01	96.14	51500
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	53570
7 OTHER PARAMEDICAL WORKERS	M	94.12	83.85	62.01	60.65	62.99	55.59	50.52	49.54	47.58	762
	F	5.88	16.15	37.99	39.35	37.01	44.41	49.48	50.46	52.42	839
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1601
8 ENGINEERING TECHNICIANS	M	80.00	100.00	100.00	100.00	100.00	97.76	100.00	99.41	99.94	950
	F	20.00	0.0	0.0	0.0	0.0	2.24	0.0	[illegible]	0.06	1
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	951
9 OTHER TECHNICIANS	M	98.60	97.19	96.78	94.85	96.31	95.17	94.38	92.17	91.83	6364
	F	1.40	2.81	3.22	5.15	3.69	4.83	5.62	7.83	8.17	566
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	6930
10 ATTORNEY/ADVOCATE, ETC.	M	100.00	100.00	100.00	100.00	85.86	100.00	100.00	97.81	97.36	356
	F	0.0	0.0	0.0	0.0	14.14	0.0	0.0	2.19	2.64	10
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	366
11 TEACHERS, ETC.	M	55.03	46.89	50.49	49.13	48.91	47.57	44.15	41.96	40.77	51873
	F	44.97	53.11	49.51	50.87	51.09	52.43	55.85	58.04	59.23	75362
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	127235
12 CLERGYMEN, ETC.	M	80.78	95.11	98.02	99.20	98.61	98.59	99.89	95.24	99.03	3633
	F	19.22	4.89	1.98	0.80	1.39	1.41	0.11	4.76	0.97	36
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	3669
13 OTHER PROF. WORKERS	M	81.33	82.66	82.11	75.14	73.74	83.33	84.66	77.93	81.18	4768
	F	18.67	17.34	17.89	24.86	26.26	16.67	15.34	22.07	18.82	1106
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	[illegible]	100.00	5874

(continued)

TABLE 4.2 (d) (CONTINUED)

	M	98.19	95.07	96.65	89.41	89.89	97.86	96.06	82.49	87.70	3556
14 MANAGERIAL,WORKERS ETC.	F	1.81	4.93	3.35	10.59	10.11	2.14	3.94	17.51	12.30	499
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	4055
	M	97.12	95.67	95.45	93.19	92.70	90.99	89.44	82.74	82.70	120445
15 CLERICAL WORKERS	F	2.88	4.33	4.55	6.81	7.30	9.01	10.56	17.26	17.30	25189
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	145634
	M	89.71	86.39	85.38	78.00	81.39	74.62	71.05	60.82	58.88	54575
16 SALES WORKERS	F	10.29	13.61	14.62	22.00	18.61	25.38	28.95	39.18	41.12	38116
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	92691
	M	99.56	99.67	99.71	99.43	99.52	99.27	98.57	98.59	98.55	247868
17 TRANSPORT WORKERS	F	0.44	0.33	0.29	0.57	0.48	0.73	1.43	1.41	1.45	3644
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	251512
	M	82.20	79.68	77.35	73.05	71.90	71.22	67.51	66.14	62.82	269471
18 SERVICE WORKERS	F	17.80	20.32	22.65	26.95	28.10	28.78	32.49	33.86	37.18	159497
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	428968
	M	96.43	94.78	94.13	92.73	93.08	92.08	93.05	91.70	91.81	1361035
19 PRODUCTION WORKERS	F	3.57	5.22	5.87	7.27	6.92	7.92	6.95	8.30	8.19	121484
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1482519
	M	98.56	98.15	98.90	98.37	97.82	97.62	97.80	96.65	96.67	32271
20 FOREMEN AND SUPERVISORS	F	1.44	1.85	1.10	1.63	2.18	2.38	2.20	3.35	3.33	1111
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	33382
	M	100.00	100.00	100.00	100.00	100.00	99.97	99.22	97.85	98.26	28474
21 ARTISANS AND APPRENTICES	F	0.0	0.0	0.0	0.0	0.0	0.03	0.78	2.15	1.74	503
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	28977
	M	97.14	96.61	96.92	96.11	94.52	95.46	94.52	93.37	93.02	1145528
22 LABOURERS	F	2.86	3.39	3.08	3.89	5.48	4.54	5.48	6.63	6.98	85998
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1231526
	M	94.11	93.00	92.67	90.99	90.04	89.32	88.68	86.91	85.50	3335412
TOTAL	F	5.89	7.00	7.33	9.01	9.96	10.68	11.32	13.09	14.50	565513
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	3900925

The data presented in the tables thus indicate certain trends that must be taken into account by the manpower planners in these organizations, and they will have to answer certain questions for themselves, for example:

Is the declining percentage of males due to technological innovations or are women appointed because males are unavailable?

How does the increasing number of women affect labour turnover and training?

How many trained women return to the labour market and should they be retrained?

Is the increasing number of Black clerical personnel due to increasing activity in mainly Black areas, or is the labour force becoming more integrated?

How are these trends going to affect the supply of managers in the future?

The above are only indications of the type of questions on which organizations must obtain clarity. The answers would depend on the situation of the specific organization but the question illustrates the interaction between the external manpower situation and data that must be obtained from the internal information system.

In the interpretation and discussion which follow, it will be noted that attention is only paid to the general observed trends. The estimates for 1987 are projections of past trends and because of the method of projection used, trends are extrapolated conservatively. The estimates or projections indicate the situation we are moving into if the trends of the past should continue and are therefore not an attempt to forecast the reality of the target year 1987. Because the estimates are projections, absurd results can be obtained. This, however, does not mean that the results are useless because the absurdity of the results tells a story. The absurdity indicates that past trends cannot continue. The Statistician's Lament comes to mind:

"A trend is a trend is a trend.
The question is
when will it bend?"

Tables 4.3 (a) and (b) and Figure 4 indicate that the projections do not result in dramatic changes in the occupational structure. The conclusion that small changes in the structure have little implication for manpower planning, would however be wrong. The total labour force (farmers, farm labourers and domestic servants excluded) is taken into account and small percentage differences could mean a shift of quite a large number of workers. Table 4.3 (a) indicates, for example, that it is estimated that the percentage of managerial workers will increase from

2,62 % in 1977 to 3,19 % in 1987, that is to say an increase of only 0,57 % over the ten years. If the percentage should remain constant at 2,62 % the number of managerial workers would have increased from 140 500 to 183 500, an increase of 43 000. The estimate shows a demand of 253 000 which means that the increase of 0,57 % gives rise to an increased demand of 70 000 managerial workers or 7 000 per annum over the period of estimate. The needs are furthermore influenced by the death and retirement of workers. Should the age distribution in an occupation be more or less equal to that of the labour force in general, it can be expected that ± 2 % of the personnel in an occupation will have to be replaced annually because of these two erosion factors.

The data presented in Tables 4.3 (a) and (b) indicate the two main manpower problems in the RSA, namely a shortage of skilled manpower and a lack of job opportunities. The conservative projections of demand (Table 4.3 (b)) show an annual growth rate in demand for White workers of 2,8 % per annum. Table 3.4 (b) on the other hand shows that supply will increase at a rate of 1,3 % per annum for men and 2,4 % per annum for women (1,7 % in total). The conclusion is clear. Even the conservative projections of past trends lead to an unobtainable target and the demand cannot be met under the given circumstances. It can also be expected that the major problems will occur in those occupations for which a relatively high growth rate is estimated. This aspect will again arise in Chapter 5 where the demand-supply situation in certain occupations is dealt with in more detail, but it underlines the necessity for the utilization of the full potential of all the peoples in the RSA. The magnitude of the problem must not be underestimated, especially when the aspirations of the Non-Whites, and the tendency of Whites to defend vested interests and maintain the *status quo* are taken into account. In the interpretation of the data supplied in Tables 4.3 (a) and (b), little attention should be paid to growth rates in occupations where only small numbers occur. As a practical rule of thumb one can take 1 000 workers in a category as limit. Small numbers frequently occur in some of the professional occupations for Non-Whites. The data illustrate, however, that Non-Whites are moving into most of the occupations listed at a reasonable rate.

Table 4.3 (b) indicates that the changes in occupational structure follow the general trend of industrialized countries of the West. The professional workers (group 1 to 13 - see Figure 4), managerial workers, clerical and service workers show relative increases, that is to say the demand in these occupations is growing faster than the average, while artisans, production workers and labourers show relative decreases. The tertiary sector is becoming more important as job creator while the manufacturing sector is becoming more sophisticated and capital intensive.

As mentioned in the introduction to this chapter, the demand estimates for all accupations are based on a certain target growth rate in the GDP. The criterion of economic growth is not very suitable for estimates of demand in occupations such as teachers, nurses or doctors. For teachers the teacher : pupil ratio would be a

better criterion. The specific teacher : pupil ratio used in such an estimate would, however, not be based on scientific grounds, but rather on value judgements of what is good or bad. For nurses and doctors the population size and a certain postulated ratio of doctors or nurses to population, could be chosen as criterion. The question again arises as to what ratio should be used.

Economic growth as criterion has the advantage that, in the event of income structures and levels showing little real change, a country would be able to afford the estimated demand.

Tables 4.3 (a) and (b) show that, at an average annual growth of 4,5 % in the GDP, it is estimated that job opportunities will increase from 5 354 000 in 1977 to 7 005 000 in 1987, an increase of 1 651 000. According to Table 3.4 (a) the supply will increase by 2 669 000 workers. This gives a shortfall of just over 100 000 job opportunities. This figure underlines the second major manpower problem of the RSA, namely the creation of job opportunities.

This situation is perhaps of less direct importance to specific organizations in the private and public sectors. It is hardly necessary to point at the dangers inherent in unacceptable or unmanageable unemployment levels and the necessity of employment creation speaks for itself. Within the capitalist system it can hardly be expected that the individual entrepreneur will pay so much attention to the "common good" that he will opt for labour intensive technology if his profits are going to be affected by such a choice. The RSA also imports much of its technology from countries which do not share its problems of explosive population growth, and machines are at any rate much easier to manage than men. The trend towards a more capital intensive technology can hardly be reversed. The EDP also indicates how important exports are for growth, and sophisticated technology is perhaps the only way in which products can be produced at competitive prices. The unemployment problem is of such a magnitude, however, that governments will have to take a very careful look at the technology used in the creation of infrastructure.

In this chapter very little attention was paid to the demand and supply situation in specific occupations. In the next chapter attention is focussed on a few occupations which can be regarded as being of key importance in economic growth.

TABLE 4.3 (a)

OCCUPATIONAL STRUCTURE OF THE LABOUR FORCE 1977 AND 1987

OCCUPATION	POPULATION GROUP							
	WHITE				COLOURED			
	1977		1987		1977		1987	
1 ARCHITECTS, ETC.	4128	.27	6859	.34	137	.02	256	.03
2 ENGINEERS, ETC.	15997	1.04	21859	1.07	15	.00	57	.01
3 SURVEYORS	3387	.22	4055	.20	16	.00	244	.03
4 NATURAL SCIENTISTS	8739	.57	13241	.65	87	.02	273	.03
5 MEDICAL DOCTORS, ETC.	11927	.77	18724	.92	175	.03	380	.05
6 NURSES AND MIDWIVES	33285	2.16	47798	2.35	8221	1.48	16211	2.05
7 OTHER PARAMEDICAL WORKERS	8974	.58	15327	.75	252	.05	587	.07
8 ENGINEERING TECHNICIANS	40002	2.59	58051	2.85	1225	.22	2165	.27
9 OTHER TECHNICIANS	30114	1.95	39003	1.92	1762	.32	2863	.36
10 ATTORNEY/ADVOCATE, ETC.	7441	.48	8681	.43	20	.00	12	.00
11 TEACHERS, ETC.	71183	4.61	116191	5.71	27696	5.00	47228	5.98
12 CLERGYMEN, ETC.	6487	.42	7012	.34	169	.03	634	.08
13 OTHER PROFESSIONAL WORKERS	54739	3.55	81643	4.01	1166	.21	2351	.30
14 MANAGERIAL WORKERS, ETC.	135845	8.80	211118	10.37	1032	.19	2986	.38
15 CLERICAL WORKERS	406396	26.34	536078	26.33	49174	8.87	78421	9.94
16 SALES WORKERS	146979	9.52	206354	10.13	25494	4.60	46070	5.84
17 TRANSPORT WORKERS	64759	4.20	66567	3.27	33697	6.08	40283	5.10
18 SERVICE WORKERS	108255	7.02	132313	6.50	52920	9.55	75395	9.55
19 PRODUCTION WORKERS	119263	7.73	126613	6.22	164657	29.71	223653	28.34
20 FOREMEN AND SUPERVISORS	43752	2.84	59014	2.90	7154	1.29	12009	1.52
21 ARTISANS AND APPRENTICES	215376	13.96	256801	12.61	50131	9.04	70471	8.93
22 LABOURERS	6064	.39	3065	.15	129058	23.28	166735	21.12
TOTAL	1543093	100.00	2036367	100.00	554258	100.00	789284	100.00

(continued)

TABLE 4.3 (a) (CONTINUED)

OCCUPATION	POPULATION GROUP							
	ASIAN				BLACK			
	1977		1987		1977		1987	
1 ARCHITECTS, ETC.	10	.01	48	.02	1- 21	.00	32	.00
2 ENGINEERS, ETC.	32	.02	71	.03	2- 6	.00	14	.00
3 SURVEYORS	16	.01	30	.01	3- 370	.01	470	.01
4 NATURAL SCIENTISTS	121	.06	245	.09	4- 191	.01	755	.02
5 MEDICAL DOCTORS, ETC.	685	.37	1321	.47	5- 145	.00	194	.00
6 NURSES AND MIDWIVES	1473	.79	3908	1.40	6- 37563	1.22	53570	1.37
7 OTHER PARAMEDICAL WORKERS	301	.16	527	.19	7- 859	.03	1601	.04
8 INGINEERING TECHNICIANS	631	.34	1354	.49	8- 479	.02	951	.02
9 OTHER TECHNICIANS	1718	.92	2637	.95	9- 4485	.15	6930	.18
10 ATTORNEY/ADVOCATE, ETC.	194	.10	157	.06	10- 182	.01	366	.01
11 TEACHERS, ETC.	7992	4.27	12491	4.49	11- 70689	2.30	127235	3.26
12 CLERGYMEN, ETC.	47	.03	61	.02	12- 2775	.09	3669	.09
13 OTHER PROFESSIONAL WORKERS	1622	.87	2886	1.04	13- 2966	.10	5874	.15
14 MANAGERIAL WORKERS, ETC.	2896	1.55	5309	1.91	14- 710	.02	4055	.10
15 CLERICAL WORKERS	43356	23.14	71678	25.76	15- 100412	3.27	145634	3.73
16 SALES WORKERS	20310	10.84	34664	12.46	16- 53523	1.74	92691	2.38
17 TRANSPORT WORKERS	10514	5.61	14988	5.39	17- 193060	6.29	251512	6.45
18 SERVICE WORKERS	18397	9.82	19085	6.86	18- 314131	10.23	428968	11.00
19 PRODUCTION WORKERS	54823	29.26	74366	26.73	19-1179945	38.44	1482520	38.00
20 FOREMEN AND SUPERVISORS	2435	1.30	4575	1.64	20- 20726	.68	33382	.86
21 ARTISANS AND APPRENTICES	7814	4.17	14298	5.14	21- 22801	.74	28977	.74
22 LABOURERS	11985	6.40	13523	4.86	22-1063662	34.65	1231527	31.57
TOTAL	187372	100.00	278222	100.00	23-3069701	100.00	3900927	100.00

(continued)

TABLE 4.3 (a) (CONTINUED)

OCCUPATION	TOTAL			
	1977		1987	
1 ARCHITECTS, ETC.	4296	.08	7195	.10
2 ENGINEERS, ETC.	16050	.30	22001	.31
3 SURVEYORS	3789	.07	4799	.07
4 NATURAL SCIENTISTS	9138	.17	14514	.21
5 MEDICAL DOCTORS, ETC.	12932	.24	20619	.29
6 NURSES AND MIDWIVES	80542	1.50	121487	1.73
7 OTHER PARAMEDICAL WORKERS	10386	.19	18042	.26
8 INGINEERING TECHNICIANS	42338	.79	62521	.89
9 OTHER TECHNICIANS	38079	.71	51433	.73
10 ATTORNEY/ADVOCATE, ETC.	7837	.15	9216	.13
11 TEACHERS, ETC.	177560	3.32	303145	4.33
12 CLERGYMEN, ETC.	9478	.18	11376	.16
13 OTHER PROFESSIONAL WORKERS	60493	1.13	92754	1.32
14 MANAGERIAL WORKERS, ETC.	140483	2.62	223468	3.19
15 CLERICAL WORKERS	599338	11.19	831811	11.87
16 SALES WORKERS	246306	4.60	379779	5.42
17 TRANSPORT WORKERS	302030	5.64	373350	5.33
18 SERVICE WORKERS	493703	9.22	655761	9.36
19 PRODUCTION WORKERS	1518688	28.36	1907152	27.23
20 FOREMEN AND SUPERVISORS	74067	1.38	108980	1.56
21 ARTISANS AND APPRENTICES	296122	5.53	370547	5.29
22 LABOURERS	1210769	22.61	1414850	20.20
TOTAL	5354424	100.00	7004800	100.00

TABLE 4.3 (b)

ANNUAL GROWTH RATE OF THE LABOUR FORCE IN THE REPUBLIC BY POPULATION GROUP FOR THE PERIOD 1977–1987

OCCUPATIONAL GROUP	POPULATION GROUP								
	WHITE			COLOURED			ASIAN		
	1977	1987	GROWTH RATE	1977	1987	GROWTH RATE	1977	1987	GROWTH RATE
1 ARCHITECTS, ETC.	4128	6859	5.21	137	256	6.45	10	48	16.98
2 ENGINEERS, ETC.	15997	21859	3.17	15	57	14.28	32	71	8.30
3 SURVEYORS	3387	4055	1.82	16	244	31.32	16	30	6.49
4 NATURAL SCIENTISTS	8739	13241	4.24	87	273	12.12	121	245	7.31
5 MEDICAL DOCTORS ETC.	11927	18724	4.61	175	380	8.06	685	1321	6.79
6 NURSES & MIDWIVES	33285	47798	3.68	8221	16211	7.03	1473	3908	10.25
7 OTHER PARAMEDICAL WORKERS	8974	15327	5.50	252	587	8.82	301	527	5.76
8 ENGINEERING TECHNICIANS	40003	58051	3.79	1225	2165	5.86	631	1354	7.93
9 OTHER TECHNICIANS	30114	39003	2.62	1762	2863	4.97	1718	2637	4.38
10 ATTORNEY, ADVOCATE, ETC.	7441	8681	1.55	20	12	-4.98	194	157	-2.09
11 TEACHERS, ETC.	71183	116191	5.02	27696	47228	5.48	7992	12491	4.57
12 CLERGYMEN, ETC.	6487	7012	0.78	169	634	14.14	47	61	2.64
13 OTHER PROFESSIONAL WORKERS	54739	81643	4.08	1166	2351	7.26	1622	2886	5.93
14 MANAGERIAL,ETC.WORKERS	135845	211118	4.51	1032	2986	11.21	2696	5309	6.25
15 CLERICAL WORKERS	406396	536078	2.81	49174	78421	4.78	43356	71678	5.16
16 SALES WORKERS	146979	206354	3.45	25494	46070	6.10	20310	34664	5.49
17 TRANSPORT WORKERS	64759	66567	0.28	33697	40263	1.80	10514	14988	3.61
18 SERVICE WORKERS	108255	132313	2.03	52920	75395	3.60	18397	19085	0.37
19 PRODUCTION WORKERS	119263	126613	0.60	164657	223653	3.11	54823	74366	3.10
20 FOREMEN AND SUPERVISORS	43752	59014	3.04	7154	12009	5.32	2435	4575	6.51
21 ARTISANS AND APPRENTICES	215376	256801	1.77	50131	70471	3.46	7814	14298	6.23
22 LABOURERS	6064	3065	-6.60	129058	166735	2.59	11985	13523	1.21
TOTAL	1543093	2036367	2.81	554258	789284	3.60	187272	278222	4.03

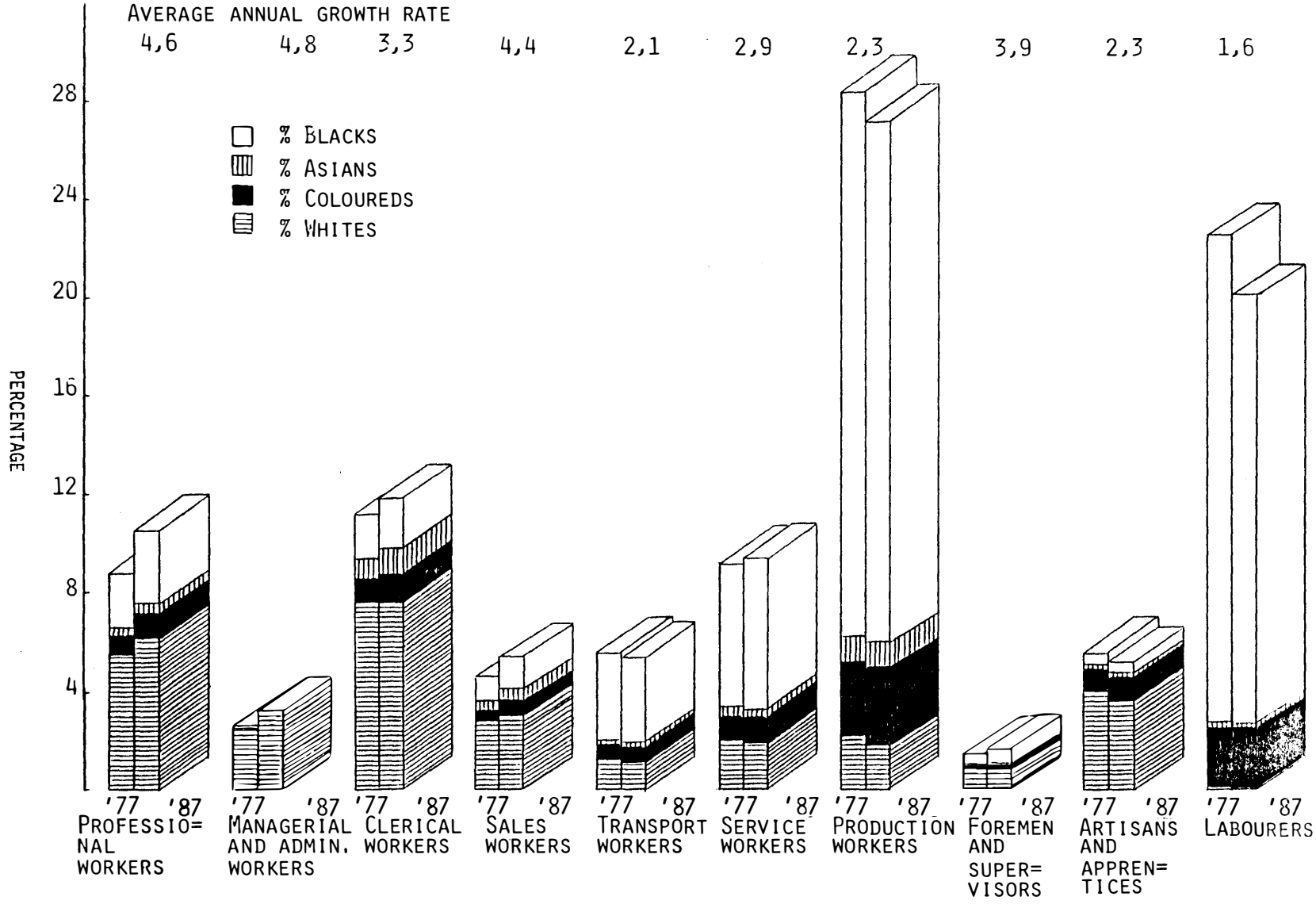
(continued)

TABLE 4.3 (b) (CONTINUED)

OCCUPATIONAL GROUP	BLACK			TOTAL		
	1977	1987	GROWTH RATE	1977	1987	GROWTH RATE
1 ARCHITECTS, ETC.	21	32	4.30	4296	7195	5.29
2 ENGINEERS, ETC.	6	14	8.84	16050	22001	3.20
3 SURVEYORS	370	470	2.42	3789	4799	2.39
4 NATURAL SCIENTISTS	191	755	14.73	9138	14514	4.74
5 MEDICAL DOCTORS ETC.	145	194	2.95	12932	20619	4.78
6 NURSES & MIDWIVES	37563	53570	3.61	80542	121487	4.20
7 OTHER PARAMEDICAL WORKERS	859	1601	6.42	10386	18042	5.66
8 ENGINEERING TECHNICIANS	479	951	7.10	42338	62521	3.98
9 OTHER TECHNICIANS	4485	6930	4.45	38079	51433	3.05
10 ATTORNEY, ADVOCATE, ETC.	182	366	7.24	7837	9216	1.63
11 TEACHERS, ETC.	70689	127235	6.05	177560	303145	5.49
12 CLERGYMEN, ETC.	2775	3669	2.83	9478	11376	1.84
13 OTHER PROFESSIONAL WORKERS	2966	5874	7.07	60493	92754	4.37
14 MANAGERIAL,ETC.WORKERS	710	4055	19.03	140483	223468	4.75
15 CLERICAL WORKERS	100412	145634	3.79	599338	821811	3.33
16 SALES WORKERS	53523	92691	5.65	246306	379779	4.43
17 TRANSPORT WORKERS	193060	251512	2.68	302030	373350	2.14
18 SERVICE WORKERS	314131	428968	3.16	493703	655761	2.88
19 PRODUCTION WORKERS	1179945	1482520	2.31	1518688	1907152	2.30
20 FOREMEN AND SUPERVISORS	20726	33382	4.88	74067	108980	3.94
21 ARTISANS AND APPRENTICES	22801	28977	2.43	296122	370547	2.27
22 LABOURERS	1063462	1231527	1.48	1210769	1414850	1.57
TOTAL	3069701	3900927	2.42	5354424	7004800	2.72

FIGURE 4

THE OCCUPATIONAL STRUCTURE OF THE SOUTH AFRICAN LABOUR FORCE, 1977 AND 1987



CHAPTER 5

THE DEMAND AND SUPPLY SITUATION IN SOME KEY OCCUPATIONS

5.1 INTRODUCTION

In the previous chapter the general manpower demand and supply situation was discussed. In this chapter attention is given to a few occupations that can be regarded as being of key importance to economic growth. These occupations are technology-oriented and all have a training input that lies outside the organization.

Various studies (OECD) have shown that technology and economic growth are positively correlated. The wealth of the advanced industrial nations of the West is at least partly due to their use of advanced technology. The engineering team (engineer, technician and artisan) is of special importance in the application of technology in the production process and these groups are, therefore, singled out for attention.

It is not so easy to prove any causal relationship between funds spent on research in the natural sciences and economic growth. All technology is, however, to some or other degree based on scientific principles and the great technological advances of today are more directly coupled with major scientific breakthroughs than was previously the case. Compare the steam engine with the computer for example. Natural scientists are thus also regarded as a key occupational group. These four occupational groups will in this chapter be referred to as "technological manpower" to make discussion easier.

One of the important factors to remember in the analysis of the demand and supply situation in these occupations, is that White males have dominated the scene in the past; 99 % of the engineers, 78 % of the natural scientists, 91 % of the technicians and 72 % of the artisans and apprentices were male and White in 1979.

5.2 THE DEMAND FOR TECHNOLOGICAL MANPOWER

In Table 5.1 estimates of the demand for manpower in the four groups are presented and the data are taken from the data in Table 4.3 (b). From the method used in these estimates (as explained in Chapter 4) it can be deduced that, although not explicitly taken into account, the effects of technological innovation are provided for to the extent that structural changes due to such innovations are extrapolated.

TABLE 5.1

THE DEMAND FOR TECHNOLOGICAL MANPOWER

Occupational group		Demand for technological manpower		Average annual growth 1977 - 1987
		1977	1987	
Engineers	M	16000	21900	3,2
	F	60	110	5,7
Natural scientists	M	8000	12100	4,2
	F	1150	2440	7,9
Engineering technicians	M	41000	60000	3,9
	F	1290	2150	5,2
Artisans and apprentices	M	287200	358000	2,2
	F	8900	12300	3,3
Total	M	352200	452000	2,5
	F	11400	17000	4,1
Total labour force		5354424	7005000	2,7

The estimated growth rates in these occupations may not appear very high, but it must be remembered that the total demand is increasing at a rate of 2,7 % per annum if an average growth rate of 4,5 % in the GDP can be reached. Because the growth rate for demand in these occupations (with the exception of artisans and apprentices) is higher than the average, structural changes are still taking place. The estimated growth rate for women is appreciably higher than that for males. This is mainly due to small numbers in the base year so that small numerical increases result in large percentages. These growth rates are however an indication that women are being utilized in these occupations to a greater extent than in the past.

5.3 SUPPLY OF ENGINEERS

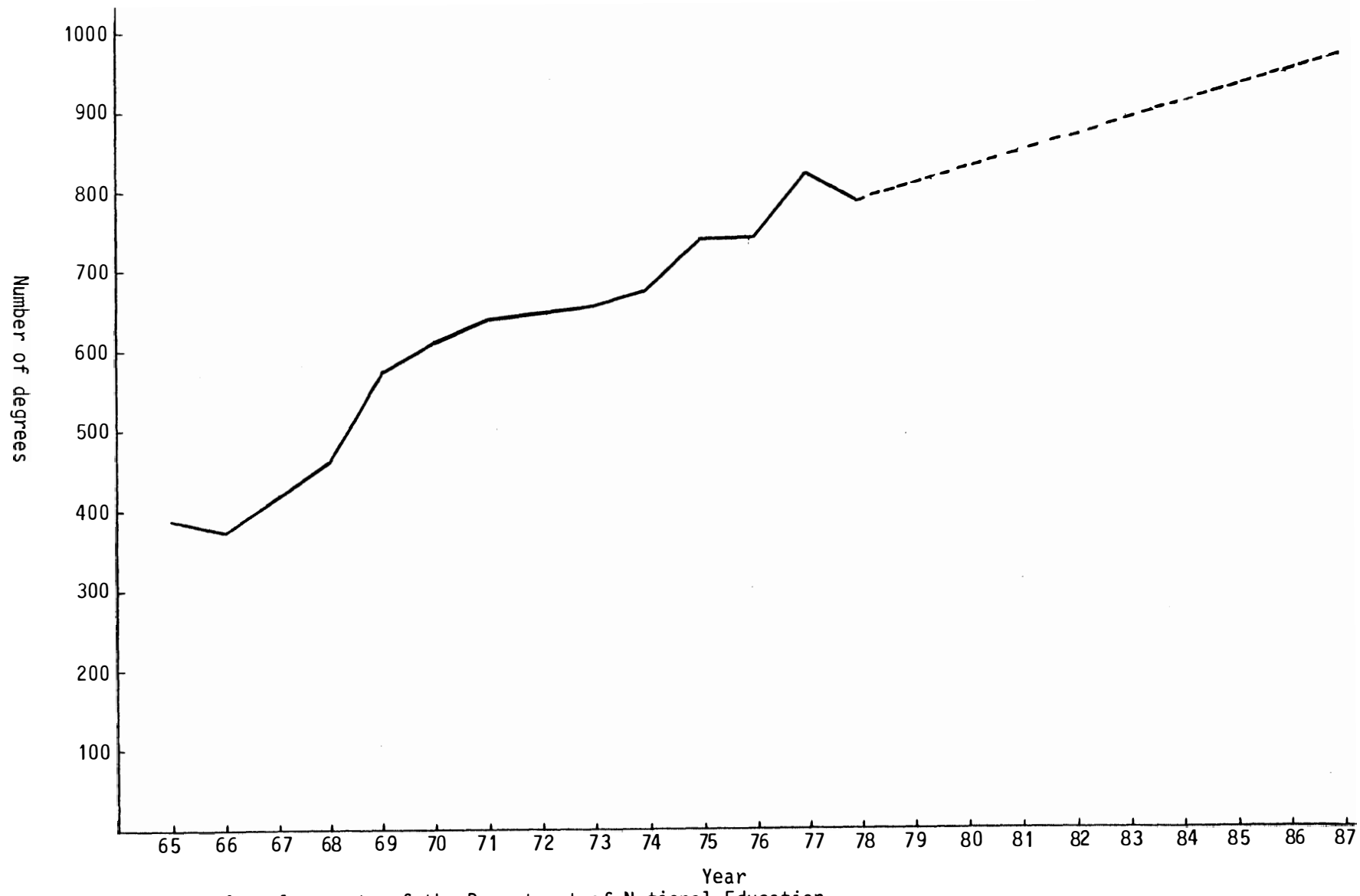
According to an estimate by SAIMAR (Van Pletzen 1981), about 13 000 engineers of the 1979 corps will still be active as engineers in 1987 after provision has been made for death, retirement and occupational shifts. Given a demand of 12 000 in 1987, this would mean that about 8 000 persons will have to join the engineering ranks during the period 1980 to 1987 or about 1 000 per annum.

Figure 5 shows the number of B-degrees in engineering obtained at South-African universities (1965 to 1978) as well as an extrapolation for the period 1980 to 1987. The projection shows that, should past trends continue, 1 000 degrees per annum will only be reached after 1987. It would therefore seem as if the demand target of 1 000 engineers per annum cannot be reached without the aid of immigration.

Taking the number of second-year students into account (Figure 6) it would furthermore seem as if even the trend projections are on the optimistic side and that the decline noticed from 1977 to 1987 (Figure 5) will continue for some time. During

FIGURE 5

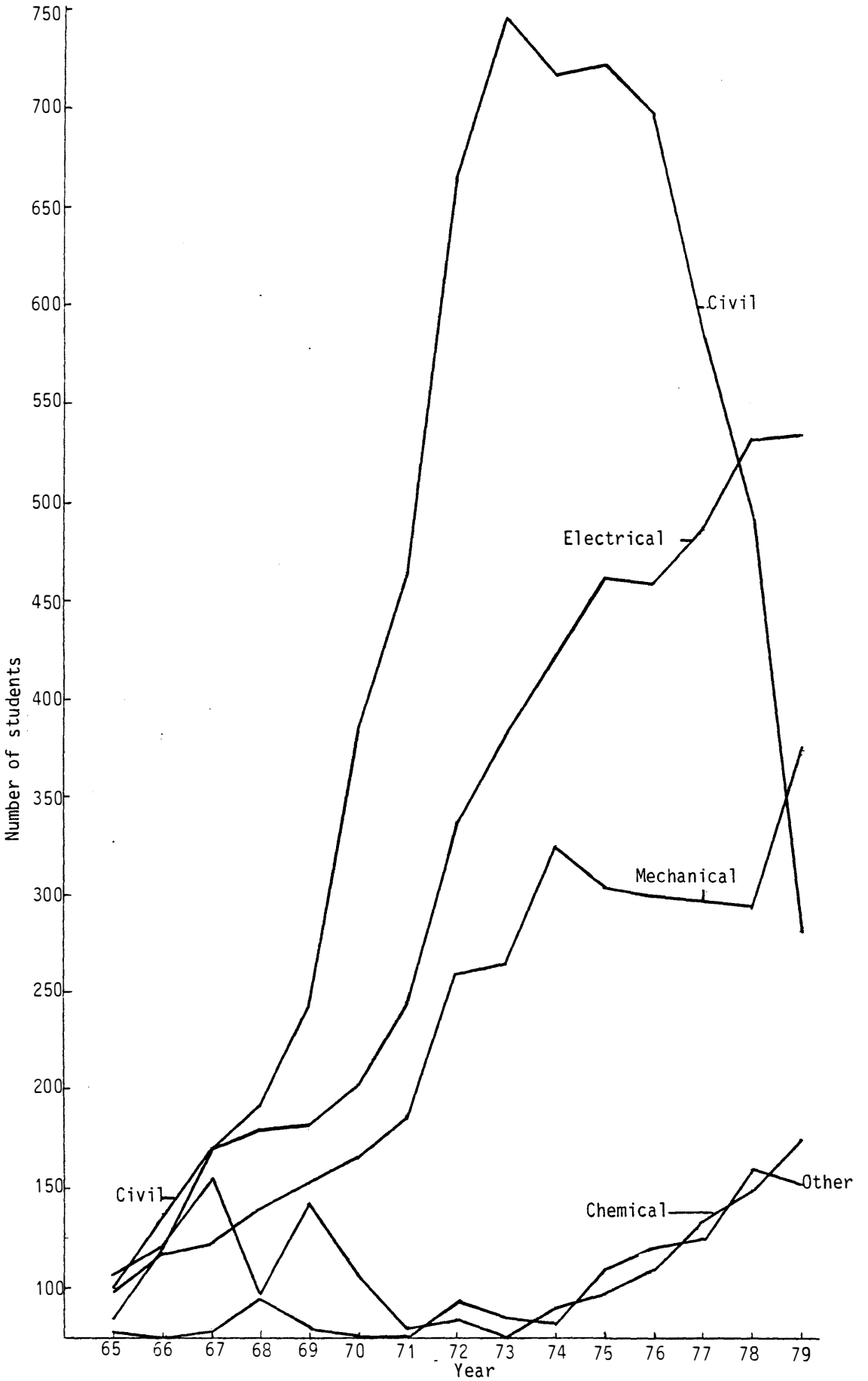
NUMBER OF B-DEGREES IN ENGINEERING OBTAINED AT SOUTH AFRICAN UNIVERSITIES 1965 to 1978



Source: Annual reports of the Department of National Education

FIGURE 6

NUMBER OF SECOND YEAR ENGINEERING STUDENTS, 1965 TO 1979 BY FIELD OF ENGINEERING



Source: Annual reports of the Departement of National Education

the latest recession the building and construction industry was hard-hit and this has infuenced the intake of students in the civil engineering field. It is known from the work of Freeman (1973) that students react to market forces and given the long training period, this reaction results in demand and supply of high-level manpower often being out of phase. Another factor which has influenced the intake of students is the availability of bursaries and loans from employers in times of recession.

Figure 6 shows that civil engineers are going to be in very short supply as measured against the long-term growth prospects, because the number of graduates are going to drop sharply from 1982 onwards. Because of the present high growth phase, the situation should improve from 1984 to 1985.

5.4 SUPPLY OF NATURAL SCIENTISTS, TECHNICIANS AND TRADESMEN

When is a person a natural scientist and when is he a technician? Problems with definitions make the available manpower statistics inaccurate. An analysis of the available statistics used in this report definitely shows that workers classified by employers as artisans, have not all completed an apprenticeship or passed a trade test. The available information also does not allow for the quantification of demand or supply as was the case with engineers. The manpower surveys supply only job titles and the employer must decide on the classification of his personnel. From advertise= ments in the press it is clear that a job title, for example a chemist, does not mean the same thing to all employers. Some employers would ask for a person with an M.Sc., others are satisfied with a National Diploma. It would, however, be reasonable to expect that a large proportion of the chemists, microbiologists, et cetera must be university trained for efficient functioning in the job.

5.4.1 *Natural scientists*

Table 5.1 shows that the demand for natural scientists is increasing at a rate higher than average and it is logical to expect that there must then also be an increa= se in the number of natural science graduates. Figure 7 shows the number of graduates with a B.Sc. and B.Sc. (Hons.) degree for the period 1965 to 1978.

The number of B.Sc. women graduates had shown an increasing trend especially since 1968. The same applies to B.Sc. (Hons.) graduates. The question arises as to whether the graduation trends could lead to the satisfaction of the demand as indicated in Table 5.1.

Table 5.2 shows the occupations in which persons with a general B.Sc. degree find themselves. This information has been tabulated from SAIMAR's 1979 salary survey. According to Table 5.2, 41 % of the economically active men and 37 % of the women find themselves in natural science occupations. The rest are in teaching and managerial

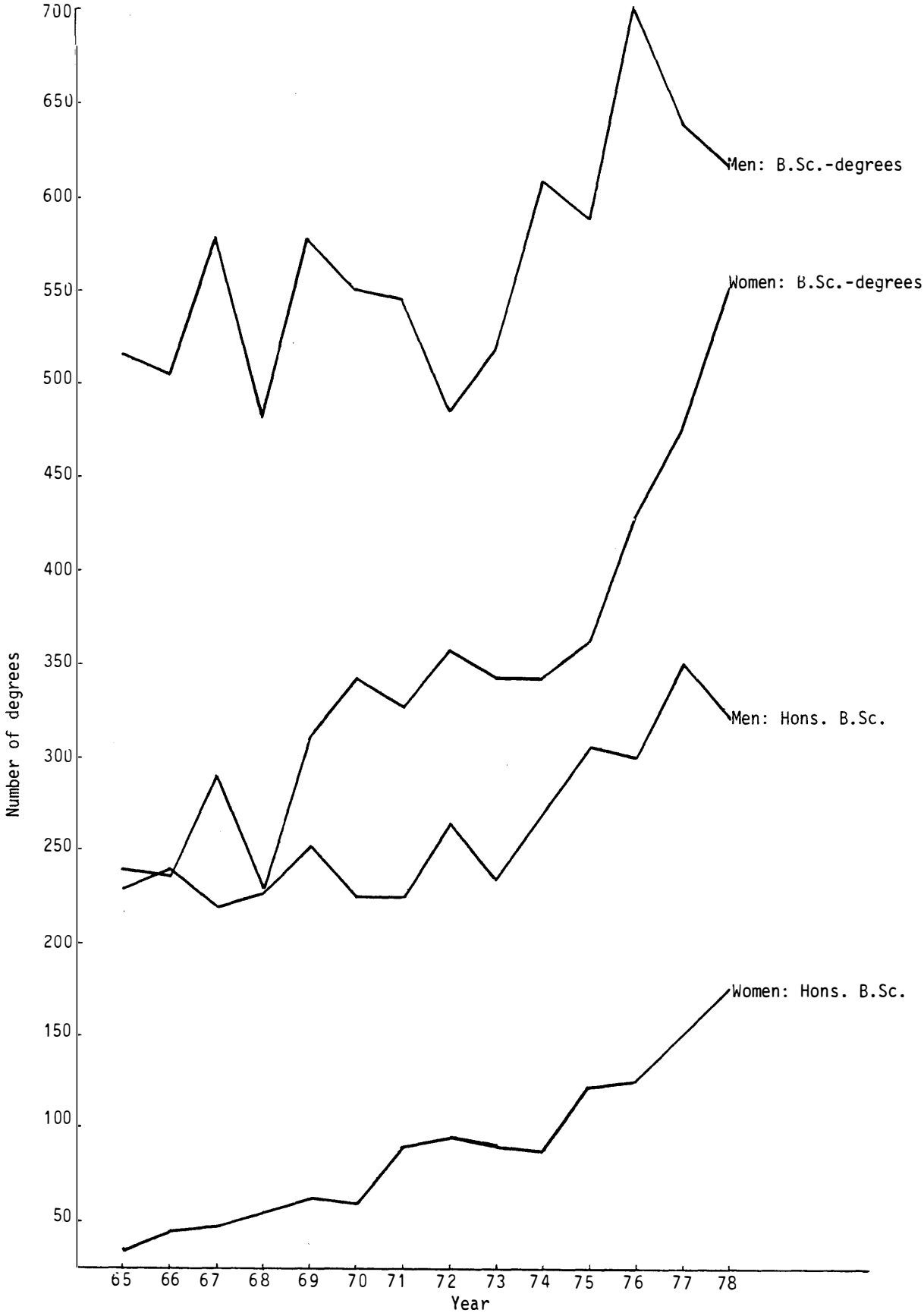
posts, et cetera, and the table for women shows that about 40 % are outside the labour market. The "loss" to other occupations is therefore large. Other erosion factors in any occupation are death and retirement and research has shown that, in most occupations, these factors result in a loss of about 2 % per annum.

According to Table 5.1 it is estimated that the demand for natural scientists in all fields will grow from 8 000 in 1977 to about 12 000 in 1987, or roughly by 400 per annum. To maintain a labour force of 8 000, about 160 workers will be needed annually. If it is assumed that no shift from other occupations will take place and that the occupational pattern of natural science graduates remains the same, about 1 000 persons must graduate annually to ensure a growth of 400 per annum in supply. To this must be added the 160 persons previously mentioned which gives a total of 1 160 graduates per annum. This is a very rough estimate. For a more accurate estimate the relative growth in other occupations where graduates in these fields find work, should be taken into account. The gap between needs and supply is however so large, that attempts at more accurate estimates would be a waste of time. Even if all the natural scientists are not all university graduates, the conclusion that an increasing shortage of male natural scientists can be expected, seems justified.

Female natural scientists find work mainly in the teaching professions. According to Table 5.1 the demand for female natural scientists will increase by 130 units per annum. The economic activity pattern for women is more complicated than the pattern for men (Figure 2 (b)). There is a tendency, especially among women with post-school qualifications, to return to the labour force when the youngest child goes to school. Calculations of losses are therefore not so simple. The activity rates for women are seldom higher than 50 %. Table 4.2 shows an activity rate of 60 %. This is probably too high because women outside the labour market seem disinclined to complete questionnaires and the response rate among working women is usually much higher. If it is assumed that the average activity rate for natural science women graduates is 50 %, the growth in demand would need about 260 graduates per annum for the period 1978 to 1981. If the rising trend in the production of graduates observed from 1975 onwards (which reached about 550 in 1978) were to continue, it would seem that women could partly compensate for the expected shortage in the case of men. The utilization of women in the natural science field, as in other fields, has its pitfalls. Of the total male survey group in Table 5.2, 60 % have a qualification of a B.Sc. (Hons.) or higher degree and 38 % have either a Master's or Doctor's degree. The percentages for women are 36 and 15 respectively. The possibility of substitution is, therefore, not at all completely elastic. The trend that more and more of the physical science, biology and mathematics teachers are women, will probably continue. The increase in the number of honours degrees could also indicate that women will be used more extensively in tertiary education than previously, because working conditions at these institutions suit the special circumstances of women. It can also be expected that the number of women used as technicians will increase.

FIGURE 7

NUMBER OF B.Sc. AND B.Sc. (Hons.) DEGREES CONFERRED AT UNIVERSITIES FOR WHITES
1965 to 1978



Source: Annual reports of The Department of National Education

TABLE 5.2

OCCUPATIONAL FIELD OF NATURAL SCIENCE GRADUATES

(a) Male

Highest qualification		Occupational field								
		National science occupations	Teaching occupations	Managerial and admin. occupations	Technical occupations	Other professional occupations	Sales occupations	Other occupations	Outside labour market	Total
B-degree	N	518	196	341	23	158	32	106	233	1607
	%	32,3	12,2	21,2	1,4	9,8	2,0	6,6	14,5	100
B.Hons-degree	N	371	181	91	9	79	4	33	82	850
	%	43,6	21,3	10,7	1,1	9,3	0,5	3,9	9,6	100
M-degree	N	297	223	83	3	68	1	15	66	756
	%	39,3	29,5	11,0	0,4	9,0	0,1	2,0	8,7	100
D-degree	N	264	334	66		32	2	6	77	781
	%	33,8	42,8	8,4		4,1	0,2	0,8	9,9	100
TOTAL	N	1450	934	581	35	337	39	160	458	3994
	%	36,3	23,4	14,5	0,9	8,4	1,0	4,0	11,5	100

(b) Female

B-degree	N	187	177	20	47	49	3	28	398	909
	%	20,5	19,5	2,2	5,2	5,4	0,3	3,1	43,8	100
B.Hons-degree	N	78	96	6	10	26		4	80	300
	%	26,0	32,0	2,0	3,3	8,7		1,3	26,7	100
M-degree	N	39	38	3		8		1	60	149
	%	26,2	25,5	2,0		5,4		0,7	40,2	100
D-degree	N	14	17			6			19	56
	%	25,0	30,4			10,7			33,9	100
TOTAL	N	318	328	29	57	89	3	33	557	1414
	%	22,5	23,2	2,0	4,0	6,4	0,2	2,3	39,4	100

Source: HSRC, SAIMAR Salary survey 1979

The substitution difficulties are also illustrated by the differences between men and women as far as the fields of study are concerned. Tables 5.3 and 5.4 give information in this regard. It would seem as if women have a special affinity for biological fields of study.

Tables 5.3 and 5.4 show that the percentage of males taking chemistry and physics is declining while the percentage taking earth sciences (mainly geology) is increasing. The percentage of women taking mathematics is relatively large and this is having an effect on the situation regarding computer personnel.

Taking the limited substitution possibilities into account and even accepting that the quantification presented is scant and imperfect, the conclusion that, at a growth rate of 4,5 % per annum in GDP, a real shortage of natural scientists can be expected and that chemists and physicists especially are going to be in short supply, seems justified.

5.4.2 *Technicians and artisans*

The situation for these two groups is analyzed together because research (Smit 1977) has shown that a large percentage of the workers regarded as technicians by employers, are recruited from the ranks of artisans. Only 10 % of a group of 5 900 technicians had obtained a National Diploma for Technicians (NDT) while 56 % had undergone training as artisans. Although the NDT is increasingly being regarded as the technician qualification, the practice to recruit technicians from artisan ranks will continue, especially in the private sector, for quite some time. It is also a general practice to register pupil technicians as apprentices. An analysis of the information contained in the manpower surveys of the Department of Manpower, shows that employers classify persons who are not qualified artisans, as artisans. This is especially true in the case of Non-Whites in certain artisan fields. Apparently quite a number of artisan aids are classified as artisans. Under the circumstances any attempt at the quantification of supply would be little better than thumb-sucking. It is, however, reasonable to expect that the growth in demand for artisans should be accompanied by a growth in the number of indentured apprentices. As shown in Table 5.1, it is expected that the demand for White artisans will increase at a rate of 2,2 % per annum. Table 5.5 shows the number of new apprentices indentured (1970 to 1978).

TABLE 5.3

STRUCTURE OF MAJOR SUBJECTS IN VARIOUS NATURAL SCIENCE FIELDS (B-DEGREES)

(a) Male

Field of major subject	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Chemistry	15,3	14,8	14,8	15,5	14,2	14,0	15,3	14,2	11,9	12,6	9,2	8,2	8,9	11,7
Physics	9,1	9,4	9,8	9,1	7,7	7,5	6,5	6,9	5,6	5,4	4,8	4,8	5,4	4,4
Mathematics	26,9	26,3	30,9	27,3	28,2	25,6	27,8	24,5	26,7	24,0	24,3	24,7	22,2	22,6
Biological sciences	15,8	18,6	16,4	17,6	21,7	22,8	21,5	24,8	24,4	27,5	28,1	30,1	26,5	23,2
Earth Sciences	16,4	14,8	16,3	18,2	14,9	15,5	18,4	17,5	22,8	21,5	20,9	20,9	23,4	21,1
Agriculture	16,4	16,2	12,0	12,4	13,3	14,6	10,4	12,0	8,6	9,0	12,6	11,3	13,6	17,0
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100
N	713	765	861	983	894	856	855	781	881	1083	1052	1239	1094	1109

(b) Female

Chemistry	12,1	11,8	11,7	10,5	10,6	8,7	10,2	10,0	7,3	10,0	7,8	6,2	7,0	6,5
Physics	3,7	3,6	1,8	2,3	2,0	2,5	3,1	3,0	2,6	2,4	2,7	3,5	2,8	2,4
Mathematics	21,8	29,6	29,7	31,6	26,9	27,9	30,5	30,5	32,3	30,5	34,1	32,5	33,1	30,2
Biological sciences	50,5	41,1	40,4	39,1	45,6	47,8	43,2	43,2	41,0	38,4	39,1	38,7	39,5	38,9
Earth Sciences	11,8	12,9	15,4	15,0	13,7	13,1	12,4	12,7	16,0	18,1	17,1	17,7	16,3	20,2
Agriculture	-	1,1	1,0	1,5	1,2	-	0,6	0,6	0,9	0,5	1,3	1,3	1,4	1,8
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100
N	321	365	384	399	502	519	482	498	586	757	713	834	871	941

Source: HSRC, SAIMAR, National Register of Natural and Social Scientists

TABLE 5.4

FIELD OF STUDY STRUCTURE OF B.Sc. (HONS)-DEGREES

(a) Male

Field	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Chemistry	21,2	24,8	22,6	17,9	22,2	16,7	16,0	12,9	11,2	6,1	7,7	9,3	8,4	8,5
Physics	11,0	8,1	9,4	11,6	8,6	6,9	6,1	6,7	3,2	5,1	5,3	6,7	7,5	5,6
Mathematics	10,1	10,6	13,7	16,5	13,9	14,4	17,9	19,6	16,5	17,6	13,7	16,6	14,7	12,9
Biological sciences	19,4	18,6	19,8	19,6	21,2	20,8	30,5	26,8	26,5	24,4	28,4	27,5	25,7	27,3
Earth Sciences	13,8	11,2	14,6	13,4	19,9	27,8	19,1	23,4	27,3	31,4	24,9	23,6	23,1	27,6
Agriculture	24,4	26,7	19,8	21,0	14,3	13,4	10,3	10,5	15,3	15,4	20,0	16,3	20,7	18,2
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100
N	217	161	212	224	266	216	262	209	249	312	285	313	334	319

(b) Female

Chemistry	15,0	13,0	9,5	12,5	14,6	7,1	7,4	8,1	5,3	14,1	6,1	9,7	8,0	9,8
Physics	-	-	2,4	2,1	4,9	1,8	1,5	1,6	3,9	2,2	2,0	3,2	5,1	5,4
Mathematics	30,0	-	23,8	29,2	7,3	25,0	19,1	27,4	19,7	18,5	15,3	24,2	21,7	23,9
Biological sciences	45,0	78,3	54,8	47,9	56,1	57,1	51,5	54,8	55,3	47,8	60,2	53,2	44,9	46,2
Earth Sciences	10,0	8,7	9,5	8,3	17,1	8,9	19,1	8,1	13,2	16,3	14,3	9,7	18,8	12,0
Agriculture	-	-	-	-	-	-	1,5	-	2,6	1,1	2,0	-	1,4	2,7
TOTAL	100	100	100	100	100	100	100	100	100	100	100	100	100	100
N	20	23	42	48	41	56	68	62	76	92	98	124	138	184

Source: HSRC, SAIMAR, National Register of Natural and Social Scientists

TABLE 5.5

NUMBER OF NEW WHITE INDENTURED APPRENTICES

Year	Field of trade			
	Metal and engineering	Electro= technical	Motor	Building
1970	3 347	1 370	1 847	771
1971	3 506	1 523	1 892	857
1972	3 935	1 567	894	842
1973	3 969	1 870	2 100	631
1974	4 090	1 846	1 675	732
1975	4 359	2 233	1 501	601
1976	4 353	2 119	1 801	522
1977	4 381	2 190	1 889	776
1978	3 453	1 513	1 153	508

Source: Dept. of Manpower Utilization

According to Table 5.5 there is no apparent trend in most of the artisan fields. The number of apprentices in the electrotechnical field did increase up to 1975, but since then no clear trend has been visible. The dropout rate among appren= tices is high. Of the new indentured apprentices of 1971, 63 % obtained artisan status, 14,3 % cancelled their contracts and 21,4 % simply disappeared (Terblanche 1980(a)). Privision must also be made for erosion in artisan ranks due to death, retirement and movement to other occupations.

As is the case with artisans, we would expect the number of diplomas for technicians to keep up with the rising demand for technicians. Table 5.6 shows the number of diplomas and certificates in engineering awarded by the Department of National Education from 1976 to 1980. Since the introduction of the trimester courses, certificates and diplomas have not been classified according to field of engineering. Available information suggests that with the transition of semester to trimester courses, a "once only" increase in diplomas and certificates occurred. Table 5.6, therefore, only contains information for the period 1976 to 1980.

TABLE 5.6

NUMBER OF NATIONAL DIPLOMAS AND CERTIFICATES FOR TECHNICIANS AWARDED 1976 TO 1980

	1976	1977	1978	1979	1980
Diplomas	753	767	667	628	633
Certificates	642	680	736	701	700

Again the story repeats itself. The number of certificates remains reasonably constant and a decline in the number of diplomas awarded is noticeable.

5.5 THE POTENTIAL OF THE TRADITIONAL SOURCE OF TECHNOLOGICAL MANPOWER

The general picture obtained from the previous paragraphs is one of insufficient supply and increasing shortages can be expected in the future. This situation holds no good for the economic growth target set in the EDP. This conclusion is nothing new, and in the past very much the same things were said. Except for a few recession periods the South African economy has grown at a reasonable rate. Structural changes, in other words shifts in the occupational structure, the more extensive utilization of women and a positive immigration rate have all worked together to alleviate the situation. The aim of this specific paragraph is to supply further background information so that the estimates presented earlier in this chapter, can be placed in better perspective.

Up to date the main source of technological manpower has been the White male component of the labour force. If future manpower needs are going to be satisfied to the same extent from this component, the White male labour force must either grow at the same rate as demand, or structural changes will have to take place at a faster rate. The male component of the labour force is mainly supplemented by persons from the age groups 15 to 19 and 20 to 24 years who have become economically active. Because of the long history of compulsory education for Whites and the two-year period of National Service, one can expect that, on the short term, there should be a high correlation between the growth in the labour force and the number of new workers which must compensate for both the growth in demand and losses due to death and retirement.

Table 5.7 gives a projection of the size of the age groups 15 to 19 and 20 to 24 years in the populations for the period 1980 to 2000 (Van Tonder 1980).

TABLE 5.7

PROJECTION OF THE NUMBER OF 15 TO 19 AND 20 TO 24 YEAR OLD WHITE MALES

	1980	1985	1990	1995	2000
Age group 15 to 19	205 600	215 000	219 400	195 600	194 900
Growth rate		0,9	0,4	-2,3	-0.1
20 to 24	195 700	203 900	213 300	217 800	194 300
Growth rate		0,8	0,9	0,4	-2,3

Source: HSRC, SAISDCR

- The growth rate in both age groups is below 1 % and becoming negative.
- The population growth rate is well below the demand rates shown in Table 1.
- These growth rates have far-reaching implications for the supply of manpower.

Table 5.7 clearly shows that the growth in this source is decreasing and the birthrate has declined to such an extent that even a decrease in absolute members can be expected in the 1990s. It can therefore be expected that the age structure of the male labour force is going to change and that losses due to death and retirement are going to increase in due course. The number of males going to universities or technikons will depend on the size of unutilized potential and wage levels, but can hardly show an increase due to population growth. The total number of White teachers and university lecturers can be expected to stabilize , which can have an influence on other occupational fields.

The engineers, natural scientists and technicians are drawn from those who usually take mathematics and natural science as school subjects. Matriculation exemption is necessary for engineers and natural scientists, and research (Smit 1976) has shown that the National Diploma for Technicians can hardly be obtained by the low achiever in mathematics and science.

Table 5.8 shows the number of White matriculants with mathematics and science at higher grade for the period 1974 to 1978.

TABLE 5.8

NUMBER OF WHITE MATRICULANTS AND NUMBER WHO PASSED MATHS IN THE HIGHER GRADE

	1974	1975	1976	1977	1978
Male	8667 (81,1)*	8022 (72,5)	7518 (72,4)	8760 (76,8)	8634 (77,8)
Female	5616 (58,2)	4780 (47,4)	4583 (47,9)	6228 (60,9)	6196 (59,5)
Total matriculants M	10687	11065	10385	11407	11101
Total matriculants F	9654	10080	9572	10230	10421

* As percentage of the number of matriculants

Source: HSRC, SAIER

- Again no clear upward trend. The number of matriculants with mathematics in 1978 is slightly less than the number in 1974.

There is no indication of a rising trend among male students although the number of female students taking mathematics, seems to increase. Various fields of study draw from this group of matriculants and Table 5.9 gives an indication of the fields of study in which a group of Standard Ten pupils (1969) eventually received B-degrees.

Looking solely at the achievement in mathematics and science, there seems to be an "unutilized" potential for technological manpower. In the mobilization of this potential, interests and aptitudes will have to be taken into account. As an example it can be mentioned that in the applied human sciences field, most of the males obtained their degrees either in music or theology.

TABLE 5.9

PERCENTAGE OF WHITE GRADUATES (B-DEGREE OR DIPLOMA) WITH HIGH ACHIEVEMENT IN MATHEMATICS AND PHYSICAL SCIENCE IN STD 10

(a) Male

B-degree	N	% with Mathematics in Std 10	% with Physical Science in Std 10	% with > 60 % in Mathematics	% with> 60 % in Physical Science	% with > 60 % in total Std 10 marks	% with superior IQ (120+)
Engineering	553	100	90	83	87	77	57
Medical and paramedical	455	100	92	67	83	75	49
Natural science	362	100	89	48	64	49	46
Applied natural science	435	100	86	39	49	37	36
Law	343	95	79	29	43	43	40
Commerce and administration	784	99	84	36	41	37	39
Human science	516	86	73	24	35	32	35
Applied human science	237	83	75	34	43	41	40

(b) Female

Medical and paramedical	217	96	74	63	78	76	58
Natural science	247	98	80	72	79	79	73
Applied natural science	60	91	73	45	57	68	61
Commerce and administration	98	95	53	63	60	71	55
Human science	684	72	37	33	44	59	50
Applied human science	317	73	41	29	38	46	41
Diploma							
NDT-diplomas in engineering or natural science	499	97	91	16	26	15	25
Teaching diplomas (Male)	531	64	52	5	13	11	11
(Female	2328	40	19	15	20	28	23

Source: HSRC, SAIMAR, Project Talent Survey

Table 5.9 also shows that engineering, medicine and to a lesser extent natural science, are already creaming the top. A balanced economy cannot be built on technological manpower alone and people with a high achievement level are also necessary in other fields.

Wages play an important role in the allocation of labour in a free market system. The discounted expected lifetime incomes in various occupational fields based on the incomes of 1979, are shown in Table 5.10. The drawing power of the non= technical fields with a high earning power cannot be ignored and will have a definite effect on any attempts to change the present structure.

Given the limited size and low growth rate of the traditional source of technological manpower and a strong demand in other occupations, the demand for technological manpower cannot be met from its traditional source.

CHAPTER 6
REVIEW AND CONCLUSIONS

6.1 INTRODUCTION

This study has shown that manpower planning is necessary for the efficient functioning of an organization. The manpower planning function has several components of which estimates of the future manpower needs of the organization are an important part. These estimates will help in the formulation of the strategy the organization is going to adopt (recruitment, selection, placement, training) to fulfil its man= power needs. Without knowledge of the external manpower situation the strategy can hardly be sensibly formulated or evaluated. Obtaining knowledge of the external situation forms part of the planning process, but this knowledge is not readily available. The aim of this research is to collect the available information and supply a manpower picture which is as integrated as the information allows it to be.

6.2 REVIEW AND IMPLICATIONS OF THE RESULTS

In this chapter little attention will be given to detail. Where necessary for discussion, information that was not previously used will be presented to elucidate matters.

The results underline the two main manpower problems which are in a certain sense contradictory, but definitely interrelated, namely a critical shortage of skill= ed manpower and a lack of job opportunities. These conclusions are nothing new and it would be understandable if organizations were to react with a shrug of the shoulders. One would also have to agree that the RSA has, as recently as 1980, reached one of its highest growth rates ever and that companies have shown bumper profits. This may cause a line of reasoning that manpower planning is, therefore, unnecessary and a waste of time. This attitude shows a total lack of insight into the magnitude of the manpower problems which will have to be faced during the eighties.

The lack of job opportunities (increasing by about 100 000 per annum for the estimated period) is reaching such a magnitude that a high growth rate is necessary. The result of the investigation show that the training rate in most of the occupations in which demand is increasing at an above average rate, is not keeping up with the demand and that ability to grow will be hampered by the shortage of skilled manpower.

In the past it was general practice to elevate Whites to higher positions and then to move Non-Whites into this "vacuum". This practice can no longer continue because the percentage of White males in occupations which could be classified as high-level, has already reached 31,5 % as against the 26,5 % for the USA (ILO, Year= book of Labour Statistics 1980). The possibility that Whites may be promoted to

positions in which they cannot function efficiently, is real. The general shortages and the resulting strong demand also result in a maldistribution of talents and ability. The maldistribution affects the public sector more than the private sector because the former cannot react as quickly to differentials in demand. Furthermore, the influence of strong demand on wage inflation and the resulting detrimental effects are well-known and need no elaboration.

The long-term solution to the problem lies in the utilization of the ability of the total South African population and the acceptance of a vigorous family planning programme by all concerned. Except for some of the oil rich countries, no country could make any real progress in increasing the living standards of its population with population growth rates in the region of 3 % per annum.

The new labour legislation has already removed most of the legal barriers in the way of full utilization. This does not, however, mean that greater utilization of all population groups is going to be easy. Some of the obstacles are:

(a) A trained but unutilized Non-White labour force does not exist.

(b) The large-scale training and utilization of especially Blacks in an industrial society, is not a simple matter.

(c) The minority report of the first part of the Commission of Enquiry into Labour Legislation, points towards a tendency for Whites to protect their bargaining position (Republic of South Africa 1979).

(d) Intergroup relations in general are not as good as they should be. Research (Lotz 1977) has shown that the potential for conflict is present, especially between Black and White on the shop floor.

(e) Wildcat strikes and damage to property, giving expression to the militant mood of many Black workers, could influence the employment practices of employers.

The above list is not exhaustive and can easily be added to, but it suffices to illustrate that the personnel departments have a difficult task ahead. To induce workers to accept new policies, which in many cases also entail changes in established values and norms, is far from simple. If workers can be assured that the changes are born of necessity, this task could perhaps become a little less hazardous. To prove this, knowledge of the general manpower situation is necessary.

It is not only because of numbers that employers will have to give more attention to career opportunities for Blacks, but also because of rising aspirations

and expectations. The research of Lotz (1977) has shown that work and companies which offer little opportunity for advancement, are becoming more unpopular.

In (a) it has been stated that there is no trained but unutilized Non-White labour force available. Training is therefore important, but the question arises as to whether the foundation for such training laid by a certain level of formal education, is present. Figures 8 to 10 give the enrolment in educational institutions at secon= dary and tertiary level.

The conclusion drawn from these figures is that the education systems are producing large numbers of Non-Whites who have received some secondary education and that the level of education of the young Black labour force will increase rapidly. This should facilitate training but there are certain factors which can influence the trainability.

Except for the influence of cultural factors, the standard of education in mathematics and science could pose a problem. The situation in KwaZulu (Terblanche and Ehlers 1980) where only 25 teachers with a B.Sc. degree (all fields) were available for 122 000 secondary pupils, illustrates the problem and this could have an influence on the trainability of school leavers in technological fields.

6.3 RECOMMENDATIONS

The recommendations which flow from the results are divided into two sections. The first section mainly deals with steps to be taken by individual organizations and the second is aimed at the government and research sectors.

6.3.1 *Recommendations aimed at individual organizations*

Because the manpower situation differs from organization to organization, the plans for overcoming manpower problems will also differ, but what is recommended ought to be relevant for most organizations.

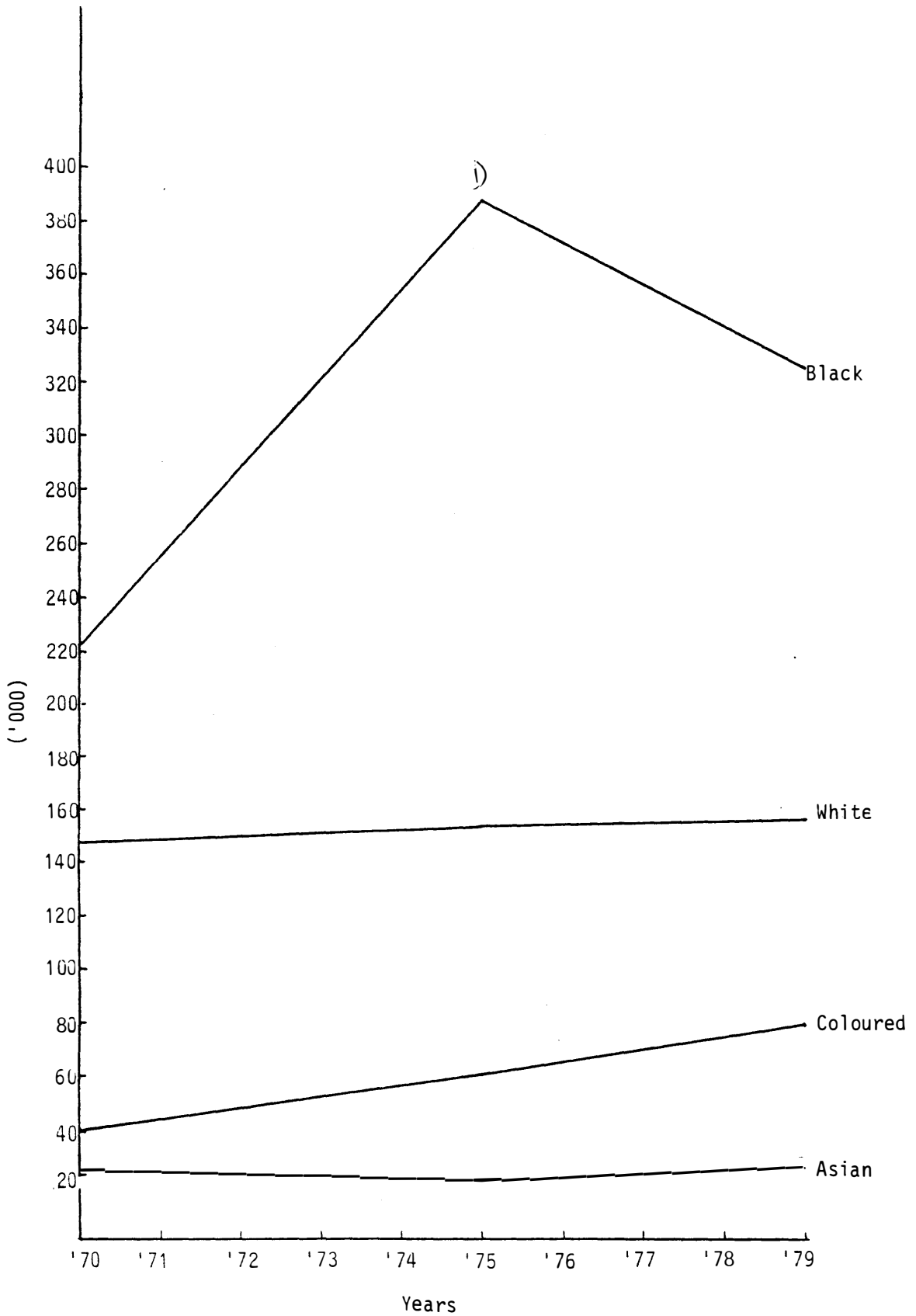
(a) Employers of high-level manpower, for example engineers, should not pay too much attention to economic cycles and employers who can afford it, should not curtail bursaries or loans in times of recession.

(b) The utilization of high-level manpower in an organization must be examined carefully. Studies by the HSRC (Ebersohn 1975) has indicated that there is scope for improvement in this regard. Trained manpower is a scarce resource and should be used accordingly.

(c) Workers should be informed of the general manpower situation so that

FIGURE 8

ENROLMENT STD 6 AND 7



1) Decline due to the omission of information for the Republics of Transkei and Bophuthatswana after their independence

FIGURE 9

ENROLMENT STD 8, 9 AND 10

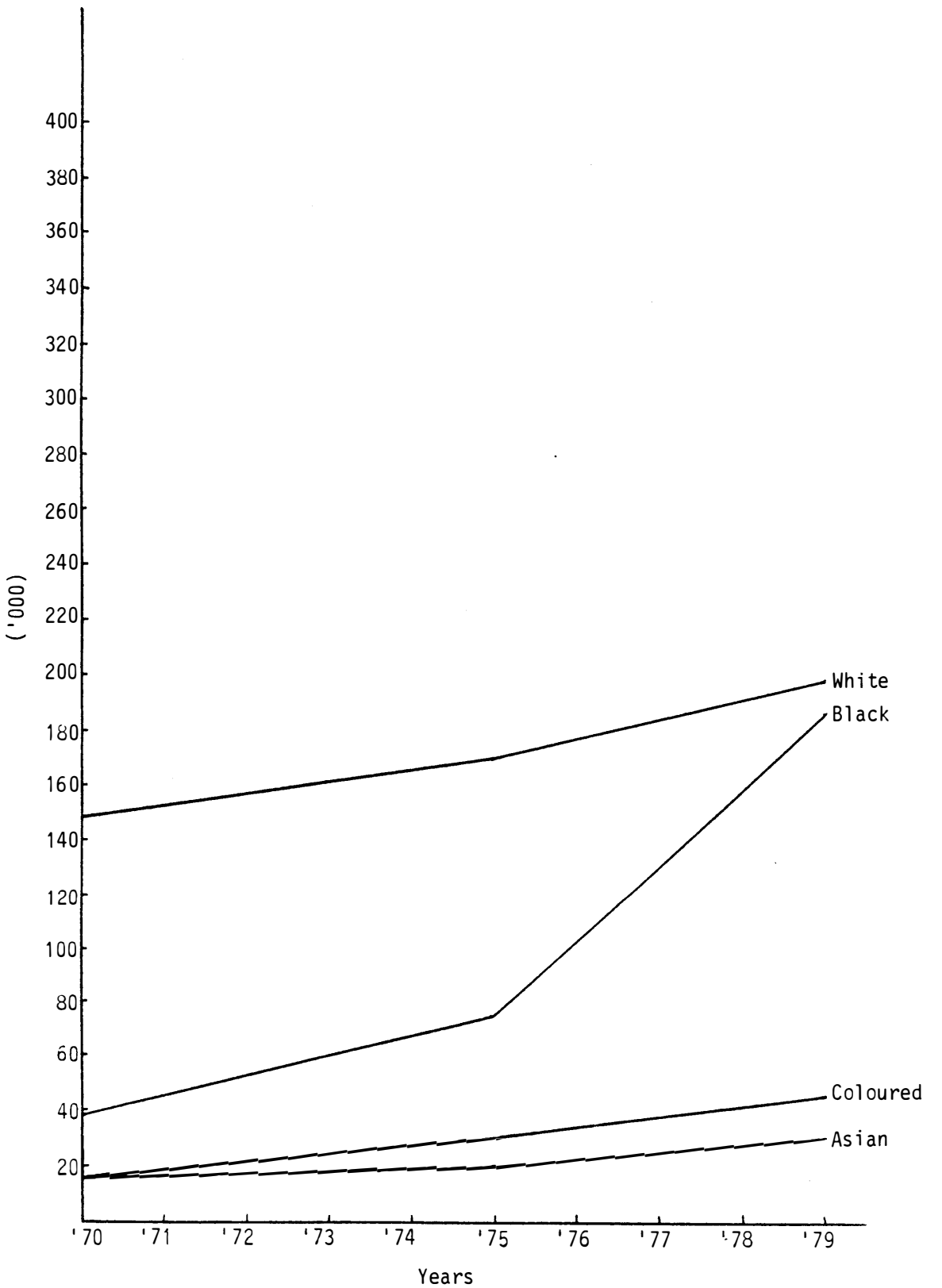
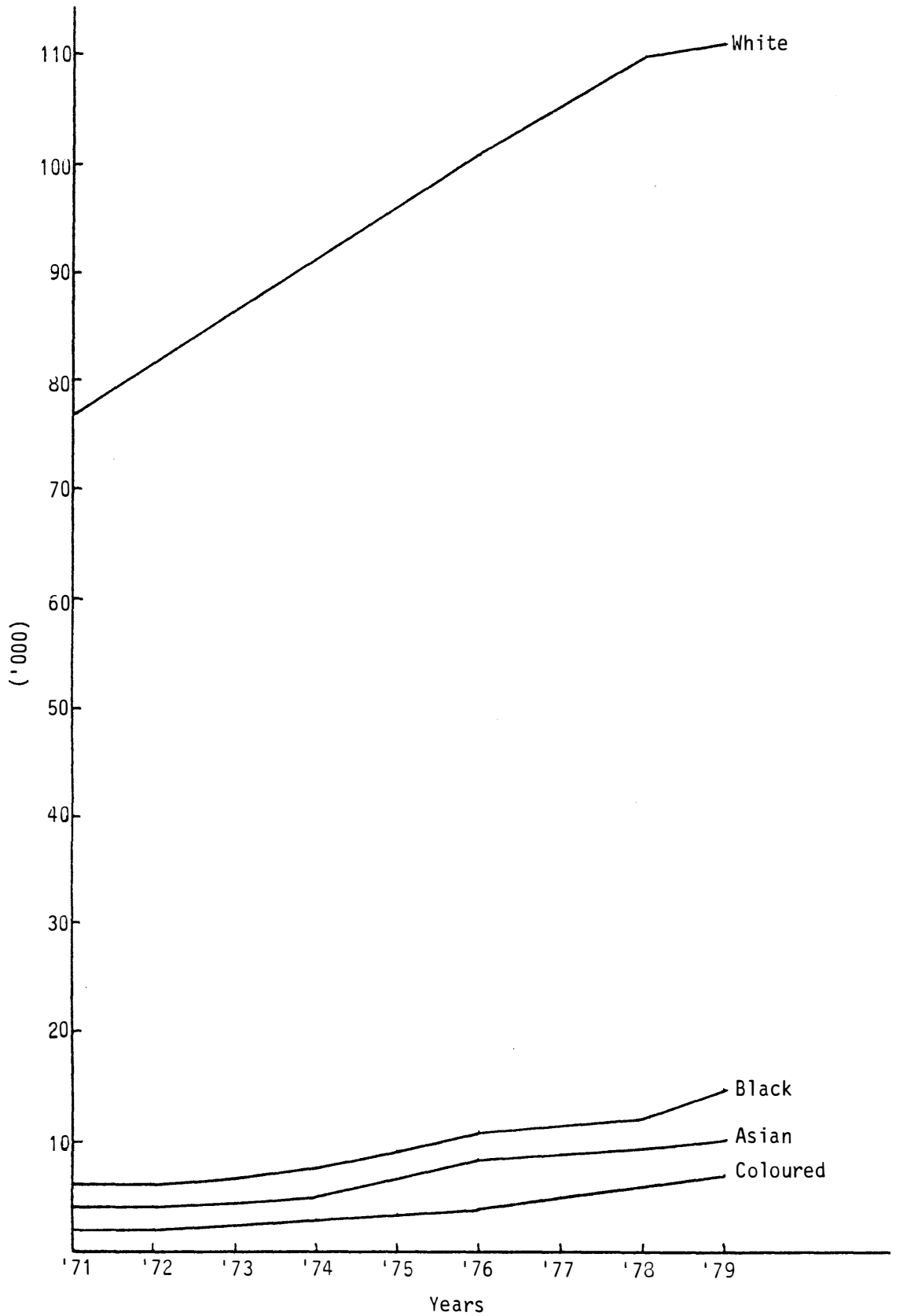


FIGURE 10
ENROLMENT AT UNIVERSITIES



they can understand the implications of this situation for the organization.

(d) Training of personnel is a priority and this aspect has been stressed by many sources. The recruitment of trained immigrants should still be considered.

(e) Manpower planning is necessary and should form part of the total planning function of the organization.

6.3.2 *Recommendations aimed at the government and research sectors*

(a) Knowledge of the general external manpower situation is an indispensable component of manpower planning. If all the individual organizations were to compile their own data on the subject, unnecessary duplication would result and already scarce manpower would be wasted. A regular review of the situation by an organization such as SAIMAR is therefore necessary.

(b) The methodology used in this study is open to serious criticism. One of the most important points would be the sensitivity of the demand for labour for a certain target growth rate (Ahamad and Blaug 1973, Goankar 1975). Although this study does not attempt to forecast a certain reality, the criticism remains valid. Continued research on demand functions, and the relationships between economic activity and the generated demand for labour, is therefore necessary. The arbitrary nature of many assumptions dealing with the supply of labour has been pointed out in Chapter 3. The 1980 population census will supply further information in this regard and it also underlines the necessity of a mini-census in the years midway between the full population censuses, as well as the expansion of the CPS to include Asians.

(c) This study gives no indication of possible regional differences in the labour market situation. Because organizations operate in a certain region, macro studies should include regional labour market information. The compilation of regional labour market statistics is also a priority.

(d) Most of the above recommendations are aimed at the problem of manpower shortages. The lack of employment opportunities is an even more serious problem. It has been shown that the formal sector of the economy cannot create enough job opportunities to absorb the large numbers coming into the labour market and every avenue of approach in this regard will have to be examined.

(i) The possible use of a labour intensive technology in infrastructure creation, especially in the National states, should be investigated.

(ii) Research aimed at the development of labour intensive techniques as well as methods of management, is necessary.

(iii) The informal sector of the economy should be stimulated by selectively removing rules and regulations more suitable for industrialized countries.

(iv) The unemployment problem has its roots in an unacceptably high popu= lation growth rate. The active support of all people in leading positions for family planning is necessary.

6.4 CONCLUDING REMARK

The results of this study have brought very little new information to light. What the results underline, however, is the exponential nature of the changes. In other words, the rates of change are increasing. This means that the time span availa= ble for finding solutions and adapting to changing circumstances, is shrinking.

APPENDIX

ECONOMIC SECTOR : (1)GOLD MINES

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.01	0.01	23
2 ENGINEERS, ETC.	0.06	0.06	0.13	0.20	0.12	0.09	0.10	0.09	0.10	423
3 SURVEYORS	0.20	0.21	0.05	0.04	0.18	0.22	0.24	0.20	0.25	1058
4 NATURAL SCIENTISTS	0.01	0.02	0.02	0.07	0.07	0.04	0.02	0.05	0.05	207
5 MEDICAL DOCTORS ETC.	0.02	0.02	0.02	0.02	0.02	0.03	0.0	0.00	0.00	11
6 NURSES & MIDWIVES	0.18	0.23	0.23	0.26	0.21	0.33	0.07	0.04	0.08	346
7 OTHER PARAMEDICAL WORKERS	0.00	0.00	0.01	0.02	0.03	0.04	0.01	0.01	0.03	119
8 ENGINEERING TECHNICIANS	0.21	0.22	0.10	0.13	0.12	0.10	0.05	0.15	0.08	327
9 OTHER TECHNICIANS	0.10	0.10	0.17	0.14	0.09	0.06	0.05	0.16	0.07	294
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.01	0.00	0.00	0.0	0.00	0.00	18
11 TEACHERS, ETC.	0.0	0.00	0.05	0.06	0.05	0.05	0.06	0.10	0.10	404
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.01	0.01	0.11	0.12	0.11	0.10	0.11	0.18	0.17	690
14 MANAGERIAL,WORKERS ETC.	0.07	0.08	0.17	0.23	0.24	0.25	0.24	0.26	0.27	1129
15 CLERICAL WORKERS	3.01	2.37	2.15	2.86	2.67	3.01	5.28	2.93	4.37	18198
16 SALES WORKERS	0.0	0.0	0.0	0.03	0.00	0.00	0.0	0.01	0.01	27
17 TRANSPORT WORKERS	1.95	2.26	2.92	2.47	3.30	3.69	0.09	0.10	0.57	2377
18 SERVICE WORKERS	3.58	4.22	3.43	3.80	3.65	4.23	0.43	1.90	1.12	4643
19 PRODUCTION WORKERS	88.35	87.81	88.17	87.24	87.07	85.08	90.51	90.32	89.33	371685
20 FOREMEN AND SUPERVISORS	0.00	0.00	0.01	0.02	0.03	0.02	0.04	0.13	0.10	431
21 ARTISANS AND APPRENTICES	2.24	2.25	2.27	2.12	1.96	2.54	2.67	2.32	2.62	10911
22 LABOURERS	0.0	0.12	0.01	0.17	0.05	0.11	0.02	1.04	0.67	2777
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	416100

ECONOMIC SECTOR : (2)COAL MINES

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
2 ENGINEERS, ETC.	0.06	0.07	0.11	0.11	0.09	0.14	0.12	0.08	0.13	154
3 SURVEYORS	0.19	0.19	0.08	0.25	0.28	0.31	0.33	0.37	0.41	503
4 NATURAL SCIENTISTS	0.01	0.02	0.01	0.03	0.23	0.07	0.01	0.01	0.05	67
5 MEDICAL DOCTORS ETC.	0.02	0.02	0.01	0.02	0.01	0.00	0.00	0.0	0.0	0
6 NURSES & MIDWIVES	0.15	0.24	0.24	0.20	0.21	0.54	0.07	0.01	0.15	183
7 OTHER PARAMEDICAL WORKERS	0.00	0.0	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.09	0.06	0.00	0.00	0.05	0.04	0.01	0.09	0.04	51
9 OTHER TECHNICIANS	0.02	0.02	0.05	0.06	0.06	0.0	0.03	0.07	0.05	56
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
11 TEACHERS, ETC.	0.00	0.0	0.00	0.00	0.01	0.0	0.05	0.04	0.04	54
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.04	0.04	0.05	0.11	0.12	0.10	0.13	0.25	0.24	292
14 MANAGERIAL WORKERS ETC.	0.23	0.35	0.35	0.38	0.43	0.62	0.63	0.64	0.75	920
15 CLERICAL WORKERS	1.98	2.28	2.05	1.86	2.34	2.77	1.49	4.36	3.44	4216
16 SALES WORKERS	0.01	0.0	0.0	0.0	0.00	0.0	0.01	0.0	0.00	6
17 TRANSPORT WORKERS	0.89	0.66	1.45	0.80	1.20	1.56	0.38	0.24	0.47	573
18 SERVICE WORKERS	5.25	3.22	3.00	1.60	2.62	5.43	0.35	3.26	2.25	2751
19 PRODUCTION WORKERS	88.21	89.25	87.91	81.25	88.12	82.37	91.90	84.22	85.52	104759
20 FOREMEN AND SUPERVISORS	0.05	0.07	0.02	0.63	0.52	0.0	0.04	0.09	0.07	80
21 ARTISANS AND APPRENTICES	2.27	2.39	2.58	3.32	3.31	4.16	4.35	6.01	6.15	7539
22 LABOURERS	0.54	1.12	2.09	9.36	0.39	1.87	0.10	0.27	0.24	294
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	122500

ECONOMIC SECTOR : (3)OTHER MINES

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00	3
2 ENGINEERS, ETC.	0.18	0.20	0.22	0.24	0.21	0.30	0.18	0.29	0.27	676
3 SURVEYORS	0.10	0.16	0.15	0.16	0.23	0.23	0.32	0.17	0.27	662
4 NATURAL SCIENTISTS	0.16	0.21	0.22	0.29	0.33	0.51	0.24	0.27	0.37	924
5 MEDICAL DOCTORS ETC.	0.04	0.03	0.04	0.04	0.04	0.02	0.03	0.03	0.02	55
6 NURSES & MIDWIVES	0.11	0.12	0.19	0.19	0.31	0.14	0.17	0.24	0.22	552
7 OTHER PARAMEDICAL WORKERS	0.01	0.01	0.01	0.02	0.01	0.03	0.01	0.03	0.03	74
8 ENGINEERING TECHNICIANS	0.05	0.07	0.07	0.12	0.09	0.20	0.10	0.15	0.18	445
9 OTHER TECHNICIANS	0.27	0.08	0.12	0.22	0.23	0.24	0.23	0.22	0.27	667
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.00	0.00	0.00	0.01	0.00	0.00	0.01	13
11 TEACHERS, ETC.	0.01	0.02	0.03	0.07	0.06	0.04	0.06	0.02	0.05	129
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.04	0.08	0.11	0.18	0.18	0.19	0.19	0.38	0.36	904
14 MANAGERIAL WORKERS ETC.	0.71	0.58	0.58	0.46	0.40	0.83	0.68	0.69	0.76	1886
15 CLERICAL WORKERS	2.44	2.37	2.59	2.58	2.80	3.14	3.14	3.62	3.67	9144
16 SALES WORKERS	0.06	0.05	0.13	0.20	0.12	0.14	0.17	0.32	0.29	723
17 TRANSPORT WORKERS	2.38	2.27	3.28	2.76	3.03	3.76	3.09	4.17	4.18	10418
18 SERVICE WORKERS	2.50	1.78	3.01	2.73	2.89	3.02	2.15	2.81	2.73	6804
19 PRODUCTION WORKERS	62.77	51.31	60.71	65.07	72.53	55.82	68.75	62.20	64.92	161840
20 FOREMEN AND SUPERVISORS	1.24	0.46	0.44	0.57	1.17	1.38	1.04	4.25	3.29	8192
21 ARTISANS AND APPRENTICES	2.49	3.31	2.96	3.19	3.54	2.87	3.27	3.45	3.32	8271
22 LABOURERS	24.43	36.93	25.13	20.86	11.82	27.14	16.19	16.69	14.81	36919
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	249200

ECONOMIC SECTOR : (4)FOOD INDUSTRY

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.00	3
2 ENGINEERS, ETC.	0.17	0.17	0.19	0.21	0.19	0.22	0.19	0.16	0.20	403
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.12	0.11	0.14	0.13	0.19	0.23	0.22	0.21	0.25	517
5 MEDICAL DOCTORS ETC.	0.02	0.02	0.02	0.02	0.03	0.01	0.02	0.02	0.02	33
6 NURSES & MIDWIVES	0.04	0.03	0.03	0.08	0.06	0.06	0.08	0.10	0.10	206
7 OTHER PARAMEDICAL WORKERS	0.04	0.04	0.03	0.03	0.06	0.05	0.06	0.10	0.09	189
8 ENGINEERING TECHNICIANS	0.04	0.05	0.05	0.04	0.09	0.16	0.13	0.10	0.16	325
9 OTHER TECHNICIANS	0.43	0.39	0.51	0.58	0.63	0.77	0.57	0.58	0.66	1392
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0
11 TEACHERS, ETC.	0.00	0.0	0.0	0.0	0.00	0.01	0.00	0.00	0.01	21
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.23	0.21	0.40	0.59	0.38	0.51	0.47	0.53	0.53	1086
14 MANAGERIAL WORKERS ETC.	1.78	1.62	1.78	1.71	2.04	1.86	1.81	2.10	2.05	4217
15 CLERICAL WORKERS	7.15	6.33	6.96	6.72	6.43	6.91	6.63	6.52	6.49	13382
16 SALES WORKERS	2.58	2.19	1.98	2.15	2.02	2.00	2.31	3.38	2.82	5803
17 TRANSPORT WORKERS	5.54	6.21	6.05	5.88	6.53	6.40	7.40	7.69	7.81	16094
18 SERVICE WORKERS	1.40	1.60	1.35	1.42	1.50	1.61	2.76	2.39	2.63	5428
19 PRODUCTION WORKERS	28.34	31.76	33.19	40.60	36.47	43.68	34.46	38.17	39.24	80865
20 FOREMEN AND SUPERVISORS	1.38	1.67	1.78	1.84	1.88	1.91	2.34	2.28	2.45	5050
21 ARTISANS AND APPRENTICES	2.88	2.76	3.05	3.01	3.43	3.46	3.48	3.13	3.43	7078
22 LABOURERS	47.86	44.83	41.98	34.99	38.08	29.93	37.07	32.55	31.06	64006
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	206100

ECONOMIC SECTOR : (5)BEVERAGE AND TOBACCO INDUSTRY

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.04	0.0	0.0	0.02	0.01	0.0	0.0	0.0	0.0	0
2 ENGINEERS, ETC.	0.29	0.18	0.20	0.21	0.27	0.15	0.19	0.18	0.16	77
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.31	0.22	0.36	0.24	0.25	0.33	0.20	0.25	0.23	106
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
6 NURSES & MIDWIVES	0.02	0.02	0.01	0.03	0.03	0.04	0.02	0.03	0.04	17
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.01	0.0	0.0	0.0	0.0	0.00	0.0	0
8 ENGINEERING TECHNICIANS	0.11	0.04	0.10	0.12	0.21	0.08	0.16	0.31	0.27	128
9 OTHER TECHNICIANS	0.93	0.70	0.86	0.76	0.79	1.05	0.84	1.02	1.03	483
10 ATTORNEY, ADVOCATE, ETC.	0.04	0.01	0.0	0.01	0.00	0.00	0.0	0.02	0.00	2
11 TEACHERS, ETC.	0.0	0.0	0.0	0.01	0.05	0.06	0.0	0.0	0.03	15
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.66	0.76	0.78	0.79	0.66	0.68	0.31	0.59	0.41	191
14 MANAGERIAL WORKERS ETC.	2.97	3.46	2.85	2.63	2.87	2.24	2.49	3.52	2.63	1238
15 CLERICAL WORKERS	10.42	10.06	7.66	7.82	6.97	7.57	8.28	8.65	7.64	3592
16 SALES WORKERS	4.95	4.83	4.05	3.71	3.63	2.94	4.22	5.10	3.89	1826
17 TRANSPORT WORKERS	11.66	10.13	8.67	7.62	11.98	9.96	16.73	12.97	15.45	7260
18 SERVICE WORKERS	3.63	3.52	3.16	2.92	1.67	2.60	2.99	2.25	2.33	1094
19 PRODUCTION WORKERS	28.86	19.90	16.61	22.57	25.79	30.06	29.09	34.62	36.15	16990
20 FOREMEN AND SUPERVISORS	2.02	2.25	1.82	2.32	1.85	2.11	1.86	1.88	1.85	871
21 ARTISANS AND APPRENTICES	1.78	1.62	2.52	2.47	3.18	2.93	2.50	2.48	2.91	1366
22 LABOURERS	21.21	42.30	50.34	45.74	39.55	37.19	30.11	26.12	24.99	11744
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	47000

ECONOMIC SECTOR : (6)TEXTILE INDUSTRY

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	1
2 ENGINEERS, ETC.	0.09	0.07	0.11	0.08	0.04	0.09	0.10	0.09	0.09	169
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.11	0.05	0.08	0.05	0.13	0.14	0.18	0.15	0.19	338
5 MEDICAL DOCTORS ETC.	0.01	0.01	0.00	0.0	0.01	0.01	0.00	0.00	0.00	4
6 NURSES & MIDWIVES	0.03	0.04	0.04	0.04	0.05	0.09	0.06	0.06	0.08	142
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.01	0.01	0.16	0.04	0.12	0.03	0.07	0.09	0.08	150
9 OTHER TECHNICIANS	0.30	0.23	0.30	0.44	0.11	0.16	0.13	0.21	0.10	174
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.00	0.0	0.0	0.00	0.0	0.00	2
11 TEACHERS, ETC.	0.0	0.00	0.0	0.0	0.03	0.05	0.06	0.12	0.12	212
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.28	0.25	0.38	0.34	0.49	0.50	0.55	0.49	0.60	1076
14 MANAGERIAL WORKERS ETC.	0.95	1.12	0.96	1.24	1.16	1.17	1.14	1.60	1.52	2743
15 CLERICAL WORKERS	4.55	5.00	4.65	5.79	5.55	5.84	6.35	6.17	6.65	12008
16 SALES WORKERS	0.18	0.54	0.32	0.36	0.18	0.46	0.60	0.68	0.71	1274
17 TRANSPORT WORKERS	0.74	0.71	0.73	0.85	0.82	0.76	0.82	1.11	1.02	1843
18 SERVICE WORKERS	1.66	1.84	1.52	1.40	1.91	1.68	1.90	1.91	1.95	3518
19 PRODUCTION WORKERS	75.35	75.88	78.48	72.10	73.94	67.74	69.59	68.15	65.41	118139
20 FOREMEN AND SUPERVISORS	2.33	2.28	2.53	2.39	2.90	3.24	3.89	3.82	4.18	7547
21 ARTISANS AND APPRENTICES	0.89	0.97	1.18	0.99	1.03	1.19	1.47	1.42	1.53	2767
22 LABOURERS	12.61	10.99	8.58	13.89	11.55	16.85	13.10	13.53	15.78	28493
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	180600

ECONOMIC SECTOR : (7)CLOTHING INDUSTRY

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
2 ENGINEERS, ETC.	0.01	0.02	0.03	0.01	0.01	0.02	0.04	0.01	0.02	28
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.01	0.00	0.0	0.0	0.02	0.00	0.00	0.02	0.02	19
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0
6 NURSES & MIDWIVES	0.01	0.01	0.01	0.00	0.00	0.00	0.01	0.01	0.01	16
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.01	0.0	0.0	0.00	0.01	0.00	0.02	0.01	0.02	24
9 OTHER TECHNICIANS	0.01	0.02	0.0	0.02	0.01	0.02	0.03	0.03	0.03	37
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
11 TEACHERS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.01	0.01	11
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.42	0.49	0.40	0.55	0.52	0.54	0.37	0.39	0.41	503
14 MANAGERIAL WORKERS ETC.	1.99	1.94	1.77	2.00	2.18	2.40	1.06	1.99	1.67	2050
15 CLERICAL WORKERS	6.35	6.84	5.99	6.40	6.04	6.27	5.67	5.77	5.60	6891
16 SALES WORKERS	1.85	1.88	1.40	1.19	1.60	0.90	0.76	1.44	0.89	1094
17 TRANSPORT WORKERS	1.07	1.08	1.10	0.93	0.72	0.66	1.04	0.64	0.67	830
18 SERVICE WORKERS	4.40	3.86	2.38	3.11	2.15	3.14	4.15	1.93	2.63	3232
19 PRODUCTION WORKERS	77.21	77.53	82.02	80.61	81.40	80.49	80.81	84.58	83.78	103132
20 FOREMEN AND SUPERVISORS	1.63	1.52	1.65	1.97	1.43	2.44	1.89	1.76	2.11	2593
21 ARTISANS AND APPRENTICES	0.21	0.19	0.19	0.21	0.20	0.43	0.05	0.06	0.13	156
22 LABOURERS	4.69	4.63	3.05	3.00	3.72	2.69	4.09	1.35	2.02	2484
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	123100

ECONOMIC SECTOR : (8)LEATHER INDUSTRY

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
2 ENGINEERS, ETC.	0.07	0.11	0.12	0.08	0.07	0.01	0.12	0.03	0.03	4
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.02	0.08	0.03	0.05	0.07	0.07	0.03	0.01	0.03	3
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
6 NURSES & MIDWIVES	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.0	0.02	0.02	0.0	0.01	0.01	0.34	0.02	0.20	23
9 OTHER TECHNICIANS	0.42	0.51	0.23	0.19	0.20	0.34	0.31	0.07	0.15	17
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.03	0.01	0.03	3
11 TEACHERS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.27	0.41	0.23	0.35	0.50	0.23	0.40	0.26	0.32	37
14 MANAGERIAL WORKERS ETC.	2.98	3.46	2.37	2.64	2.34	3.43	2.15	1.94	2.04	237
15 CLERICAL WORKERS	5.16	5.17	3.24	4.56	5.70	5.08	4.51	4.03	4.47	518
16 SALES WORKERS	1.04	1.03	0.98	0.77	1.63	1.60	1.32	0.75	1.34	156
17 TRANSPORT WORKERS	2.82	2.21	1.47	1.29	0.78	2.04	1.18	1.51	1.22	141
18 SERVICE WORKERS	0.82	0.52	0.50	0.34	0.23	0.02	0.46	0.30	0.17	20
19 PRODUCTION WORKERS	52.96	55.29	66.72	76.38	75.75	73.71	64.57	72.53	74.66	8661
20 FOREMEN AND SUPERVISORS	2.23	2.84	2.45	2.33	1.35	1.23	3.31	2.05	2.06	239
21 ARTISANS AND APPRENTICES	0.55	1.59	0.31	0.50	0.34	0.39	0.65	0.59	0.43	50
22 LABOURERS	30.65	26.76	21.34	10.52	11.03	11.82	20.63	15.90	12.85	1491
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	11600

ECONOMIC SECTOR : (9)SHOE INDUSTRY

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
2 ENGINEERS, ETC.	0.03	0.03	0.01	0.04	0.01	0.04	0.03	0.02	0.03	6
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.01	0.00	0.01	0.0	0.01	0.02	0.02	0.02	0.03	5
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
6 NURSES & MIDWIVES	0.00	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.02	4
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.0	0.02	0.01	0.01	0.07	0.02	0.08	0.05	0.08	14
9 OTHER TECHNICIANS	0.03	0.01	0.01	0.01	0.05	0.0	0.0	0.07	0.03	6
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.0	0.0	0
11 TEACHERS, ETC.	0.0	0.01	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.22	0.28	0.40	0.44	0.41	0.73	0.50	0.50	0.61	113
14 MANAGERIAL WORKERS ETC.	1.41	1.50	1.26	1.26	1.65	1.89	0.97	2.29	1.93	357
15 CLERICAL WORKERS	5.03	4.88	5.78	5.59	5.25	6.32	8.19	6.64	7.89	1460
16 SALES WORKERS	0.92	0.50	0.50	1.04	0.46	0.80	0.40	0.74	0.58	107
17 TRANSPORT WORKERS	0.65	0.59	0.52	0.47	0.62	0.41	0.30	0.40	0.28	52
18 SERVICE WORKERS	0.33	0.64	0.48	0.97	0.32	0.54	1.00	0.58	0.77	143
19 PRODUCTION WORKERS	85.55	86.85	86.23	86.92	86.47	82.95	84.39	84.29	83.06	15366
20 FOREMEN AND SUPERVISORS	1.53	2.37	1.69	2.07	1.88	2.47	2.65	2.24	2.72	503
21 ARTISANS AND APPRENTICES	0.23	0.32	0.68	0.31	0.08	0.15	0.05	1.09	0.50	93
22 LABOURERS	4.06	1.99	2.41	0.88	2.69	3.65	1.39	1.06	1.46	271
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	18500

ECONOMIC SECTOR : (10)WOOD PROCESSING

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.00	0.0	0.0	0.00	0.03	0.0	0.00	0.01	5
2 ENGINEERS, ETC.	0.12	0.10	0.09	0.05	0.08	0.09	0.07	0.05	0.06	37
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.09	0.06	0.05	0.04	0.07	0.10	0.08	0.14	0.13	86
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
6 NURSES & MIDWIVES	0.01	0.00	0.01	0.00	0.01	0.01	0.04	0.03	0.04	23
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.08	0.04	0.02	0.02	0.12	0.08	0.06	0.05	0.07	47
9 OTHER TECHNICIANS	0.05	0.01	0.08	0.01	0.00	0.50	0.46	0.55	0.67	431
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	3
11 TEACHERS, ETC.	0.00	0.00	0.0	0.03	0.0	0.01	0.01	0.01	0.01	5
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.25	0.16	0.19	0.12	0.29	0.19	0.15	0.18	0.16	106
14 MANAGERIAL WORKERS ETC.	1.46	1.94	1.42	1.52	1.96	2.11	0.99	1.55	1.42	915
15 CLERICAL WORKERS	3.85	3.61	3.13	3.35	3.52	3.81	4.56	3.45	4.17	2687
16 SALES WORKERS	0.32	0.54	0.36	0.41	0.47	0.87	0.62	0.54	0.78	504
17 TRANSPORT WORKERS	3.52	3.54	3.29	2.45	2.69	4.32	3.81	3.43	4.00	2576
18 SERVICE WORKERS	1.14	0.86	0.59	0.61	0.98	0.82	1.91	1.50	1.78	1148
19 PRODUCTION WORKERS	32.47	27.49	31.39	40.93	32.01	32.60	29.11	46.11	40.12	25840
20 FOREMEN AND SUPERVISORS	1.16	1.69	1.12	1.40	1.53	1.68	2.59	2.40	2.70	1738
21 ARTISANS AND APPRENTICES	3.97	3.15	2.73	2.58	3.48	3.59	2.16	3.01	2.70	1740
22 LABOURERS	51.51	56.80	55.54	46.48	52.78	49.21	53.38	36.58	41.15	26501
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	64400

ECONOMIC SECTOR : (11)FURNITURE INDUSTRY

OCCUPATION	BASE PERIOD								TARGET YEAR : 1987	
	1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
2 ENGINEERS, ETC.	0.02	0.01	0.05	0.02	0.07	0.01	0.12	0.01	0.06	24
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.0	0.0	0.0	0.0	0.0	0.0	0.02	0.01	0.02	6
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
6 NURSES & MIDWIVES	0.0	0.00	0.0	0.0	0.03	0.0	0.0	0.00	0.01	2
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.06	0.03	0.10	0.00	0.06	0.04	0.08	0.01	0.03	13
9 OTHER TECHNICIANS	0.01	0.05	0.02	0.0	0.01	0.00	0.03	0.00	0.01	3
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
11 TEACHERS, ETC.	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.07	0.05	17
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.32	0.22	0.17	0.31	0.16	0.44	0.43	0.24	0.43	160
14 MANAGERIAL WORKERS ETC.	2.15	2.66	2.76	3.10	2.43	2.96	2.41	3.04	2.95	1102
15 CLERICAL WORKERS	4.48	4.29	5.27	5.01	5.23	5.63	6.95	5.36	6.74	2520
16 SALES WORKERS	1.89	1.08	1.71	1.16	1.67	1.09	2.18	1.70	1.89	705
17 TRANSPORT WORKERS	3.73	3.29	3.20	3.55	3.36	3.87	5.00	3.69	4.64	1737
18 SERVICE WORKERS	0.33	0.39	0.43	0.09	0.47	0.75	0.80	0.43	0.81	304
19 PRODUCTION WORKERS	32.48	33.49	39.88	39.76	36.93	34.61	42.34	39.42	41.02	15342
20 FOREMEN AND SUPERVISORS	0.80	0.72	0.83	0.48	1.11	1.17	1.90	0.92	1.66	621
21 ARTISANS AND APPRENTICES	23.01	21.74	18.60	20.25	14.82	17.93	18.96	25.20	20.45	7647
22 LABOURERS	30.74	32.03	27.00	26.27	33.64	31.51	18.75	19.89	15.24	7197
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	37400

ECONOMIC SECTOR : (12)PAPER MANUFACTURING

OCCUPATION	BASE PERIOD								TARGET YEAR : 1987	
	1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.00	1
2 ENGINEERS, ETC.	0.41	0.32	0.40	0.27	0.29	0.42	0.22	0.34	0.29	131
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.14	0.14	0.11	0.08	0.14	0.24	0.10	0.13	0.17	75
5 MEDICAL DOCTORS ETC.	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	8
6 NURSES & MIDWIVES	0.03	0.03	0.03	0.04	0.06	0.02	0.06	0.06	0.06	28
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.19	0.08	0.18	0.29	0.29	0.25	1.17	0.32	0.83	374
9 OTHER TECHNICIANS	0.86	0.57	0.48	0.48	0.71	0.60	0.27	0.39	0.27	124
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.00	1
11 TEACHERS, ETC.	0.0	0.0	0.0	0.0	0.0	0.02	0.01	0.01	0.02	8
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.58	0.87	0.58	0.44	0.80	0.63	0.83	1.15	1.05	476
14 MANAGERIAL WORKERS ETC.	2.04	1.75	2.12	2.08	2.20	2.35	1.46	2.35	2.10	947
15 CLERICAL WORKERS	9.05	9.15	8.69	8.85	9.55	8.02	9.07	9.38	8.90	4024
16 SALES WORKERS	1.26	1.28	0.83	1.09	1.36	1.48	1.47	1.85	1.88	848
17 TRANSPORT WORKERS	3.92	3.61	3.15	4.61	4.11	4.82	5.04	4.12	5.14	2323
18 SERVICE WORKERS	2.47	2.49	2.13	1.32	0.89	1.37	2.22	2.19	1.66	751
19 PRODUCTION WORKERS	35.70	34.78	43.19	31.50	39.57	39.33	40.51	36.56	39.57	17885
20 FOREMEN AND SUPERVISORS	1.96	3.04	1.59	2.33	1.69	2.85	1.48	3.12	2.54	1147
21 ARTISANS AND APPRENTICES	7.41	6.82	7.14	7.26	7.60	6.77	5.11	7.74	6.17	2790
22 LABOURERS	33.98	35.05	29.37	39.37	30.72	30.60	30.97	30.27	25.33	11455
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	45200

ECONOMIC SECTOR : (13)PRINTING INDUSTRY

OCCUPATION	BASE PERIOD								TARGET YEAR : 1987	
	1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01	3
2 ENGINEERS, ETC.	0.13	0.08	0.20	0.14	0.02	0.06	0.05	0.08	0.03	11
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.01	0.02	0.01	0.0	0.00	0.00	0.00	0.01	0.00	1
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
6 NURSES & MIDWIVES	0.00	0.0	0.03	0.02	0.0	0.0	0.0	0.00	0.0	0
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	1
8 ENGINEERING TECHNICIANS	0.0	0.0	0.01	0.07	0.02	0.29	0.07	0.07	0.18	66
9 OTHER TECHNICIANS	0.09	0.05	0.02	0.09	0.05	0.08	0.09	0.11	0.11	43
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.00	1
11 TEACHERS, ETC.	0.0	0.0	0.0	0.11	0.0	0.0	0.00	0.00	0.00	1
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.02	0.0	0.0	0.0	0.03	0.02	6
13 OTHER PROFESSIONAL WORKERS	5.94	6.10	7.18	7.62	7.31	7.09	9.50	6.96	8.14	3061
14 MANAGERIAL WORKERS ETC.	3.19	3.21	3.45	3.22	3.50	3.62	3.22	5.32	4.61	1734
15 CLERICAL WORKERS	10.34	11.94	11.40	11.52	10.88	13.78	15.47	14.53	15.82	5949
16 SALES WORKERS	2.28	2.68	2.57	2.56	3.10	5.02	3.53	5.76	5.82	2187
17 TRANSPORT WORKERS	3.58	6.47	4.10	5.54	3.63	4.90	6.26	5.05	5.68	2135
18 SERVICE WORKERS	1.72	2.82	2.96	2.38	2.50	1.94	1.89	1.62	1.46	549
19 PRODUCTION WORKERS	34.81	24.73	27.69	25.57	28.96	22.31	21.82	24.74	21.97	8261
20 FOREMEN AND SUPERVISORS	0.67	0.52	1.26	0.71	0.73	0.97	1.00	0.74	0.93	351
21 ARTISANS AND APPRENTICES	26.58	25.49	25.87	23.52	26.45	25.38	24.79	20.19	21.38	8039
22 LABOURERS	10.66	15.89	13.26	16.90	12.84	14.56	12.29	14.77	13.82	5201
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	37606

ECONOMIC SECTOR : (14)CHEMICAL INDUSTRY

OCCUPATION	BASE PERIOD								TARGET YEAR : 1987	
	1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.00	0.0	0.00	0.00	0.03	0.02	0.03	30
2 ENGINEERS, ETC.	0.43	0.62	0.76	0.63	0.80	0.91	1.15	1.02	1.21	1380
3 SURVEYORS	0.00	0.0	0.0	0.00	0.0	0.0	0.00	0.00	0.0	0
4 NATURAL SCIENTISTS	0.69	0.86	1.03	0.75	0.79	0.90	0.88	0.89	0.90	1023
5 MEDICAL DOCTORS ETC.	0.03	0.03	0.03	0.04	0.21	0.05	0.04	0.05	0.07	81
6 NURSES & MIDWIVES	0.06	0.06	0.11	0.06	0.13	0.16	0.10	0.08	0.13	148
7 OTHER PARAMEDICAL WORKERS	0.08	0.11	0.11	0.16	0.16	0.35	0.27	0.22	0.34	388
8 ENGINEERING TECHNICIANS	0.22	0.37	0.63	0.50	0.51	0.66	0.75	0.81	0.90	1027
9 OTHER TECHNICIANS	1.84	1.02	2.08	1.73	3.11	2.14	2.04	2.08	2.35	2679
10 ATTORNEY, ADVOCATE, ETC.	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	17
11 TEACHERS, ETC.	0.0	0.0	0.00	0.0	0.07	0.04	0.06	0.06	0.08	89
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.35	0.51	0.72	1.10	0.84	0.69	1.24	1.34	1.42	1612
14 MANAGERIAL WORKERS ETC.	1.85	2.29	2.17	2.57	1.85	1.88	3.84	4.57	4.32	4917
15 CLERICAL WORKERS	8.17	9.55	11.65	11.44	10.56	10.13	12.53	11.48	11.70	13329
16 SALES WORKERS	2.29	3.15	3.77	5.18	2.07	3.07	5.43	4.72	5.14	5856
17 TRANSPORT WORKERS	8.70	3.95	3.97	4.40	3.47	4.33	3.86	4.50	3.87	4410
18 SERVICE WORKERS	2.24	2.23	3.22	3.52	2.49	3.22	2.41	2.80	2.86	3259
19 PRODUCTION WORKERS	29.53	31.09	32.74	32.70	33.43	39.15	39.06	35.54	40.14	45716
20 FOREMEN AND SUPERVISORS	1.95	2.08	2.61	2.10	2.84	3.07	3.81	2.92	3.70	4218
21 ARTISANS AND APPRENTICES	2.81	3.32	2.77	2.92	5.39	5.89	5.10	4.21	5.92	6748
22 LABOURERS	38.75	38.76	31.61	30.21	31.27	23.36	17.38	22.58	14.90	16973
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	113950

ECONOMIC SECTOR : (15)RUBBER PRODUCTS MANUFACTURING

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01	1
2 ENGINEERS, ETC.	0.14	0.27	0.37	0.49	0.23	0.19	0.23	0.27	0.21	42
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.34	0.25	0.18	0.35	0.37	0.55	0.46	0.41	0.55	109
5 MEDICAL DOCTORS ETC.	0.02	0.01	0.02	0.03	0.01	0.01	0.02	0.01	0.02	3
6 NURSES & MIDWIVES	0.03	0.03	0.06	0.07	0.03	0.03	0.08	0.04	0.06	11
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.0	0.01	1
8 ENGINEERING TECHNICIANS	0.11	0.11	0.19	0.84	0.27	0.19	0.40	0.52	0.48	94
9 OTHER TECHNICIANS	0.77	0.68	0.69	0.65	0.49	0.94	0.40	0.52	0.49	96
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.01	1
11 TEACHERS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.04	0.0	0.03	5
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.14	0.31	0.44	0.61	0.63	0.54	0.98	0.99	1.12	221
14 MANAGERIAL WORKERS ETC.	2.91	2.81	3.29	2.55	3.12	2.83	2.73	3.18	2.87	566
15 CLERICAL WORKERS	7.66	7.02	8.77	7.76	7.11	7.48	9.00	8.84	8.84	1741
16 SALES WORKERS	3.00	2.69	4.45	2.29	2.74	3.03	1.33	2.15	1.50	296
17 TRANSPORT WORKERS	1.45	1.04	1.79	1.32	0.54	1.39	1.56	1.70	1.60	315
18 SERVICE WORKERS	1.48	1.28	1.26	0.77	0.79	0.72	1.47	0.76	0.85	167
19 PRODUCTION WORKERS	57.70	61.92	53.19	64.38	65.00	58.68	63.18	61.59	62.45	12302
20 FOREMEN AND SUPERVISORS	2.83	3.15	3.23	4.20	2.18	2.92	4.41	3.73	4.02	792
21 ARTISANS AND APPRENTICES	2.50	3.13	3.60	4.06	3.38	4.07	3.64	4.64	4.40	867
22 LABOURERS	18.93	15.32	18.47	9.63	13.10	16.43	10.05	10.65	10.51	2070
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	19700

ECONOMIC SECTOR : (16)NON-METALLIFEROUS MINERAL PRODUCTS

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.02	0.00	0.0	0.0	0.0	0.01	0.00	1
2 ENGINEERS, ETC.	0.26	0.29	0.28	0.34	0.29	0.36	0.27	0.31	0.33	294
3 SURVEYORS	0.0	0.00	0.00	0.00	0.00	0.00	0.0	0.01	0.01	6
4 NATURAL SCIENTISTS	0.13	0.19	0.16	0.14	0.14	0.15	0.15	0.15	0.15	132
5 MEDICAL DOCTORS ETC.	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	0.00	2
6 NURSES & MIDWIVES	0.01	0.01	0.02	0.01	0.02	0.02	0.07	0.03	0.06	50
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	1
8 ENGINEERING TECHNICIANS	0.19	0.24	0.21	0.19	0.27	0.29	0.29	0.32	0.34	310
9 OTHER TECHNICIANS	0.29	0.64	0.41	0.30	0.34	0.26	0.27	0.31	0.21	189
10 ATTORNEY, ADVOCATE, ETC.	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	1
11 TEACHERS, ETC.	0.0	0.00	0.0	0.0	0.00	0.00	0.02	0.01	0.01	13
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.18	0.20	0.24	0.43	0.40	0.42	0.46	0.67	0.70	629
14 MANAGERIAL WORKERS ETC.	1.93	1.89	1.81	1.66	1.98	1.86	1.73	2.66	2.29	2066
15 CLERICAL WORKERS	4.84	4.98	5.17	5.33	5.95	5.48	6.83	6.32	6.88	6209
16 SALES WORKERS	0.60	0.54	0.69	0.44	0.94	0.87	0.62	1.01	0.98	886
17 TRANSPORT WORKERS	2.81	3.34	3.90	3.38	3.19	3.24	3.35	3.39	3.36	3031
18 SERVICE WORKERS	1.37	1.57	1.67	1.66	1.47	1.49	1.94	1.56	1.73	1563
19 PRODUCTION WORKERS	33.95	35.53	38.26	35.62	41.65	41.05	52.82	49.93	54.43	49093
20 FOREMEN AND SUPERVISORS	1.41	2.05	2.21	2.86	2.44	2.65	4.42	3.02	4.13	3726
21 ARTISANS AND APPRENTICES	3.89	4.88	3.52	3.64	3.70	3.52	4.06	3.72	3.65	3295
22 LABOURERS	48.14	43.66	41.42	43.98	37.21	38.32	22.68	26.57	20.74	18703
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	90200

ECONOMIC SECTOR : (17)BASIC METAL INDUSTRY

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.00	0.00	0.0	0.00	0.01	0.00	0.01	0.00	0.01	9
2 ENGINEERS, ETC.	0.51	0.58	0.60	0.63	0.79	1.05	0.25	0.79	0.76	1051
3 SURVEYORS	0.01	0.03	0.00	0.01	0.02	0.01	0.00	0.00	0.00	1
4 NATURAL SCIENTISTS	0.22	0.21	0.09	0.15	0.13	0.17	0.06	0.14	0.10	137
5 MEDICAL DOCTORS ETC.	0.01	0.02	0.01	0.01	0.00	0.01	0.00	0.01	0.01	7
6 NURSES & MIDWIVES	0.00	0.03	0.05	0.05	0.07	0.08	0.04	0.11	0.10	139
7 OTHER PARAMEDICAL WORKERS	0.01	0.01	0.01	0.04	0.01	0.01	0.00	0.01	0.00	6
8 ENGINEERING TECHNICIANS	0.37	0.41	0.51	0.68	0.73	0.79	0.39	1.03	0.91	1259
9 OTHER TECHNICIANS	1.07	0.87	0.68	1.03	0.61	0.54	0.32	1.19	0.59	819
10 ATTORNEY, ADVOCATE, ETC.	0.00	0.01	0.00	0.02	0.01	0.01	0.00	0.01	0.01	12
11 TEACHERS, ETC.	0.07	0.09	0.12	0.22	0.19	0.32	0.27	0.13	0.29	397
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.26	0.49	0.31	1.03	0.77	1.12	0.49	1.71	1.58	2194
14 MANAGERIAL WORKERS ETC.	1.24	1.09	0.89	1.34	1.60	1.55	0.55	1.38	1.19	1662
15 CLERICAL WORKERS	7.32	6.28	7.24	7.21	7.41	6.50	4.77	7.81	6.10	8482
16 SALES WORKERS	0.40	0.47	0.20	0.27	0.39	0.30	0.15	0.45	0.27	378
17 TRANSPORT WORKERS	2.73	3.07	2.90	2.02	3.00	3.31	3.85	2.73	3.63	5050
18 SERVICE WORKERS	2.16	1.72	1.89	1.36	1.01	1.81	4.53	4.07	4.55	6332
19 PRODUCTION WORKERS	25.06	31.78	35.44	34.90	34.90	36.23	35.58	33.83	36.47	50735
20 FOREMEN AND SUPERVISORS	2.68	1.99	3.29	2.61	2.57	3.14	2.01	3.82	3.31	4610
21 ARTISANS AND APPRENTICES	11.22	12.31	12.80	12.36	11.82	11.39	4.66	12.88	8.21	11414
22 LABOURERS	44.65	38.58	32.55	34.05	33.97	31.67	42.07	27.90	31.92	44406
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	139100

ECONOMIC SECTOR : (18)MANUFACTURING OF METAL PRODUCTS

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.01	0.0	0.00	0.01	0.00	0.00	0.07	0.03	0.05	80
2 ENGINEERS, ETC.	0.43	0.56	0.37	0.45	0.30	0.38	0.51	0.42	0.41	600
3 SURVEYORS	0.0	0.0	0.00	0.01	0.0	0.0	0.01	0.00	0.01	8
4 NATURAL SCIENTISTS	0.04	0.04	0.07	0.02	0.01	0.02	0.02	0.02	0.01	14
5 MEDICAL DOCTORS ETC.	0.00	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.00	1
6 NURSES & MIDWIVES	0.01	0.01	0.05	0.0	0.01	0.03	0.04	0.03	0.04	57
7 OTHER PARAMEDICAL WORKERS	0.0	0.01	0.01	0.01	0.0	0.0	0.0	0.01	0.00	1
8 ENGINEERING TECHNICIANS	0.86	0.86	1.02	0.70	0.56	0.85	1.25	0.86	1.05	1530
9 OTHER TECHNICIANS	0.19	0.21	0.32	0.21	0.33	0.28	0.25	0.25	0.28	413
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.00	0.00	0.01	0.00	0.00	0.01	0.01	16
11 TEACHERS, ETC.	0.0	0.00	0.00	0.00	0.00	0.01	0.07	0.02	0.05	73
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.40	0.44	0.70	0.57	0.62	0.65	0.69	0.64	0.68	994
14 MANAGERIAL WORKERS ETC.	1.76	2.19	1.24	2.20	2.26	4.31	2.06	3.32	3.64	5331
15 CLERICAL WORKERS	6.58	6.68	6.19	7.12	6.47	7.15	7.25	7.00	7.35	10749
16 SALES WORKERS	0.77	0.91	0.59	0.83	0.78	1.03	0.76	1.20	1.12	1640
17 TRANSPORT WORKERS	2.13	1.89	2.07	2.24	2.64	2.62	2.13	2.80	2.79	4082
18 SERVICE WORKERS	1.09	1.12	1.08	1.12	1.12	1.80	2.06	1.40	2.03	2969
19 PRODUCTION WORKERS	40.75	36.28	35.75	33.54	35.51	38.36	41.28	37.75	40.07	58616
20 FOREMEN AND SUPERVISORS	1.27	1.60	1.56	1.62	1.61	2.24	2.31	1.93	2.45	3578
21 ARTISANS AND APPRENTICES	11.14	11.33	10.02	10.18	10.31	9.63	10.90	10.80	10.28	15044
22 LABOURERS	32.57	35.88	38.95	39.16	37.45	30.63	28.33	31.50	27.69	40504
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	146300

ECONOMIC SECTOR : (19)MANUFACTURING OF MACHINERY

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.00	0.00	0.00	0.00	0.01	0.0	0.01	0.01	0.01	9
2 ENGINEERS, ETC.	0.50	0.39	0.86	0.97	0.58	0.63	0.63	0.89	0.81	782
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.03	0.04	0.03	0.02	0.02	0.07	0.04	0.05	0.06	58
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	3
6 NURSES & MIDWIVES	0.00	0.04	0.01	0.03	0.01	0.03	0.04	0.03	0.04	43
7 OTHER PARAMEDICAL WORKERS	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	1.76	1.13	2.03	1.63	1.65	1.70	2.04	2.30	2.30	2231
9 OTHER TECHNICIANS	0.75	0.44	0.46	0.64	1.34	0.42	0.56	0.75	0.69	666
10 ATTORNEY, ADVOCATE, ETC.	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0.01	0.00	3
11 TEACHERS, ETC.	0.00	0.0	0.01	0.01	0.0	0.0	0.02	0.01	0.02	17
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.81	0.61	0.77	0.96	0.71	1.02	1.08	1.04	1.16	1129
14 MANAGERIAL WORKERS ETC.	2.07	2.38	2.79	2.88	3.19	3.12	2.93	3.57	3.49	3381
15 CLERICAL WORKERS	9.23	9.71	10.26	9.26	10.48	8.25	12.59	11.08	11.72	11366
16 SALES WORKERS	1.44	2.94	2.48	1.76	1.86	2.22	2.60	2.06	2.33	2258
17 TRANSPORT WORKERS	1.63	2.03	1.83	1.97	2.13	1.12	1.61	1.87	1.44	1359
18 SERVICE WORKERS	1.27	0.99	1.67	0.88	0.91	0.60	1.66	1.59	1.42	1374
19 PRODUCTION WORKERS	19.46	17.93	18.21	25.18	25.66	27.68	34.50	29.50	35.65	34582
20 FOREMEN AND SUPERVISORS	1.29	1.51	1.75	1.23	0.68	1.46	2.23	1.46	1.85	1799
21 ARTISANS AND APPRENTICES	22.65	19.94	20.53	19.10	19.12	16.73	15.08	16.57	14.12	13701
22 LABOURERS	36.87	39.91	36.33	33.58	31.63	34.96	22.38	27.22	22.89	22199
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	97000

ECONOMIC SECTOR : (20)MANUFACTURING OF ELECTICAL MACHINERY

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.01	0.0	0.00	0.00	0.0	0.00	0.0	0.0	0.0	0
2 ENGINEERS, ETC.	0.91	0.76	0.67	0.88	0.71	0.44	0.75	1.14	0.82	594
3 SURVEYORS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.03	0.01	0.03	0.15	0.08	0.06	0.06	0.04	0.07	52
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.01	0.0	0.00	0.0	0.00	0.00	3
6 NURSES & MIDWIVES	0.03	0.03	0.04	0.07	0.06	0.09	0.11	0.08	0.12	83
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.01	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.84	1.62	2.19	1.61	2.33	2.89	3.00	2.88	3.54	2551
9 OTHER TECHNICIANS	0.80	1.01	0.69	0.68	0.69	0.74	1.22	1.58	1.46	1051
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.00	0.00	0.0	0.0	0.01	0.00	3
11 TEACHERS, ETC.	0.0	0.00	0.0	0.01	0.08	0.12	0.06	0.09	0.12	89
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.38	0.59	0.82	1.64	1.58	0.68	1.37	1.74	1.61	1161
14 MANAGERIAL WORKERS ETC.	1.97	2.34	2.31	2.25	2.18	1.71	2.30	3.49	2.89	2082
15 CLERICAL WORKERS	9.94	10.37	9.84	9.33	9.18	11.21	12.80	11.53	12.78	9200
16 SALES WORKERS	1.54	1.43	1.56	0.97	0.98	1.40	1.82	2.29	2.13	1531
17 TRANSPORT WORKERS	1.77	2.05	2.11	1.97	1.53	1.13	1.65	2.05	1.50	1081
18 SERVICE WORKERS	1.28	1.43	1.18	2.20	1.06	2.13	2.68	1.88	2.61	1877
19 PRODUCTION WORKERS	48.14	46.69	48.77	50.16	51.85	50.92	38.63	43.43	41.77	30072
20 FOREMEN AND SUPERVISORS	2.42	2.54	2.47	3.32	3.07	3.43	3.84	2.61	3.55	2556
21 ARTISANS AND APPRENTICES	11.17	11.37	8.95	9.89	10.32	8.46	10.78	8.40	8.87	6383
22 LABOURERS	18.76	17.78	18.37	14.86	14.30	14.59	18.93	16.76	16.15	11631
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	72000

ECONOMIC SECTOR : (21)MANUFACTURING OF MOTOR VEHICLES AND TRANSPORT EQUIPMENT

	BASE PERIOD								TARGET YEAR : 1987	
OCCUPATION	1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.0	0.0	0
2 ENGINEERS, ETC.	0.19	0.26	0.30	0.76	0.41	0.43	0.47	0.47	0.54	658
3 SURVEYORS	0.0	0.00	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.02	0.00	0.03	0.01	0.02	0.02	0.02	0.05	0.04	53
5 MEDICAL DOCTORS ETC.	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	10
6 NURSES & MIDWIVES	0.05	0.04	0.04	0.07	0.05	0.07	0.09	0.07	0.09	112
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.63	0.77	0.79	0.93	1.19	0.98	1.01	1.04	1.08	1331
9 OTHER TECHNICIANS	0.58	0.47	0.42	0.35	0.37	0.48	0.74	0.41	0.58	715
10 ATTORNEY, ADVOCATE, ETC.	0.00	0.00	0.0	0.00	0.00	0.00	0.01	0.00	0.01	11
11 TEACHERS, ETC.	0.02	0.0	0.01	0.01	0.02	0.01	0.03	0.03	0.03	41
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.82	0.60	0.82	1.44	1.18	1.79	1.57	1.54	1.94	2382
14 MANAGERIAL WORKERS ETC.	2.42	2.52	2.82	2.43	2.67	3.10	2.97	3.52	3.56	4372
15 CLERICAL WORKERS	9.37	10.35	10.85	10.69	9.73	11.85	14.57	11.53	13.88	17043
16 SALES WORKERS	0.99	1.13	1.20	1.40	1.67	0.97	1.61	1.40	1.49	1825
17 TRANSPORT WORKERS	1.76	1.24	1.84	2.49	4.20	1.23	1.12	1.66	1.36	1669
18 SERVICE WORKERS	1.37	0.96	1.92	1.69	1.26	2.81	1.51	1.66	2.07	2540
19 PRODUCTION WORKERS	36.91	36.10	38.23	42.60	41.66	41.46	38.24	45.44	43.96	53980
20 FOREMEN AND SUPERVISORS	2.09	2.49	1.81	2.76	2.30	4.10	5.06	4.40	5.41	6641
21 ARTISANS AND APPRENTICES	14.87	16.03	15.02	12.19	12.08	12.31	11.78	12.06	10.88	13359
22 LABOURERS	27.99	27.01	23.69	20.15	21.18	18.38	19.20	14.72	13.08	16058
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	122800

ECONOMIC SECTOR : (22)MISCELLANEOUS MANUFACTURING

	BASE PERIOD								TARGET YEAR : 1987	
OCCUPATION	1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
2 ENGINEERS, ETC.	0.17	0.28	0.39	0.51	0.49	0.38	0.23	0.39	0.39	193
3 SURVEYORS	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.06	0.02	0.08	0.25	0.20	0.23	0.11	0.14	0.20	100
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.00	0.0	0.00	0.04	0.00	0.03	13
6 NURSES & MIDWIVES	0.02	0.01	0.02	0.03	0.04	0.02	0.02	0.03	0.03	15
7 OTHER PARAMEDICAL WORKERS	0.13	0.14	0.01	0.0	0.0	0.0	0.20	0.11	0.12	60
8 ENGINEERING TECHNICIANS	0.08	0.31	0.56	0.38	1.02	0.45	0.70	1.18	1.17	582
9 OTHER TECHNICIANS	0.71	0.85	0.36	0.50	0.82	0.43	1.14	1.24	1.21	604
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0
11 TEACHERS, ETC.	0.0	0.0	0.0	0.03	0.0	0.0	0.0	0.0	0.0	0
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.35	0.72	0.44	0.49	1.01	0.52	0.69	0.76	0.75	375
14 MANAGERIAL WORKERS ETC.	3.77	4.19	3.63	3.60	3.70	3.51	3.18	4.51	3.69	1842
15 CLERICAL WORKERS	7.16	8.30	7.38	8.83	10.87	10.96	10.16	9.75	11.03	5504
16 SALES WORKERS	1.69	2.13	1.51	1.73	2.19	2.77	2.82	3.12	3.43	1711
17 TRANSPORT WORKERS	2.24	1.47	2.09	2.77	3.82	3.33	4.04	3.19	4.23	2113
18 SERVICE WORKERS	0.19	1.57	1.08	2.10	1.47	1.11	2.35	2.01	2.13	1062
19 PRODUCTION WORKERS	42.89	44.62	51.66	47.72	44.24	51.68	47.68	46.99	49.54	24718
20 FOREMEN AND SUPERVISORS	2.12	1.61	1.48	2.24	2.07	1.95	2.06	1.60	1.95	974
21 ARTISANS AND APPRENTICES	10.47	11.31	9.50	10.23	9.69	7.92	11.71	13.82	12.25	6112
22 LABOURERS	27.96	22.46	19.81	18.59	18.36	14.73	12.86	11.14	7.86	3922
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	49900

ECONOMIC SECTOR : (23)ELECTRICITY ,GAS AND WATER SUPPLY

	BASE PERIOD								TARGET YEAR : 1987	
OCCUPATION	1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.04	0.04	0.04	0.02	0.12	0.04	0.03	0.06	0.05	50
2 ENGINEERS, ETC.	2.17	1.93	1.61	1.20	1.21	1.47	1.23	1.11	1.11	1051
3 SURVEYORS	0.10	0.09	0.08	0.08	0.05	0.06	0.03	0.05	0.02	22
4 NATURAL SCIENTISTS	0.10	0.05	0.08	0.11	0.17	0.06	0.07	0.13	0.10	98
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	1
6 NURSES & MIDWIVES	0.01	0.00	0.01	0.00	0.02	0.02	0.07	0.06	0.08	71
7 OTHER PARAMEDICAL WORKERS	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01	10
8 ENGINEERING TECHNICIANS	0.94	1.14	0.99	0.95	1.32	1.60	1.14	1.14	1.37	1292
9 OTHER TECHNICIANS	0.84	1.00	1.15	1.21	1.32	1.43	1.42	1.62	1.73	1635
10 ATTORNEY, ADVOCATE, ETC.	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	6
11 TEACHERS, ETC.	0.00	0.00	0.00	0.00	0.03	0.01	0.22	0.00	0.12	116
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.06	0.07	0.13	0.19	0.17	0.27	0.62	0.99	0.96	907
14 MANAGERIAL WORKERS ETC.	0.68	0.71	0.61	0.93	0.92	1.22	1.77	0.94	1.59	1507
15 CLERICAL WORKERS	4.88	5.07	4.85	4.71	6.05	5.40	6.17	5.87	6.23	5897
16 SALES WORKERS	0.08	0.05	0.02	0.01	0.02	0.04	0.04	0.02	0.02	19
17 TRANSPORT WORKERS	1.03	1.25	1.16	1.18	2.02	1.07	1.82	1.68	1.81	1716
18 SERVICE WORKERS	3.13	3.86	4.05	2.32	3.75	6.02	3.48	5.20	5.34	5056
19 PRODUCTION WORKERS	12.37	10.96	12.82	10.44	12.61	13.93	11.28	14.40	13.81	13068
20 FOREMEN AND SUPERVISORS	1.90	1.96	1.60	2.27	3.31	2.49	3.51	2.35	3.24	3062
21 ARTISANS AND APPRENTICES	10.73	11.21	9.27	10.60	9.50	8.26	10.52	8.87	8.88	8403
22 LABOURERS	60.94	60.56	61.50	63.73	57.39	56.59	56.57	55.52	53.50	50613
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	94600

ECONOMIC SECTOR : (24)BUILDING AND CONSTRUCTION INDUSTRY

	BASE PERIOD								TARGET YEAR : 1987	
OCCUPATION	1965	1967	1969	1971	1973	1975	1977	1979	PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.10	0.16	0.14	0.16	0.16	0.32	0.33	0.47	0.49	3674
2 ENGINEERS, ETC.	0.35	0.43	0.43	0.36	0.35	0.50	0.43	0.56	0.54	4047
3 SURVEYORS	0.04	0.04	0.05	0.07	0.07	0.09	0.20	0.13	0.19	1397
4 NATURAL SCIENTISTS	0.00	0.00	0.01	0.00	0.00	0.02	0.03	0.01	0.03	209
5 MEDICAL DOCTORS ETC.	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
6 NURSES & MIDWIVES	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.00	7
7 OTHER PARAMEDICAL WORKERS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
8 ENGINEERING TECHNICIANS	0.26	0.22	0.17	0.23	0.28	0.46	0.53	0.43	0.56	4200
9 OTHER TECHNICIANS	0.07	0.09	0.09	0.11	0.11	0.21	0.25	0.14	0.25	1845
10 ATTORNEY, ADVOCATE, ETC.	0.0	0.0	0.0	0.01	0.00	0.00	0.00	0.00	0.00	31
11 TEACHERS, ETC.	0.0	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.02	152
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.18	0.18	0.21	0.23	0.22	0.25	0.33	0.41	0.41	3079
14 MANAGERIAL WORKERS ETC.	1.04	1.26	1.12	1.31	1.54	1.52	1.21	1.35	1.44	10751
15 CLERICAL WORKERS	2.69	3.03	2.54	2.63	2.86	3.24	3.49	4.14	4.10	30653
16 SALES WORKERS	0.30	0.34	0.24	0.13	0.31	0.27	0.26	0.36	0.30	2277
17 TRANSPORT WORKERS	1.37	1.51	1.52	1.17	1.35	1.56	1.74	2.25	2.11	15786
18 SERVICE WORKERS	0.16	0.25	0.36	0.18	0.45	0.46	0.58	0.55	0.65	4880
19 PRODUCTION WORKERS	8.03	10.07	12.21	14.35	12.39	15.36	27.05	29.45	31.47	235013
20 FOREMEN AND SUPERVISORS	1.12	1.11	1.16	1.34	1.84	1.89	1.64	1.92	2.09	15580
21 ARTISANS AND APPRENTICES	20.17	18.26	15.58	16.66	17.97	15.37	16.26	14.15	14.27	106552
22 LABOURERS	64.11	63.04	63.72	61.07	60.08	59.47	45.64	43.69	41.06	306667
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	746800

ECONOMIC SECTOR : (25)TRADE

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.00	0.0	0.00	0.0	0.00	0.00	0.00	0.01	0.01	80
2 ENGINEERS, ETC.	0.11	0.10	0.11	0.07	0.04	0.11	0.08	0.10	0.08	961
3 SURVEYORS	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
4 NATURAL SCIENTISTS	0.04	0.02	0.03	0.02	0.03	0.05	0.06	0.08	0.08	1000
5 MEDICAL DOCTORS ETC.	0.01	0.00	0.00	0.0	0.00	0.00	0.01	0.01	0.01	80
6 NURSES & MIDWIVES	0.00	0.0	0.00	0.00	0.00	0.01	0.00	0.01	0.01	157
7 OTHER PARAMEDICAL WORKERS	0.46	0.50	0.40	0.53	0.55	0.41	0.34	0.54	0.42	5017
8 ENGINEERING TECHNICIANS	0.14	0.09	0.12	0.04	0.03	0.23	0.41	0.22	0.37	4396
9 OTHER TECHNICIANS	0.23	0.17	0.20	0.14	0.22	0.14	0.50	0.68	0.63	7498
10 ATTORNEY, ADVOCATE, ETC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	122
11 TEACHERS, ETC.	0.00	0.0	0.0	0.01	0.00	0.01	0.02	0.00	0.02	223
12 CLERGYMEN, ETC.	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.81	0.50	0.80	0.74	0.71	1.11	1.37	1.53	1.65	19670
14 MANAGERIAL WORKERS ETC.	5.30	6.35	4.65	5.69	6.20	5.83	6.70	8.29	7.98	95138
15 CLERICAL WORKERS	19.26	17.78	18.83	19.27	19.15	21.70	19.40	21.05	21.45	255912
16 SALES WORKERS	23.81	24.56	22.75	25.71	28.04	25.18	25.69	25.12	26.18	312353
17 TRANSPORT WORKERS	9.36	10.60	12.54	10.84	8.69	8.61	8.91	7.14	6.83	81534
18 SERVICE WORKERS	2.16	1.58	2.13	1.63	2.43	2.94	3.94	4.53	4.80	57214
19 PRODUCTION WORKERS	6.06	5.80	5.00	5.91	5.65	7.71	8.68	9.81	10.24	122160
20 FOREMEN AND SUPERVISORS	0.39	0.39	0.43	0.47	0.41	0.64	0.61	0.60	0.68	8153
21 ARTISANS AND APPRENTICES	5.95	5.89	5.21	6.05	5.99	5.37	4.31	3.94	3.83	45641
22 LABOURERS	25.99	25.66	26.79	22.88	21.85	19.73	18.53	16.33	14.72	175591
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1192500

ECONOMIC SECTOR : (26)TRANSPORT AND COMMUNICATION

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	67
2 ENGINEERS, ETC.	0.25	0.26	0.30	0.28	0.26	0.27	0.26	0.26	0.27	1500
3 SURVEYORS	0.00	0.02	0.01	0.01	0.00	0.00	0.01	0.01	0.00	25
4 NATURAL SCIENTISTS	0.02	0.03	0.04	0.04	0.03	0.03	0.02	0.03	0.03	144
5 MEDICAL DOCTORS ETC.	0.0	0.0	0.0	0.0	0.00	0.0	0.00	0.00	0.00	12
6 NURSES & MIDWIVES	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	21
7 OTHER PARAMEDICAL WORKERS	0.07	0.07	0.07	0.05	0.05	0.05	0.05	0.06	0.04	252
8 ENGINEERING TECHNICIANS	0.16	0.45	1.56	1.65	1.96	3.99	3.83	4.18	5.24	29509
9 OTHER TECHNICIANS	0.59	1.45	0.46	0.53	0.68	0.59	0.65	0.80	0.59	3348
10 ATTORNEY, ADVOCATE, ETC.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22
11 TEACHERS, ETC.	0.00	0.01	0.05	0.04	0.07	0.11	0.08	0.09	0.11	626
12 CLERGYMEN, ETC.	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.0	0.0	0
13 OTHER PROFESSIONAL WORKERS	0.20	0.22	0.23	0.26	0.29	0.26	0.38	0.42	0.44	2471
14 MANAGERIAL WORKERS ETC.	1.18	1.11	1.05	1.60	2.06	2.20	2.23	2.53	2.84	15993
15 CLERICAL WORKERS	12.03	12.18	12.60	12.15	11.70	12.35	11.61	12.18	11.87	66824
16 SALES WORKERS	0.10	0.12	0.15	0.20	0.22	0.28	0.31	0.88	0.75	4240
17 TRANSPORT WORKERS	25.42	26.43	26.05	29.23	27.25	26.38	28.38	27.21	27.96	157400
18 SERVICE WORKERS	2.56	2.56	3.90	4.54	4.36	6.03	5.98	5.20	6.82	38386
19 PRODUCTION WORKERS	5.20	5.01	5.20	4.60	6.22	6.53	7.67	7.20	8.04	45256
20 FOREMEN AND SUPERVISORS	0.83	0.99	1.30	1.21	1.13	1.15	1.48	1.41	1.47	8295
21 ARTISANS AND APPRENTICES	6.89	6.88	7.13	6.75	7.12	5.31	5.76	5.11	4.81	27058
22 LABOURERS	44.48	42.19	39.90	36.84	36.58	34.45	31.27	32.41	28.68	161451
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	562500

ECONOMIC SECTOR : (27)MISCELLANEOUS SERVICES AND FINANCIAL ORGANISATIONS

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.40	0.33	0.24	0.46	0.50	0.36	0.31	0.29	0.31	2110
2 ENGINEERS, ETC.	0.47	0.61	0.46	0.56	0.58	0.55	0.61	0.44	0.54	3658
3 SURVEYORS	0.08	0.10	0.10	0.08	0.10	0.08	0.07	0.05	0.05	311
4 NATURAL SCIENTISTS	0.32	0.36	0.24	0.30	0.41	0.31	0.38	0.40	0.40	2729
5 MEDICAL DOCTORS ETC.	1.48	1.62	1.55	0.90	0.95	0.94	0.76	1.29	0.87	5874
6 NURSES & MIDWIVES	2.07	2.52	2.47	2.88	2.94	2.86	3.04	2.56	2.91	19722
7 OTHER PARAMEDICAL WORKERS	0.18	0.18	0.20	0.19	0.22	0.26	0.24	0.26	0.27	1860
8 ENGINEERING TECHNICIANS	0.50	0.48	0.51	0.75	0.82	0.89	0.97	0.69	0.94	6340
9 OTHER TECHNICIANS	1.09	1.27	1.00	1.01	1.05	1.19	1.38	1.30	1.37	9284
10 ATTORNEY, ADVOCATE, ETC.	1.13	1.16	1.10	0.91	1.02	0.88	0.84	0.81	0.72	4907
11 TEACHERS, ETC.	3.27	2.56	2.89	3.31	3.23	2.87	2.77	2.86	2.77	18728
12 CLERGYMEN, ETC.	0.83	1.03	1.54	1.88	2.09	1.53	1.53	1.21	1.64	11106
13 OTHER PROFESSIONAL WORKERS	3.26	3.56	3.91	3.91	4.14	4.08	3.91	4.88	4.76	32245
14 MANAGERIAL WORKERS ETC.	3.55	3.94	3.57	3.97	4.04	4.28	5.02	5.05	5.29	35814
15 CLERICAL WORKERS	22.77	20.73	22.12	23.72	24.65	24.81	24.70	25.78	26.46	179143
16 SALES WORKERS	2.40	3.68	3.32	4.60	3.37	4.29	4.25	4.00	4.24	28692
17 TRANSPORT WORKERS	2.39	2.50	3.32	3.20	2.93	2.88	2.97	2.72	2.96	20023
18 SERVICE WORKERS	39.70	39.73	39.97	34.24	35.27	35.16	34.29	34.41	32.56	220452
19 PRODUCTION WORKERS	2.84	2.72	2.71	3.00	2.06	2.75	2.89	2.43	2.55	17273
20 FOREMEN AND SUPERVISORS	0.20	0.18	0.22	0.20	0.24	0.41	0.34	0.31	0.41	2745
21 ARTISANS AND APPRENTICES	2.27	2.33	2.16	1.95	1.85	1.89	2.02	1.93	1.87	12662
22 LABOURERS	8.79	8.41	6.39	7.96	7.52	6.71	6.73	6.36	6.12	41422
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	677100

ECONOMIC SECTOR : (28)PUBLIC SERVICES

OCCUPATION	BASE PERIOD 1965	1967	1969	1971	1973	1975	1977	1979	TARGET YEAR : 1987 PERCENTAGE	NUMBER
1 ARCHITECTS, ETC.	0.09	0.06	0.07	0.08	0.07	0.06	0.08	0.09	0.08	1041
2 ENGINEERS, ETC.	0.28	0.23	0.23	0.26	0.21	0.22	0.24	0.25	0.23	3047
3 SURVEYORS	0.08	0.07	0.07	0.07	0.08	0.05	0.07	0.07	0.06	806
4 NATURAL SCIENTISTS	0.44	0.41	0.38	0.44	0.50	0.46	0.42	0.48	0.48	6302
5 MEDICAL DOCTORS ETC.	0.68	0.55	0.61	0.72	0.76	0.74	0.98	1.05	1.09	14418
6 NURSES & MIDWIVES	6.05	4.70	4.81	5.81	5.46	5.97	7.31	7.01	7.52	99330
7 OTHER PARAMEDICAL WORKERS	0.54	0.40	0.49	0.58	0.68	0.73	0.68	0.63	0.76	10063
8 ENGINEERING TECHNICIANS	0.29	0.31	0.30	0.23	0.19	0.28	0.29	0.33	0.29	3882
9 OTHER TECHNICIANS	1.29	1.30	1.24	1.43	1.16	1.23	1.53	1.10	1.28	16864
10 ATTORNEY, ADVOCATE, ETC.	0.36	0.32	0.32	0.30	0.31	0.31	0.32	0.32	0.30	4021
11 TEACHERS, ETC.	17.87	16.46	16.83	18.09	19.46	20.73	19.14	20.60	21.34	281696
12 CLERGYMEN, ETC.	0.00	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	264
13 OTHER PROFESSIONAL WORKERS	0.88	0.79	0.81	0.92	1.01	0.97	0.99	1.12	1.14	14990
14 MANAGERIAL WORKERS ETC.	1.79	1.37	1.37	1.53	1.55	1.62	1.45	1.34	1.41	18571
15 CLERICAL WORKERS	8.98	9.53	9.64	9.54	9.30	9.25	9.63	9.46	9.48	125170
16 SALES WORKERS	0.01	0.02	0.02	0.04	0.02	0.02	0.05	0.03	0.04	557
17 TRANSPORT WORKERS	1.67	1.77	1.68	2.07	2.05	2.30	1.73	1.60	1.92	25382
18 SERVICE WORKERS	19.01	16.39	16.63	17.00	16.94	17.01	21.34	20.55	21.08	278245
19 PRODUCTION WORKERS	3.43	3.54	3.30	3.21	4.25	4.13	5.35	3.92	4.98	65803
20 FOREMEN AND SUPERVISORS	0.74	0.72	0.81	0.80	0.72	0.72	0.84	1.07	0.98	12888
21 ARTISANS AND APPRENTICES	2.98	3.29	2.76	3.35	3.10	2.78	2.97	2.63	2.64	34861
22 LABOURERS	32.54	37.74	37.62	33.21	32.18	30.42	24.58	26.33	22.88	301995
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	1320200

BIBLIOGRAPHY

1. ADAMS, J.S. The Structure and Dynamics of Behavior in Organizational Boundary Roles. In : DUNETTE, M.D., (ed.) *Handbook of Industrial and organizational Psychology.* Chicago : Rand McNally, 1976.

2. AHAMAD, B. *and* BLAUG, M. *The practise of manpower forecasting: a collection of case studies.* Elsevier, 1973.

3. BARTLETT, J.B. Problems in Manpower Planning. *Personnel Management*, 5(2), February 1973.

4. BASS, B.M. *Organizational Psychology.* Boston: Allyn and Bacon, 1979.

5. BECKHARD, R. *Organization development. Strategies and models.* Massachusetts: Addison-Wesley Publishing Co., 1969.

6. BELL, D.J. *Planning Corporate Manpower.* London : Longman, 1974.

7. BENNIS, W.A. A funny thing happened on the way to the future. In: *Organizations of the future - interaction with the external environment.* New York : Praeger, 1974.

8. BOSHOFF, F. *Die vermenigvuldiger vir Butterworth en Umtata.* Pretoria : Raad vir Geesteswetenskaplike Navorsing, 1974: M-N-14.

9. BOSHOFF, F. *Die vermenigvuldiger vir Isithebe.* Pretoria: Raad vir Geestes=wetenskaplike Navorsing, 1974: M-N-15.

10. BURACK, E.H. *and* WALKER, J.W. *Manpower Planning and Programming.* Boston : Allyn and Bacon, 1972.

11. CAIN, G.G., FREEMAN, R.B. *and* HANSEN, W.L. *Labor market analysis of engineers and technical workers.* Baltimore : The Johns Hopkins Univ. Press, 1973

12. EBERSOHN, D. *Die ingenieurs van die RSA: 'n Ondersoek na die biografiese kenmerke en aspekte van die werksituasie van persone met opleiding in ingenieurswese soos op 1 Maart 1973.* Pretoria : Raad vir Geesteswetenskap=like Navorsing, 1975: MM-55.

13. GAONKAR, R.S. *Dynamics of technical manpower: System dynamics approach to educational planning.* Ph. D. thesis, Syracuse University, 1975.

14. GRAEN, G. Rule-making processes within complex organizations. In: DUNETTE, M.D. (ed.) *Handbook of Industrial and Organizational Psychology.* Chicago : Rand McNally, 1976.

15. HERBST, H.A.B. *and* WELTHAGEN, A.P.J. *Job opportunities in the manufacturing sector of Ladysmith in 1974.* Pretoria : Human Sciences Research Council, 1976: M-R-33.

16. HERBST, H.A.B. *Werkgeleenthede in die vervaardigingsektor van Rosslyn in 1974.* Pretoria : Raad vir Geesteswetenskaplike Navorsing, 1975: M-N-22.

17. HOFMEYER, K. The case for manpower planning. *People and Profits* , May 1979.

18. ILO. *Yearbook of Labour Statistics*, 1980.

19. KILLIAN, R.A. *Human Resource Management.* New York : AMACOM, 1976.

20. KRUGER, A. *The profitability of occupations and fields of study pursued by graduates in 1979.* Pretoria : Human Sciences Research Council, 1980 : M-N-76.

21. LANGENHOVEN, H.P. Vakkundige werk in Personeelbestuur. *People and Profits*, 8(6), Desember 1980.

22. LOTZ, J.W. *The role, function and training of Black first-line supervisors in some decentralized industries.* Pretoria : Human Sciences Research Council, 1977: MM-68.

23. McBEATH, G. *Manpower Planning and Control.* London : Business Books, 1978.

24. MEGGINSON, L.C. *Personnel and Human Resources Administration.* Illinois : Irwin, 1977.

25. MINER, J.B. *Personnel Psychology.* McMillan, 1969.

26. OFFICE OF THE ECONOMIC ADVISER OF THE PRIME MINISTER. *Economic Development Programme of the RSA 1978-1987,* Vol. 1 and 2. Pretoria : Government Printer, 1980.

27. PATTEN, T.H. *Manpower Planning and the Development of Human Resources.* New York : Wiley-Interscience, 1971.

28. PAYNE, R. *and* PUGH, D.S. Organizational structure and climate. In : DUNETTE, M.D. (ed.) *Handbook of Industrial and Organizational Psychology.* Chicago : Rand McNally, 1976.

29. PETTMAN, B.O. *and* TAVERNIER, G. *Manpower Planning Workbook.* Gower Press, 1976.

30. SAYLES, L.R. *and* STRAUSS, G. *Managing Human Resources.* London : Prentice-Hall, 1977.

31. SCHIJF, U.B. *Manpower planning at AECI:* MANPOWER PLANNING IN PRACTICE SEMINAR, Unisa School of Business Leadership, 1979.

32. SMIT, P.C. *Die arbeidsituasie van ingenieurstegnici in die RSA:* Pretoria : Raad vir Geesteswetenskaplike Navorsing, 1977: MM-65.

33. SMIT, P.C. *Die ingenieurspotensiaal by leerlingtegnici.* Pretoria : Raad vir Geesteswetenskaplike Navorsing, 1976: MM-62.

34. SOUTH AFRICA (REPUBLIC). Department of Manpower Utilization. *Manpower Surveys 1965-1979.* Pretoria.

35. SOUTH AFRICA (REPUBLIC). Department of Statistics. *Current Population Survey.* Pretoria : Government Printer.

36. SOUTH AFRICA (REPUBLIC). Department of Statistics. *South African Statistics, 1978.* Pretoria : Government Printer, 1978.

37. SUID-AFRIKA (REPUBLIEK). *Verslag van die Kommissie van Ondersoek na Arbeids= wetgewing, 1979.* Pretoria : Staatsdrukker.

38. TERBLANCHE, S.S. *Die beweging van vakleerlinge deur die opleidingstelsel.* Pretoria : Raad vir Geesteswetenskaplike Navorsing, 1980: M-N-80.

39. TERBLANCHE, S.S. *and* EHLERS, J.H. *A manpower study for KwaZulu.* Pretoria : Human Sciences Research Council, 1980: M-R-72.

40. THATCHER, V.S. (ed.) *Webster Encyclopedia Dictionary.* Chicago: Consolidated Book Publishers, 1977.

41. TIMPERLEY, S.R. *Personnel Planning and Occupational Choice.* London : George Allen & Unwin, 1974.

42. VAN PLETZEN, J.C. *Die vraag na en aanbod van ingenieurs* Pretoria : Raad vir Geesteswetenskaplike Navorsing, 1981: MM-82.

43. VAN TONDER, J.L. *en* MOSTERT, W.P. *Bevolkingsprojeksies vir Suidelike Afrika vir die tydperk 1970-2020.* 1980.

44. VAN VEIJEREN, C.F. *Manpower planning and strategy.* MANPOWER PLANNING IN PRACTICE SEMINAR, Unisa School of Business Leadership, Pretoria, 1979.

45. VERMAAK, J.A., JACOBS, J.J. *en* TERBLANCHE, S.S. *Die vraag en aanbod van mannekrag in die RSA vir 1981:* Deel II. Pretoria : Raad vir Geesteswetenskaplike Navorsing, 1978: MM-73.

HSRC PUBLICATION LIST

A complete list of HSRC publications or a list of publications of a particular institute of the HSRC can be obtained from the President of the Council.

HUMAN SCIENCES RESEARCH COUNCIL
RAAD VIR GEESTESWETENSKAPLIKE NAVORSING

Private Bag X41
Pretoria
Republic of South Africa
0001
Telegrams RAGEN
Tel. (012) 28-3944
Telex 3-0893

Privaatsak X41
Pretoria
Republiek van Suid-Afrika
0001
Telegramme RAGEN
Tel. (012) 28-3944
Teleks 3-0893

Institutes

S.A. Institute for Communication Research (SAICR)
S.A. Institute for Educational Research (SAIER)
S.A. Institute for Historical Research (SAIHR)
S.A. Institute for Languages, Literature and Arts (SAILLA)
S.A. Institute for Manpower Research (SAIMAR)
S.A. Institute for Psychological and Psychometric Research (SAIPPR)
S.A. Institute for Research Development (SAIRD)
S.A. Institute for Sociological, Demographic and Criminological Research (SAISDCR)
S.A. Institute for Statistical Research (SAISR)
Bureau for Research Support Services (BRSS)
Administration

Institute

S.A. Instituut vir Geskiedenisnavorsing (SAIGN)
S.A. Instituut vir Kommunikasienavorsing (SAIKN)
S.A. Instituut vir Mannekragnavorsing (SAIMAN)
S.A. Instituut vir Navorsingsontwikkeling (SAINO)
S.A. Instituut vir Opvoedkundige Navorsing (SAION)
S.A. Instituut vir Psigologiese en Psigometriese Navorsing (SAIPPN)
S.A. Instituut vir Sosiologiese, Demografiese en Kriminologiese Navorsing (SAISDKN)
S.A. Instituut vir Statistiese Navorsing (SAISN)
S.A. Instituut vir Taal, Lettere en Kuns (SAITALEK)
Buro vir Ondersteunende Navorsingsdienste (BOND)
Administrasie

National Programmes

HSRC Sports Investigation
HSRC Investigation into Education
HSRC Investigation into Intergroup Relations

Nasionale Programme

RGN-Sportondersoek
RGN-Ondersoek na die Onderwys
RGN-Ondersoek na Tussengroepverhoudings

Function of the HSRC

The HSRC undertakes, promotes and co-ordinates research in the human sciences, advises the Government and other bodies on the utilization of research findings and disseminates information on the human sciences.

Funksie van die RGN

Die RGN onderneem, bevorder en koördineer navorsing op die gebied van die geesteswetenskappe, dien die Regering en ander instansies van advies insake die benutting van navorsingsbevindinge en versprei inligting betreffende die geesteswetenskappe.

ISBN 0 86965 820 4

Kitskopié (Pretoria)