

*Saldru copy*

SALDRU FARM LABOUR CONFERENCE

SEPTEMBER 1976

Paper No. 34

An Input - Output Study of Labour Requirements in  
in South African Agriculture

M.A. Tarr



Preliminary Draft : No portion of this paper  
may be quoted without permission of Saldru,  
School of Economics, University of Cape Town.

# An Input - Output Study of Labour Requirements in South African Agriculture.

M.A.TARR.\*

## Introduction.

The purpose of this paper firstly is to study what influence the relationship between agriculture and other sectors of the economy exerts on employment in agriculture and secondly to project agricultural labour requirements to 1979.

In line with other developing countries the contribution which agriculture has been making to the gross domestic product in South Africa has been steadily declining. The Table below shows how this has been changing over the years.

TABLE 1. The percentage contribution of the main branches of production to the gross domestic product, South Africa (1 p. 61.)

Branch of Production	PERCENTAGE CONTRIBUTION TO THE GDP				
	1953/54	1960/61	1965/66	1971/72	1973
Agriculture	16,7	12,4	10,1	9,6	7,8
Mining	11,6	13,7	12,6	10,2	13,4
Secondary Industries	25,9	26,3	29,7	30,4	30,6
Service Industries	45,8	47,6	47,6	49,8	48,2
Total	100,0	100,0	100,0	100,0	100,0

\* Lecturer in Agricultural Economics - University of Natal, Pietermaritzburg - Paper delivered at Farm Labour Conference organised by Southern Africa Labour and Development Research Unit, University of Cape Town 20th to 24th Sept. 1976.

With regard to labour however agriculture still remains the nation's most important employer of Black labour. Table 2 gives employment figures in the main branches of production.

TABLE 2. Employment in the main branches of production.  
South Africa, 1973 (1000 persons)

Sector	Whites	Asians and Coloureds	Blacks
Agriculture	106	141	2672*
Mining	59	8	606
Secondary Industries	363	349	1018
Service Industries	1096	493	1857

\* This includes Blacks employed in the Homelands, and as casual employees on White-owned farms.

This paper will only be concerned with regular farm employees in the commercial sector of agriculture, which is mainly centered around white farmers. The importance of casual labour on farms is expected to diminish in future. With the development of the Black Homelands, secondary industry and increased recruiting by the mining industry it is felt that casual labour will become scarcer. In the maize industry for example there has been a rapid transition from hand harvesting which relied on casual labour, to the use of combines and bulk handling. Table 3 gives employment figures for Black and White full time workers on farms.

TABLE 3. Employment in South African agriculture 1960 - 1971\*

Year	Whites	Coloureds & Asians	Bantu
1960	13 400	132 300	767 800
1961	14 600	135 400	858 000
1962	14 600	134 800	875 600
1963	12 100	124 400	779 700
1964	12 500	131 000	744 600
1965	12 800	132 800	822 300
1969	14 800	126 700	818 000
1971	12 936	96 358	636 454

\* Source: Reference (2).

The figures show no clear trends in the numbers of workers and the employment figures for Black Workers are particularly erratic casting some suspicion on the enumeration in the census. The main problem seems to be in whether a worker is classified as regular or casual. The figures also do not give the full picture on agricultural employment as there are also many more people employed in agriculturally related industries that are dependent on agriculture for their inputs, or as a market for their products. These industries which are mainly involved in food processing, timber and timber products, beverages, tobacco and textiles provided employment for 69 thousand Whites and 506 thousand non-Whites in 1973. Changes in the economy which will exert an influence on agriculture will not only affect agriculture alone but also industries falling into the above categories.

Over the past fifty years science and technology have placed new instruments at man's disposal and rapid changes have taken place throughout the economy. The introduction of new technologies has led to a greater interdependence between the farming sector and other sectors of the economy. Today's farmer is heavily reliant on off-farm inputs which incorporate the new technologies, such as machinery and tractors, fertilizers, fuel, insecticides and stock feeds. The above situation can be contrasted to fifty years ago when a large proportion of the inputs such as seed and animal draft power were produced or reared on the farm.

Another change is the rapid development of the agricultural processing industries with the consequent shift of the population from the rural to the metropolitan areas. In 1936, 35 per cent of the White population lived in rural areas compared to 13 per cent in 1970. The development of metropolitan areas has been accompanied by an increased demand for processed and semi-processed foodstuffs. Agriculture and the rest of the economy have become more interdependent.

It is apparent that it is difficult and hazardous to study agriculture in isolation. Changes taking place in other sectors of the economy can have a marked effect on farming and visé versa.

The interdependence between agriculture and the rest of the economy is here studied by means of input-output analysis, which takes into account all the flows of goods and services in the country and avoids the pitfalls inherent in partial equilibrium analysis, which studies one sector in isolation. It is also possible to estimate the direct and indirect influences on the demand for labour, which result from any change in the economy. Employment statistics show declining farm populations and the movement of workers out of agriculture, but this is not the full story.

Many tasks once performed on the farm are now performed off the farm in the agricultural processing industries. Consumers are demanding more services along with their foods, thus increasing labour requirements in the agricultural processing sectors. The study of agriculture in isolation would lose sight of these indirect labour requirements.

TABLE 4 Labour requirements per one million rand output in South African agriculture (d)

	Year (c)	Output R million	DEFLATED OUTPUT		TOTAL EMPLOYMENT		LABOUR PER R1 MILLION OUTPUT			
			(a)	(b)	White	Black	White		Black	
					x 1000		(a)	(b)	(a)	(b)
June	1960	794	980	879	119,3	899,9	122	136	1023	918
"	1961	857	1032	942	119,8	993,4	116	127	1054	963
"	1962	884	1065	1004	120,6	1010,5	113	120	1006	949
"	1963	929	1106	1032	116,8	904,1	106	113	876	817
"	1964	958	1077	995	113,9	875,5	106	114	880	812
"	1965	1031	1158	1031	108,2	821,1	93	105	796	709
"	1967	1328	1397	1324	106,6	818,3	76	81	586	618
"	1969	1287	1313	1226	107,7	815,5	82	88	665	621
"	1971	1467	1396	1369	104,4	732,8	75	76	535	525

- (a) Output has been deflated by the wholesale price index April 1970 = 100.
- (b) Output has been adjusted by the index of the volume of agricultural production. Differences thus reflect differences in volume at 1965 prices.
- (c) Certain years have been omitted due to lack of data.
- (d) Sources: Abstract of Agricultural Statistics 1975.  
 South African Statistics ..... 1974.  
 Agricultural Census ..... 39 and 43.
- (e) Total taken as number of White-owned farms plus employees on White-owned farms.

It was for the above reasons that it was decided to use an input-output model when studying the labour requirements in agriculture. The model used was a 1967 input-output model of the South African economy prepared by the Department of Statistics. (3).

The balance of the paper will present some of the findings of this study. For the reader who is interested, he may refer to reference (5) or to the writer regarding the model used in this study and the various assumptions necessary for the use of the model.

Direct Labour Requirements.

Table 4 shows direct labour requirements per R1 million output in agriculture. It is interesting to note that there has been a steady decline in the number of employees both black and white required to produce R1 million output. Because of the difficulty of finding a suitable index to deflate the value of agricultural output to a common base year two different methods were used to do this. The reader will note that both methods showed the same trend in labour requirements and the actual divergence between the figures, especially in later years was not too great.

This decline in the number of employees has been accompanied by a rapid increase in the use of farming requisites over the same period. Table 5 that follows shows the main ones.

TABLE 5. Increase in the use of certain farming inputs between 1960/61 and 1970/71 (2)

	1960/61	1970/71	Percentage increase
Tractors (numbers)	122 218	157 127	28,5
Trucks (numbers)	69 516	94 649	36,2
Fertiliser (value millions)*	38,6	85,3	121,0
Stockfeeds (value millions)*	43,1	67,3	56,1
Dips & Sprays (value millions)*	9,3	16,6	78,5

\* Values have been deflated by their own price indices to make them comparable between years.

The reader should also note that the above table does not reflect quality differences. For example average tractor size has been increasing over the years.

Labour requirements in agriculture also vary between the different economic regions in South Africa. These regions are shown in Figure 1 that follows. Table 6 shows the direct labour requirements for each region.

TABLE 6. Labour requirements of agriculture per one million rand output. Main economic regions South Africa, 1967 (b)

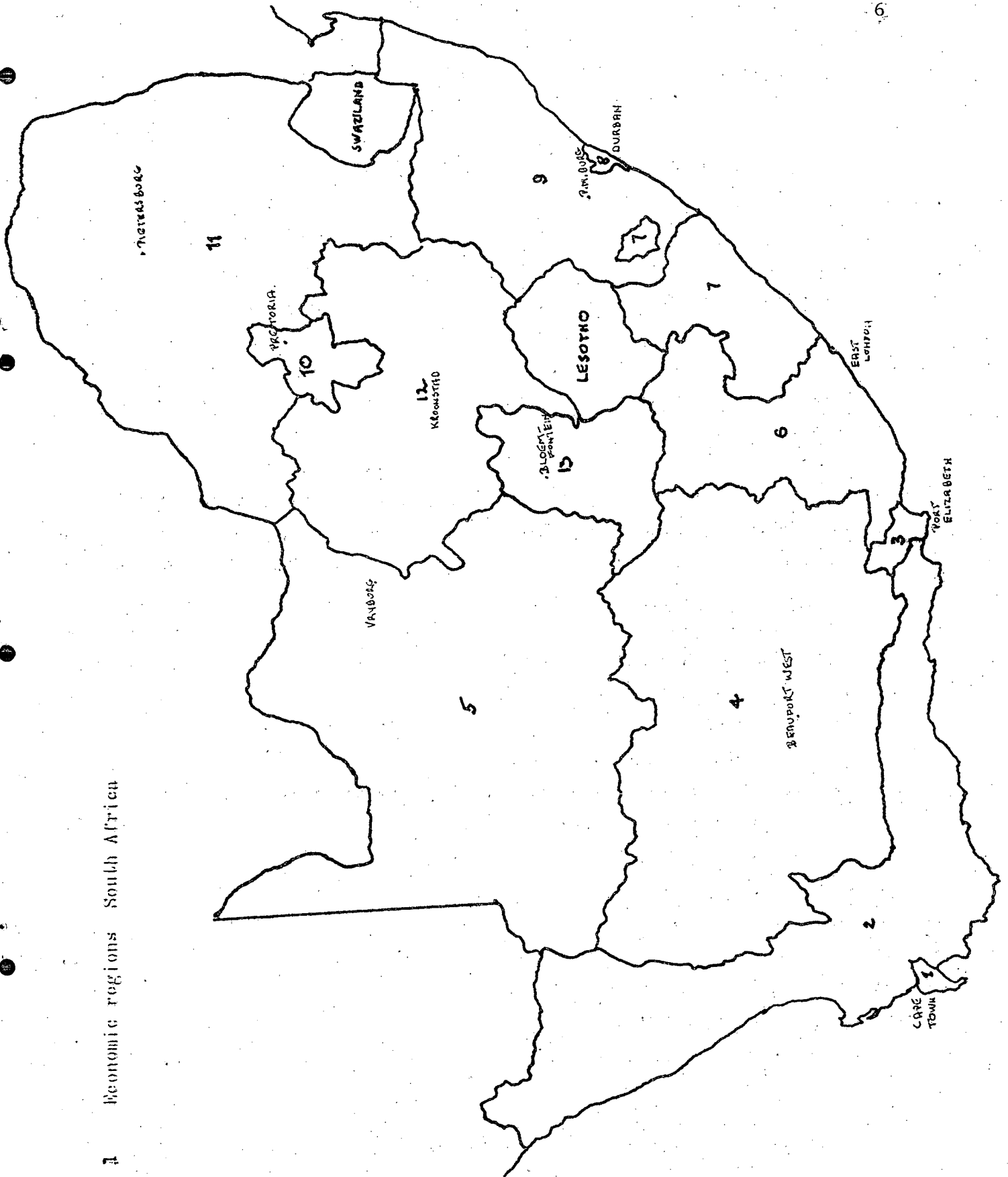
Economic region	Output R million	TOTAL LABOUR USAGE		LABOUR PER R1 MILLION OUTPUT	
		White (a)	Black (b)	White	Black
1	43,3	685	4 781	15,8	110,5
2	198,9	17 165	83 363	86,3	419,2
3	3,0	971	3 040	323,7	1013,0
4	60,0	6 021	24 582	100,2	409,3
5	115,6	10 245	43 233	88,6	373,9
6	73,8	7 261	49 980	98,4	677,3
7	4,3	608	2 609	142,4	611,0
8	9,1	1 192	16 973	131,3	1869,3
9	192,8	10 085	161 490	52,3	837,7
10	83,0	7 195	29 805	86,7	358,9
11	239,0	19 261	182 186	80,6	762,3
12	377,7	20 682	187 811	54,8	497,2
13	44,3	5 122	25 590	115,7	578,0

(a) Total taken as the number of White-owned farms and White employees on White-owned farms.

(b) Source: Agricultural Census 39 and 43.

Region 3 has a very low agricultural output and extremely high direct labour requirements for White and Black labour. A possible reason for this is that region 3 comprises a very small area around the industrial centre of Port Elizabeth. A very high proportion of workers, Black and White, enumerated as agricultural workers in the census could in fact have been part-time farmers or farm employees. Another reason, of course, is the extremely low agricultural output in the area concerned.

FIG 1 Economic regions South Africa





A doubling in output would only mean a R3 million increase in production and this of course would affect the direct labour requirements drastically. A margin of error in census data of say R1 million would affect such a small region far more than a large region.

All the regions, except Region 1, appear to be much in line as regards White employees. Region 1 also has a very low figure for Black employees. It is well known that Region 1 is one of the few areas in South Africa which has very little Black labour available. The bulk of the labour comes from the Coloured population group who are generally in a higher skill category than Black labourers. There is also strong competition for labour from industry in the Cape Town area. There is thus less labour available for farming purposes and what labour there is tends to be more skilled and thus more productive. The low number of White farm employees is probably partly due to the fact that Coloured labourers also occupy a high proportion of managerial positions on farms.

The highest Black labour requirements per R1 million output in agriculture are in Region 8 which is the small area surrounding the industrial centre of Durban. Reasons similar to those for Port Elizabeth probably also apply here. In addition Natal has a very high Black population in the neighbouring Black Homelands and if anything there is a surplus of Black labour in these regions. A perusal of the Black labour requirements per R1 million output will show that all areas bordering on or close to Black Homelands tend to use far more labour than other areas. This is probably because labour is freely available.

It would seem reasonable to assume that a fairly high level of underemployment exists in such a situation. This of course creates problems in estimating and projecting labour requirements because the danger exists that a labour requirement for a given year will be estimated which incorporates a high level of underemployment. Should labour in the interim have become more productive and underemployment reduced the estimated labour requirement could seriously overestimate the numbers of workers required.

Having examined the trend in direct labour coefficients for agriculture it is also interesting to see what trend they have followed in other sectors of the economy. Table 7 below shows this.

TABLE 7. Labour requirements per one million rand output for South Africa\*

YEAR	MINING		MANUFACTURING		SERVICES	
	White	Black	White	Black	White	Black
1965	43	390	50	145	155	332
1967	43	387	44	130	168	359
1969	36	339	37	114	150	341
1971	36	363	35	115	158	311
1973	25	259	33	115	145	312

\* Output is measured at 1970 prices and the wholesale price index was used to deflate production figures for the various years.

The above table clearly indicates that the trend of increasing output per worker in agriculture is also taking place in the rest of the economy. A comparison between Tables 4 and 7 shows that mining and manufacturing use less White labour per R1 million output than agriculture, but that the Services sector has a higher White labour requirement than agriculture. On the other hand agriculture has the highest requirement for Black workers of all the sectors.

Employment Multipliers.

Because of the interdependence between various sectors of the economy a change in output in one sector will not only generate increased labour requirements in that sector but also in other sectors of the economy. A measure which gives an indication of the distribution of employment is the employment multiplier. This calculated as the ratio of the total employment induced by a R1 million change in deliveries to final demand over the direct employment requirements per one million rand output. A sector with a high multiplier causes a large change in indirect employment for a given change in final demand.

Employment multipliers are given in the following tables for agriculture and a number of related sectors.

TABLE 8. Direct employment requirements, direct plus indirect employment effects per million rand deliveries to final demand and employment multipliers, South Africa 1967 and 1973 (White Labour)

SECTOR See key in appendix.	DIRECT		TOTAL		MULTIPLIER	
	1967	1973	1967	1973	1967	1973
1. Agriculture	79,13	77,31	126,79	115,58	1,602	1,495
5. Meat, Dairy Products and Fish Processing	16,41	14,54	133,46	120,71	8,133	8,302
6. Grain, Sugar and Animal Feeds Processing	16,54	14,53	132,35	119,52	8,002	8,226
21. Fertilisers and Pesticides	30,00	21,68	118,15	100,25	3,938	4,624
35. Agricultural Machinery	78,43	81,33	180,92	177,87	2,307	2,187
48. Wholesale and Retail Trade and Motor Trade	109,17	105,52	179,72	173,40	1,646	1,643
51. Other Services	179,13	210,23	248,96	283,61	1,390	1,349

TABLE 9. Direct employment requirements, direct plus indirect employment effects per million rand deliveries to final demand and employment multipliers, South Africa 1967 and 1973 (Black Labour)

SECTOR See key in appendix.	DIRECT		TOTAL		MULTIPLIER	
	1967	1973	1967	1973	1967	1973
1. Agriculture	586,00	535,00	716,29	653,27	1,222	1,221
5. Meat, Dairy Products and Fish Processing	79,03	83,78	635,65	595,94	8,043	7,113
6. Grain, Sugar and Animal Feeds Processing	79,67	83,76	620,66	582,03	7,790	6,949
21. Fertilisers and Pesticides	60,26	47,42	298,03	276,07	4,946	5,822
35. Agricultural Machinery	94,11	111,46	302,05	318,26	3,210	2,855
48. Wholesale and Retail Trade and Motor Trade	126,64	139,32	299,86	305,33	2,368	2,192
51. Other Services	590,87	517,54	803,14	782,29	1,359	1,512

In contrast to agriculture the agricultural processing sectors have very high employment multipliers showing that most employment generated by a change in final demand is not in the sector concerned.

Another way of estimating the employment impact of a change in final demand is to calculate the effect induced by a given percentage change in final demand in one sector on employment in another sector. Tables 10 and 11 show how changes in final demand in the agricultural processing sectors influence employment in agriculture.

It is interesting to note that in the case of Black workers the total employment effect in agriculture exerted by sectors 5, 6, 7 and 8 declined marginally between 1967 and 1973, whereas the employment effect on White workers showed a marginal increase in the same sectors. A very likely explanation of this is that labour productivity increased at a faster rate between 1967 and 1973 for Black workers than for White workers. When one considers that most White workers were probably originally in the skilled worker category, and hence had correspondingly less scope for increasing their efficiency than Black workers, the above supposition seems to stand up fairly well.

The above findings could have important implications for policy. Where surplus or underemployed labour is shown to exist the introduction of new or labour-saving technologies would counter the objective of full employment. The impact of introducing any new technology should thus be carefully studied with regard to its influence on labour requirements particularly in regions such as the Bantu Homelands in South Africa. Expansion of the agricultural processing

TABLE 10. Effect of a ten per cent change in final demand in agricultural processing sectors on employment in agriculture (White Labour)

Sector (See key in appendix)	Employment requirements in agriculture (Workers)		10% change in final demand (R million)		Total employment effect in agriculture (Workers)	
	1967	1973	1967	1973	1967	1973
5. Meat, Dairy Products & Fish Processing	57,28	55,96	34,70	36,64	1988	2050
6. Grain, Sugar & Animal Feeds Processing	54,22	52,98	26,01	27,50	1410	1457
7. Other Food Processing	30,63	29,93	32,60	34,38	999	1029
8. Beverage Industries	17,37	16,97	11,17	16,90	194	287
9. Tobacco Industries	28,33	27,68	5,77	9,80	164	271
10. Wool Scouring, Cotton Ginning & Dyeing of Wool & Cotton	51,05	49,87	3,71	0,80	189	40
11. Spinning, Weaving, Knitting & Finishing of Textiles	10,65	10,40	1,02	5,70	11	59
13. Leather & Leather Products	21,52	21,03	1,31	0,51	28	11
14. Footwear	7,84	7,66	7,62	7,75	60	59

TABLE 11. Effect of a ten per cent change in final demand in agricultural processing sectors on employment in agriculture (Black Labour)

Sector (See key in appendix)	Employment requirements in agriculture (Workers)		10% change in final demand (R million)		Total employment effect in agriculture (Workers)	
	1967	1973	1967	1973	1967	1973
5. Meat, Dairy Products & Fish Processing	424,18	387,26	34,70	36,64	14 719	14 189
6. Grain, Sugar & Animal Feeds Processing	401,54	366,60	26,01	27,50	10 444	10 082
7. Other Food Processing	226,83	207,09	32,60	34,38	7 395	7 120
8. Beverage Industries	128,60	117,41	11,17	16,90	1 437	1 984
9. Tobacco Industries	209,82	191,56	5,77	9,80	1 211	1 877
10. Wool Scouring, Cotton Ginning & Dyeing of Wool & Cotton	378,04	345,14	3,71	0,80	1 403	1 280
11. Spinning, Weaving, Knitting & Finishing of Textiles	78,86	72,00	1,02	5,70	80	410
13. Leather & Leather Products	159,40	145,53	1,31	0,51	209	74
14. Footwear	58,08	53,02	7,62	7,75	443	411

sectors would create large employment requirements in the Homelands. In so far as it does not reduce their competitive position these industries should thus resist adopting labour-saving technologies.

Increased output in the Meat, Dairy Products and Fish Processing sector exerts the strongest influence on White and Black employment in agriculture\*. It is essentially the livestock enterprises that contribute to this sector and it was possibly due to the following characteristic of livestock production that this was the case. Livestock production with perhaps the exception of beef production, does tend to be more labour intensive in the sense that it does not lend itself so readily to mechanisation as crop production. Increases in output are thus associated with greater increases in the use of labour than increases in other branches of agriculture. An increase in demand by this sector would thus have a greater impact on employment requirements in agriculture than other sectors. It is thus possible to quantitatively assess the influence changes in demand in other sectors in the economy will exert on employment in agriculture.

This could be important as far as decentralisation of industry is concerned. To what extent would the industries concerned stimulate employment in agriculture. Where large pools of underemployed labour exist such as in the Bantu Homelands this could be important. Not only would the industries themselves be employers of labour but they would also generate increased employment in agriculture. Industries falling in this category are obviously those processing agricultural products.

If an input-output table for a particular Homeland were available it would thus be theoretically possible to estimate accurately the impact the establishment or expansion of any industry would have on employment. This of course assumes that the industry in question obtains all its inputs locally and outside sources are precluded from supplying inputs. For example, a maize milling industry could be established and make it policy as far as possible to draw all its supplies of raw maize locally. This is a point which is possibly often overlooked when industries are established. People tend to look only at the direct employment requirements whereas in some industries particularly those with a high employment multiplier the effect as we have seen from Tables 8 and 9 can be several times the direct employment effect.

---

\* At this stage it should be mentioned that fish processing is obviously not in any way related to agriculture but is included here because of the form in which the statistics were available. The output of the fish processing sector was however only about two per cent of the total output of the sector and hence would not make a significant impact on agriculture.

This point could also be important as far as education planners are concerned. Looking at the direct employment requirements of one industry alone and providing training facilities to cater for this could be totally inadequate. What should be done is also to look at all the indirect and induced employment effects and when providing for training and educational facilities.

If we return to our example of a maize mill this point can be illustrated. The direct employment requirements for such an undertaking would be a certain number of maize millers, administrative and sales personnel and a few other categories of skilled and semi-skilled workers. If the policy was to draw all maize supplies from local sources, say an underdeveloped area in the Homeland, it would be essential to provide amongst other things training and extension to the local inhabitants in market orientated maize production.

The above example while intended to be theoretical has in fact occurred in the Homelands in South Africa. Mills have been established in the Homelands but continue to draw most of their supplies from White farming areas. A vigorous policy of encouraging and assisting local inhabitants to produce the requirements of the mills would generate a considerable amount of employment. This is obviously a slow process and one which does not occur overnight, but nevertheless one which should be pursued as a matter of priority.

#### Manpower Projections.

Projections of Black and White manpower requirements were made for the various sectors of the South African economy. These are given for Black and White labour in the following two tables. The key to the various sectors is given in the appendix. In order to test the accuracy of the model 1973 employment estimates were projected from 1967. In most cases there was a fairly close correspondence between the actual and projected figures. Employment projections were then made to 1979 and these were then compared with those made in the E.D.P. (1).

In most cases there is a fairly close correspondence between predictions. Estimates based on the input-output model however tend to be somewhat higher. This could first of all be due to assumptions inherent in the use of input-output models such as a constant technology matrix or the incorrect projection of the direct labour requirements vector for 1979. E.D.P. projections could also have been on the low side. When making their projections the EDP planners do not take into account all the direct and induced indirect labour requirements. Normally, they project output for each sector and then calculate labour requirements necessary to produce this output. The danger thus exists of losing sight of indirect employment effects which can be quite considerable especially in an industry with a high employment multiplier.

TABLE 12. Employment estimates for Black Labour in South Africa

Sector (See key)	1 9 7 3		1 9 7 9	
	Actual	Estimate	EDP Proj. (b)	Model Proj.
1	818 300	818 263	-	963 226
2	393 000	391 034	403 000	355 720
3	64 000	67 469	77 000	88 120
4	157 000	164 731	236 000	223 884
5, 6, 7	121 000	121 530	134 000	144 623
8, 9	28 000	28 069	36 000	33 105
10, 11	80 000	81 357	109 000	109 684
12	123 000	123 523	171 000	170 996
13	7 000	6 932	8 000	9 190
14	34 000	34 051	43 000	46 187
15	57 000	65 046	68 000	93 419
16	31 000	31 146	42 000	42 576
17, 18, 19	25 000	27 769	31 000	33 818
20	19 000	20 263	24 000	23 334
21, 22, 23	35 000	36 118	37 000	44 266
24, 25	11 000	11 353	13 000	14 249
26	8 000	8 471	10 000	9 325
27	17 000	17 526	25 000	24 758
28	16 000	16 535	24 000	24 167
29, 30	85 000	95 054	113 000	115 770
31	41 000	51 181	63 000	78 020
32	10 000	15 181	13 000	20 423
33, 34	111 000	119 562	158 000	160 936
35, 36	37 000	39 765	45 000	48 168
37, 38	31 000	33 381	43 000	46 855
39, 40	51 000	107 263	61 000	127 808
41, 42	12 000	12 244	17 000	16 188
43	12 000	12 333	16 000	12 235
44, 45	46 000	48 081	56 000	60 002
46, 47	331 000	355 291	459 000	492 819
48, 49	371 000	380 032	509 000	500 592
50, 51	1 979 000	2 007 677	2 216 000	2 652 499
TOTAL	5 161 300	5 348 231	5 260 000(a)	5 823 736(a)

(a.) Excluding agriculture (sector 1).

(b) Source: (1).

TABLE 13. Employment estimates for White Labour in South Africa

Sector (See key)	1 9 7 3		1 9 7 9	
	Actual	Estimate	EDP Proj. (a)	Model Proj.
1	106 000	105 683	102 000	115 462
2	38 000	37 887	39 000	34 510
3	4 000	4 291	4 000	5 615
4	17 000	17 914	23 000	24 353
5, 6, 7	21 000	21 288	22 000	25 328
8, 9	7 000	7 136	8 000	8 449
10, 11	8 000	8 277	8 000	11 164
12	10 000	10 116	11 000	14 010
13	1 000	1 059	1 000	1 411
14	2 000	2 078	2 000	2 826
15	7 000	8 057	7 000	11 574
16	6 000	6 093	7 000	8 333
17, 18, 19	6 000	7 945	8 000	9 714
20	19 000	20 263	20 000	23 338
21, 22, 23	16 000	16 642	16 000	20 416
24, 25	7 000	7 282	8 000	9 148
26	4 000	4 274	4 000	4 917
27	6 000	6 236	6 000	8 812
28	4 000	4 194	4 000	6 129
29, 30	16 000	18 020	19 000	21 979
31	28 000	34 975	39 000	53 312
32	3 000	4 610	4 000	6 203
33, 34	35 000	37 864	40 000	50 900
35, 36	27 000	29 058	29 000	35 202
37, 38	17 000	16 169	19 000	22 520
39, 40	20 000	42 142	22 000	50 259
41, 42	7 000	7 209	9 000	9 540
43	6 000	6 206	6 000	6 178
44, 45	20 000	20 996	22 000	26 226
46, 47	59 000	63 451	74 000	88 003
48, 49	281 000	287 843	311 000	379 146
50, 51	815 000	827 877	988 000	1 096 101
TOTAL	1 623 000	1 693 135	1 882 000	2 191 078

(a) Sources: (1).



The total supply of labour in the population is mainly determined by population growth. In the case of South Africa immigration has also served to increase the supply of White labour. The table below gives projections of the South African population to 1980.

TABLE 14. Population and Economically Active Population in South Africa (1980)\*

Race	Population 1980	Economically active 1980	Labour projections 1979
White	4 433 000	1 803 344	2 191 078
Indian	825 000	247 005	6 786 962
Coloured	2 818 000	1 031 106	
Bantu	20 639 000	7 890 290	
TOTAL	24 282 000	9 168 401	6 786 962

\* Source: References 1 and 4

The economically active proportion of the population has been calculated from participation rates according to race, sex and age group as used in the Economic Development Programme (1). Immigration figures are not included in the above White population figures. Assuming an annual net immigration figure of 30 000 and bearing in mind the fact that a larger percentage of immigrants are economically active (46, 61 per cent) this would mean an annual increase in the economically active White population of 14 000 persons. Over the seven-year period between 1973 and 1980 this would amount to 98 000 persons increasing the economically active White population to 1 901 334 persons.

One thing which is apparent from the above table is that the projected White employment figures for 1979 are nearly 15 per cent (2,191 million as compared to 1,803 million) in excess of the estimated White participation figures in 1980.

The opposite is the case with Black labour. Unfortunately, it was not possible to estimate Indian and Coloured labour requirements separately but the overall picture would seem to indicate a 25 per cent (6,787 million as compared to 9,168 million) surplus of Black labour. Care should, however, be exercised when viewing the above figure. Firstly, no account has been taken of casual labour on farms. In 1972 this amounted to 650 000 persons. Secondly, the participation rate for Bantu has been taken over the whole population. A large

proportion of the Bantu however reside in the Homelands where the participation rate used is probably too high - (36,7 per cent). Many of these Bantu are involved in traditional subsistence agriculture and do not enter the labour market.

With the foregoing reservations in mind even if one assumes that employment projections are on the high side it is apparent that there is going to be a shortage of White labour and also a surplus of Black labour. If traditional labour ratios between White and Black labour are maintained artificially, it will not be possible to sustain a growth rate consistent with the level of final demand which has been projected.

There are however indications that Blacks, mainly Indians and Coloureds, are filling the gaps created by the shortages of White labour. For further planning it would be necessary to identify the industries which are most likely to suffer from acute labour shortages and set programmes in motion to alleviate these shortages with trained Black workers.

From an overall point-of-view it is necessary to translate the total labour requirements for each sector of the economy into skill or worker categories, co-ordinate these for all the sectors of the economy and then plan the necessary facilities to provide for the total labour requirements.

It would not however appear that agriculture will be faced with any serious shortages of Black labour even with the existing state of technology. Labour saving technologies will only serve to aggravate the problem of Black unemployment or underemployment.

The foregoing leads to conclusion that there will not be any substantial increases in black wages in agriculture in the near future. Wages will continue to be depressed by surplus labour. This of course does not mean that wage rates will not improve in certain areas but the overall situation does not appear encouraging.

#### Discussion and Conclusion.

Labour productivity when measured in terms of labourers required for R1 million output has been increasing. This has been largely due to improved technologies and combining labour with more capital inputs. Projections of labour requirements in the South African economy and of labour availability show that by 1980 there will be a shortage of White labour and a considerable surplus of Black labour if traditional White Black labour ratios are maintained. If growth

rates projected in the Economic Development Programme are to be achieved Black labour will have to move into White jobs. The surplus of available Black labour also leads to the conclusion that there will be no rapid improvement in wages in agriculture as a whole. Labour substituting technologies will only aggravate the situation.

With regard to agricultural labour in the Homelands the opportunity would appear to exist for a considerable expansion in employment. One way to do this would be to establish industries such as food processing industries which generate a considerable amount of indirect employment. These industries would of course have to encourage local sources of supply as far as possible.

References.

1. Economic Development Programme for The Republic of South Africa. 1974-1979. released by the Office of the Economic Advisor to the Prime Minister.
2. Abstract of Agricultural Statistics. 1975. Issued by the Division of Agricultural Marketing Research, Pretoria.
3. Department of Statistics - The South African Input-Output Table for 1967. - Unpublished.
4. Sadie, J.L. 1973. Projections of the South African Population; published by the Industrial Development Corporation of South Africa Limited.
5. TARR, M.A. 1975. An Input-Output Study of Labour Requirements in South African Agriculture - Unpublished M.Sc. Thesis, University of Natal.
6. Standard Industrial Classification of Economic Activities issued by Department of Statistics. Pretoria.

TABLE A1.1 KEY TO COMPOSITION OF INDUSTRIES IN 1967 INPUT-OUTPUT TABLE

SECTOR	S.I.C. CODE (6)	SECTOR	S.I.C. CODE
1 Agriculture, Forestry and Fishing	1	27 Rubber Products	355
2 Gold and Uranium Ore Mining	24	28 Other Plastic Products	356
3 Coal Mining	21	29 Glass and Glass Products	362
4 Other Mining	22, 23, 27, 28, 29	30 Other non-metallic mineral products	361, 369
5 Meat Dairy Products & Fish Processing	3111, 3112, 3114	31 Iron & Steel Basic Industries	371
6 Grain, Sugar and Animal Feeds Processing	3116, 3118, 3122	32 Non-ferrous Metal Basic Industries	372
7 Other food processing	3113, 3115, 3117, 3119, 3121	33 Structural Metal Products	3813
8 Beverage Industries	313	34 Other fabricated metal products	3811, 3812, 3819
9 Tobacco Products	314	35 Agricultural Machinery & Equipment	3822, 38291
10 Wool Scouring, Cotton Ginning & Dyeing of Wool & Cotton	32110 - 32113	36 Other machinery, except Electrical machinery	{ 3821, 3823, 3824, 3825, 3829 except 38291
11 Spinning, Weaving, Knitting & Finishing of Textiles	32114 - 32116, 3212 - 3219	37 Electrical Machinery, Apparatus & Supplies	3831, 3839
12 Clothing	322	38 Radio & Television Equipment	3832, 3833
13 Leather and Leather Products	323	39 Motor Vehicles	38400, 38401
14 Footwear	324	40 Motor Vehicle Parts	38402, 38403
15 Wood & Wood Products	331	41 Railway Equipment	3852
16 Furniture	332	42 Other transport equipment	3851, 3854, 3855, 3859
17 Pulp, Paper and Paper Board	3411	43 Other manufacturing industries	386, 39
18 Paper Containers	3412	44 Electricity, Gas & Steam	41
19 Other Pulp, Paper & Paper Board Articles	3419	45 Water Supply	42
20 Printing & Publishing	342	46 Building Construction	51
21 Fertilizers & Pesticides	3512	47 Civil Engineering & Other Construction	52
22 Synthetic resins, Plastic Materials & Man-made Fibres	3513	48 Wholesale & Retail Trade & Motor Trade	{ 61, 620, 621, 622 portion i.r.o. trade
23 Other Basic Chemicals & Petroleum & Coal Products	3511, 35293, 353, 354	49 Motor Repair Services	{ 622 portion i.r.o. repair services, 38409
24 Medicinal & Pharmaceutical Preparations	3522	50 Transport, Storage & Communication	71, 72
25 Soap & Cleaning Compounds & other Toilet Preparations	3523	51 Other services	63, 8, 9
26 Paint & other Chemical Products	3521, 3529 except 35293		