

# EDUCATED UNEMPLOYMENT IN AFRICA: DIRECTIONS OF RESEARCH

by  
Teshome Mulat\*

## Abstract

*Reports coming out of Africa in recent years indicate a trend of worsening unemployment for leavers of the schooling system. This short article surveys the state of current research on the subject of educated unemployment in the continent. While attempts are made to cover the wide variations in reported writings, the survey makes a determined focusing on what may be termed as "economic" research. The conclusion drawn is that little else is done beyond the application of theories and generalizations already developed to describe and analyse the phenomena in Western countries. Attempt is also made to highlight a proposition already raised in the text by means of Sudanese data.*

## I. Introduction

It is hard to come by any report on employment problems in Africa in the 1970's which does not devote at least a few lines to the treatment of the unemployment problems of educated persons. This is quite a contrast to the prevailing situation in the sixties when the main preoccupation of new governments was with the expansion of educational facilities and the educating of African peoples.<sup>1</sup> Education figured prominently in the budgetary expenditure allocations, in the distribution of aids and grants from the rich countries and provided in many cases a most noticeable source of public sector employment in Africa. It was believed, not necessarily incorrectly, that economic development, cultural advancement, technological progress and military prowess were all functions of measured levels and rates of growth of "education".

The explosive phenomenon of "educated unemployment" in Africa has two additional characteristics. In every country which has produced reports on the subject, the level of educated unemployment is considered "excessive"; and this level, (and sometimes even its rate of growth), is projected as an increasing function of time. A second characteristic is that this increasing unemployment takes place in countries with the lowest literacy rates and in states with near stagnating economies.

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economists, policy makers and others were immediately at work attempting to explain the causes and effects of the new phenomenon and trying their skills at policy prescriptions. Since these endeavors are spontaneous outbursts of an uncoordinated nature, they are not easy to categorize or classify, and in general they do not lend themselves to a systemic treatment. In the following pages an attempt is made to outline some discernible lines of research on the educated unemployment problem in Africa. This short survey will mainly focus on research outputs characteristically indicating the participation of the economist.

## II. Problems of Educated Unemployment:

### Main Research Directions

Educationalists and economists have been researching for some time now along three lines. One area of major research concentration is the schooling system. The schooling system (including curriculum, school finance, teaching aids, student-teacher ratios, etc.) is critically examined and evaluated with a view to explaining the unemployment pressures building up in these economies and/or for purposes of providing solutions to such pressures within the schooling system itself. Many of these types of studies tend to blame the schooling system for the unemployment problems. They argue that the system is "colonial" and elitist. The curriculum in schools is said to emphasize the "liberal arts" which enhance the neo-colonialist "connection" and underemphasize the "sciences and technology" which are both relevant to secure employment and necessary for the material advancement of the African countries. Further, the education system is criticized for high wastage rates with an ever increasing number of students dropping out or repeating classes. It is also generally observed that education at each level is non-terminal and as a result represents costs to society in cases where students leave schools in pursuit of work. The sum total of this is that at present education is considered ill-suited to the needs of African countries and is criticized for being not sufficiently related to the world of work.

This line of argument internalizes the unemployment problem and seeks to find solutions within the schooling system itself. It underemphasizes the role of other considerations in causing educated unemployment and gives the impression that the problem would vanish if wastage rates are reduced, curriculum revised in favour of the "sciences", and if more vocational type of schools, (which presumably relate to the world of work) are instituted. However, there is no concrete evidence that such piecemeal treatments would attack the root of the problem.



Another common, and equally one-sided, approach is to put the blame squarely on the poor performance of African economies. So much of the "economic" research in this field has that tilt. The gist of the argument is that most African countries show unsatisfactory growth rates in employment determining factors, such as output, investment, aggregate saving, etc. The increasing unemployment of graduates and dropouts from schools, according to this view, has little to do with the schooling process as such and is largely explained by the inability of the economic system to generate sufficient demand for skills.

Such a view suggests that the problem of educated unemployment would be solved by a programme of economic expansion. Even if valid in the long run, the proposal would ignore short-run constraints to economic expansion in the form of scarce capital and inadequate supply of skills. There is also a vicious circle in the argument of whether the supply of skilled manpower is a cause or consequence of economic development. Furthermore, by putting heavy accent on capital investment, this assessment of "causes" would preclude the consideration of others from effective inclusion in the debates.

A third general category of approach to the treatment of problems of school leavers is contained in labour market analyses. This is not necessarily a delineated category from the second types. In general, these latter types deal with "marco" and "aggregative" types of studies. But in recent years there has been a focussing of attention on the behavior of labour markets; and the accumulation of literature suggests separate treatment. On the whole, the incorporation of the labour market factor as an independent variable affecting many economic magnitudes, (including unemployment), is of a very recent origin in Africa. Labour market analysis covers wide ranging fields of study. Apart from considerations of malfunctioning labour exchanges, generation of "wrong" labour market "signals", general inadequacy of labour markets to resolve labour surpluses and shortages, labour market studies include two subject areas which are assuming increasing importance in current African research. These are schooling decisions and what we may group as "other relevant considerations" pertaining to labour market behaviour. As regards the latter category, partly because it is of a relatively recent origin and also because of the variations in African research in the general area, separate treatment is in order.

Regarding schooling decisions, quite extensive use has been made in recent years of the calculus of the rate of return<sup>4</sup> from schooling for identification of unemployment causes and as a basis for suggesting remedial policy prescriptions. Within a few years, rates of return from education were computed for a large number of countries yielding



invariably similar results. It has been found that (a) generally speaking, rates of return calculated for different levels of education are different and (b) because of the subsidy enjoyed by the beneficiaries of higher education and due to education-related wage differentials, net private benefits of higher education exceed net social benefits.<sup>5</sup> Predictably, the policy prescriptions suggested by these results include redistribution of educational effort in favour of levels with relatively higher returns and adoption of policies that narrow the gaps between private and social signals. In the latter case, specific recommendations include reductions in education-based wage levels and reallocation of public spending from educational expansion to employment creation.

The critiques of human capital type of theories, including the rate of return calculus, are well-known and a large body of literature treats this subject.<sup>6</sup> Accordingly, we skip over to the treatment of the other aspects of labour market research which we have collectively dubbed as labour market behaviour studies.

### III. Labour Market Behaviour and Its Employment Effects

It has already been indicated that this is a rather new area of investigation in Africa. elsewhere in the developing world so little research has been done that it is not possible to study the employment effects of labour market behaviour. An international symposium on the functioning of labour markets in Latin America held in 1969 noted that no satisfactory theories and empirical knowledge exist and it sought to give initial research priority to case studies in the general area in the hope that at some future date it will be possible to extract generalized theoretical formulations.<sup>7</sup> A large international conference was held in 1974 to consider the workings of urban labour markets in LDCs.<sup>8</sup> Although a build up of some relevant literature is noted by then, there too, the conference expressed dissatisfaction with the present state of knowledge and underlined the importance of future research.

The introduction of the labour market variable and a revival of institutional economics to bear on the problems of education and employment in LDCs come at a time when the problems of educated unemployment are reaching politically intolerable limits and as a reaction to the failings of human capital type theories and conventional labour market theories to provide convincing explanations.

As taught in neoclassical economics, human capital theory would suggest that earning levels and employment depend upon labour productivity and that productivity itself is a positive function of "education" or "schooling". Obviously then, increasing unemployment (i.e. excess supply) of educated labour can be explained by a declining



demand for labour productivity. The motives for further education are also provided in this system by induced high pay levels for additional schooling.

The competitive labour market model would then provide for an automatic solution to the educated unemployment problem. In this model the effect of excess supply of graduates from schools would be to depress the wage rate which in the next cycle would discourage human capital investment and eventually restore a new "equilibrium" of supply and demand of educated labour at (presumably) a relatively low wage rate. In this system, educated unemployment is seen as a short-run phenomenon and solvable by an automatic downward adjustment of the wage rate.

The fact is that both the suggested motives for education and the automatic solutions of educated unemployment in LDCs lack correspondence to reality. For several years now, the unemployment of school leavers has persisted and with the pressures building up, (with no tendency towards automatic equilibrium solution), such theories are demonstrably no longer tenable. Already in the 1960's, under the influence of radial sociology, new approaches and interpretations of labour market behaviour were entering an "explosive" phase.

#### **(a) Education as a "Screening" Device**

In a number of capitalist-oriented countries, recent studies indicate that education, rather than serving primarily the purpose of "productivity", is in fact being used as a legitimate means by capitalist employers for selecting workers, (and to bar entry to others), into the different rungs of the job ladder. Hence the use of education restrictively as a screening device not necessarily related to labour productivity.

An aspect of this use of education is that over a period of time and as more and more members of a workforce get educated, employer's tend to upgrade the minimum educational requirements for a job. In Africa, a particular job which required no higher qualifications than basic literacy a few years back may now require, say, secondary school certificates. Theoretically, a limit to such use of education can be imposed. Assume the "existence" of a "maximum level" of schooling for a job and consider a gradual rise in the level of education of job seekers. When the level of education of all job applicants reaches the designated maximum level, education ceases to serve as a job screening instrument. Neither can Education be a screening device in situations where it is not possible to make educational distinctions between job applicants. But in less extreme and intervening situations, school certificates can be used to serve the purpose.



Bhagwati,<sup>10</sup> in his study, writes on the extensive use of education as a mechanism for job rationing by employers in India. He also indicates a gradual rise in the educational "tags" attached to a wide segment of modern sector jobs.

Although not usually supported by empirical evidence and well-proven cases, observations of the same type are widespread in Africa. In Swaziland,<sup>11</sup> a recent report shows that, particularly in the public sector, employment wage differentials (and employment) are tied to educational qualifications. Another report from Zambia states, "The paper qualification syndrome is omnipresent both in the general as well as the technical services. In the government sector... the salary scales are geared to paper qualifications obtained from the formal education system".<sup>12</sup> Education-based pay scales and employment practices are also common in French-speaking West Africa.<sup>13</sup> In Somalia<sup>14</sup> and the Sudan,<sup>15</sup> similar practices are strengthened by government policy to serve as the ultimate employer. The situation in pre-1974 Ethiopia was also similar.<sup>16</sup> Use of pay scales based on educational qualifications was widely practiced and the level of education determined prospects for employment and job security.

If education serves only a screening purpose and not the purpose of productivity, then the unemployment of school leavers may have direct political repercussions but not necessarily economic. Even if both productivity and screening-utility theories of education suggest the expansion of jobs as possible solutions to problems of educated unemployment, the purposes and motives are obviously different. The end results too are dissimilar. With the productivity theory of education, the increase in job opportunities yields increases in the stock of goods and services to be produced in an economy, *ceteris Paribus*. In the latter case, such job increases are not necessarily accompanied by growth of economic productivity.

#### (b) "Socialization" Effects of Schooling and Unemployment

Some studies put heavy emphasis on the "socialization" effects of schooling. Crudely stated, the thesis here is that different levels of education inculcate into the schooling subjects (i.e. students) varying types and dosages of values and attitudes that employers demand. These values and attitudes are conveyed by attributes such as docility, punctuality, discipline, etc. and in general refer to what educational psychologists term as the "affective" skills or measured personality traits.

So far, increasing evidence in support of a preponderant usage of personality traits imparted by the schooling environment in employment and pay decisions is being produced for some mature capitalist economies. In Africa too sociologists and others have been writing for some time



now on the "changing values of the African", on the personality molding objectives of colonial education, and on the general impacts of Western education on traditional value systems and attitudes to job preference and work.

Most writings on this subject in Africa are impressionistic and may not satisfy the clamor for hard evidence demanded by the trained empiricist. However, several circumstances suggest wide spread acceptance of changing attitudes and values of African students exposed to "western" education; and these changes have a lot to do with modes of living and preparations for work in the civil service and in modern industry. In these considerations the motives for further education are also induced by differing levels of "affective skills" produced by the schooling system and the associated employment and pay structures. In some circles it is the acquisition of these characteristics that are considered more relevant than "cognitive" skills imparted by the formal education environment for purposes of employment and earnings. Where such is indeed the case, increasing unemployment of school leavers has more to do with demand and supply of "desirable" personality traits than with the lack of acquisition of production skills. Since such traits can also be provided outside the schooling environment (e.g. family background, neighbourhood effects, etc.) the keen competition for limited jobs can not be won by school certificates alone.

### **(c) Labour Market Segmentation and Educated Unemployment**

Another line of research which is being introduced into the African scene is inspired by labour market segmentation theories. These theories had their origin in the advanced economies of the West where concentration of wealth, firm activity diversification, and firm sizes have attained behavioral patterns no longer explainable by orthodox theories of the labour market. To some extent segmentation theories are also being applied to explain the phenomenon of income inequities and unemployment in some LDCs with similar developmental characteristics.

Although there are many "segmentation theories" their essential features remain the same. The premise is that a labour market rarely represents a homogeneous formation. It is segmented. The segmentation may result from technological developments<sup>19</sup>, or it may be conditioned by controls of a social character.<sup>20</sup> Each segment has its own differentiated functions, wage scales, hiring criteria, promotion procedures and working conditions. The location in any one segment of the labour market determines pay structure and employment conditions. These pay and employment conditions themselves are often considered products



of historical circumstance and determined by exogeneous variables such as custom, monopoly power, bargaining abilities of work groups, employers' interest in and ability to control "developments" etc.

Segmentation theory represents a noticeable advance over the orthodox theories of the labour market. Instead of dealing with individual worker's behaviour (considered an identical microcosm of the society of workers) along income maximizing lines, it treats groups of workers whose similar fate in life is conditioned by their membership to a segment of the labour market. The Segmentation theory attempts to refute, "orthodox theory's assumptions that profit maximizing employers evaluate workers in terms of their individual characteristics and that all workers have a wide range of options among jobs and among different forms of training".<sup>21</sup> It no longer accepts the notions that education-productivity - wage linkages exist in fact and are necessary to explain the functioning of a labour market system.

In recent years segmentation theories have been applied to explain the phenomena of modern sector pay and employment behaviour in some South Asian cities.<sup>22</sup> In Africa too attempts have been made to classify some labour markets. The Kenya Report<sup>23</sup> has popularized the dichotomy of urban labour markets into formal and informal sectors (segments). K.Hart has identified such discontinuities and irregularities (or lack of homogeneity) which existed in West Africa even earlier. In a recent seminar in Accra prospects for indepth review of labour market segmentations for policy (including the towns: Accra, Dakar, Lagos, Kano, Onitsha, Freetown) have been explored.<sup>25</sup> In these exploratory reviews the placement of increasing numbers of primary school leavers has been considered. While the need for more research is implied, the seminar papers seem to endorse the idea that if governments were to equalize opportunities between the formal and informal sectors (e.g. by government subsidy to the informal sector, provisions of equal access to credits, training, and technology, by all sectors, etc.) the informal sector could be revitalized and developed to absorb increasing numbers of job seekers including school leavers. An earlier study of Abidjan<sup>26</sup> has found analytical utility in the division of the labour market into formal and informal sectors. It also sees great prospects for the informal sector in a supplementary role (to the modern sector) as a producer of labour intensive goods and services and as employer of residual educated labour force. Another meeting of African scholars and representatives of workers' and employers' associations has this to say about the informal sector in Eastern Africa:

"The 'informal sector' of urban labour markets in East Africa was stressed as an area where the government could exercise its investor and regulatory roles effectively. This sector (best by de-



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fnitional problems) was reported to have great potentialities in production and in the generation of services and other useful economic outputs. Its potentialities in areas of training for the arts of commerce and craftsmanship and for developing other skills were given special mention. It was felt that in its drive to solve problems of mass poverty and to introduce desirable distributional patterns, government should pay special attention to this sector as a source of productive employment."<sup>27</sup>

Beyond these little advance has been made in the application of labour segmentation theories to bear on the problems of educated unemployment in Africa.

#### (d) Job Aspirations (Expectations) and Unemployment

To some degree the increase in the unemployment levels of young men and women leaving the schooling system in African is attributed to their own pattern of job choice. Bairoch, generalizing about the employment impacts of the behaviour of the educated in LDCs writes, "The lower rate of unemployment among illiterates is due in particular to a stronger tendency to emigrate among educated young people who, in view of their training, are obviously reluctant to take jobs which have a low social status but which illiterates are willing to fill."<sup>28</sup>

M. Blaug *et. al.* have indicated some degree of accentuation of the unemployment problem in India by similar reluctance on the part of graduates to take up jobs they consider socially unacceptable.<sup>29</sup> Similar group preference of unemployment (zero wage) to employment in low grade occupations (with positive income) has been observed in Ceylon as well.<sup>30</sup> J. Versluis has studied in some detail the variations in job expectations between secondary school leavers and university graduates in a Latin American setting.<sup>31</sup>

The imbalance between availabilities of jobs and student expectations and the employment effects of these considerations do not constitute well studied subjects in Africa. For example, the extent to which such a consideration is a relevant cause of educated unemployment in any African situation has not been empirically investigated. There are also many unclear issues. One may need to know whether or not school leavers have "unrealistic" expectations of occupations and jobs (see Appendix). If their expectations are "realistic" the cause of their unemployment could be seen to be other than their assumed behavioural inflexibilities. On the other hand, it would prove academically interesting and policy potent if one were to measure the differential between job availabilities and job expectations.



However, although lacking in empirical evidence (along the lines suggested above), official pronouncements of the unemployment problems created by "wrong" expectations echo throughout Africa. The Kenya Report writes:

"The school leaver problem is not in our view the result of a simple excess of school leavers each year over the number of jobs requiring school qualifications. True, this excess is large and has been growing very rapidly. But the particular reason why school leavers are a problem, why they are frustrated, and why an increasing proportion of them are seeking work, is not so much that opportunities do not exist, but that the opportunities open are not attractive in relation to those obtained by persons with comparable qualifications only a few years ago."<sup>30</sup>

A report on Zambian unemployment problems notes that, "... The high percentage of (unemployment) were believed to be due to the unrealistic expectations of Form V leavers."<sup>33</sup> A somewhat detailed study on job expectations of graduates from higher institutions in the Sudan shows clearly that students leave schooling with certain expectations regarding jobs and incomes and that they would undergo long waits with implied costs until their expectations are met.<sup>34</sup> Similar generalizations about the unfavourable employment effects of attitudinal rigidities of school leavers are also noted in many other reports in Africa.<sup>35</sup>

An aspect of school leaver behaviour relevant to the present consideration and contained in almost all these reports is that in a large number of cases school leavers "hold out" for modern sector jobs for varying periods of time and eventually settle for relatively "low" occupation jobs. Apparently the better educated are likely to experience (on the average) shorter waits than the less educated. A Study by Diejomaoh and Orimalade in Nigeria<sup>36</sup> suggests that the duration of unemployment could exceed two years for primary school leavers. Most find refuge eventually in the informal sector as apprentices. However, the same study indicates that to secondary school leavers apprenticeship in an indigenous system of work is total anathema. The duration of unemployment apparently depends, therefore, on school leaver expectations regarding modern sector job availability and the availability of second best alternatives in the informal sector. A report on the employment problems of Ethiopia suggests two additional possible determinants of the duration of educated unemployment.<sup>37</sup> These are the cost of job search and the size of joint family resource pool that can be earmarked to finance that cost.

#### IV. Research Perspectives

Much of the reporting on the problems of education and employment, as we have seen, is swamped in generalities. At the present time formal application of theories and empirically substantiated analyses



are rather restrictively applied to studies pertaining mainly to the schooling system and to some extent in areas of schooling decisions. Even these are not performed for all African countries nor for many years. No doubt many of the cliches, hypotheses, generalizations, and theories produced elsewhere will continue to be adapted and tried to explain the phenomenon of educated unemployment in Africa. Their worth will be measured and ascertained as the present paucity and inadequacy of data is overcome.

Certain other areas of research and methods of approach would also prove useful in the future. An area worthy of exploration in African labour market research is the case study method. The application of this method is likely to bring out the unique characteristics of a labour market and help identify the operative variables therein. It is one of the more fruitful areas of research which can be exploited to explain the causes and effects of educated unemployment and for purposes of developing pertinent policy recommendations suitable to specific situation.

Another such area is the "comparative method". At the present time there are too few studies of this type that can shed some light on the relationships between education and the world of work in Africa. Comparative methods help to highlight the differences and similarities between systems and in the process identify key variables determining relationships. This method of study is also useful as an analytical framework for the development of policy and in the consideration of transfer of experiences in solving labour market problems between countries.

Finally, the present state of research in the area of education and employment in Africa is lacking in the application of Marx's method. This deficiency can be seen in the rather ineffective policy parameters or in the conflicting policy prescriptions often generated by present research. In as much as present approaches can be accused of obscuring important and sensible issues and questions in the understanding of the phenomena of educated unemployment the relevance of Marx's method is to be appreciated. The impacts of resource ownership and associated distributional patterns on these problems may have to be investigated. There is a need to show the class character of the general problem. Educated unemployment problems are simply one of the outward manifestations of in-built internal contradictions and general malaise of the African economies. The conventional approach to the problem very often treats the issues in the framework of models that assume neutral roles of governments and/or are mute regarding the "location" of African countries in the scheme of international economic relations. All these institutional, political, and economic linkages and relations should be



brought together in a Marxist frame of analysis to shed light on the issues, problems and policies of education and employment. That constitutes another fertile ground for future research.

### V. Appendix

In 1974, a household socioeconomic survey was carried out in the Khartoum area (of the Sudan) by an ILO team of researchers. The aim of this short note is to use the paper results to probe an issue already raised in the text of this survey - school leaver job expectations and availabilities. More specifically the issue we examine here is whether or not the job choices of leavers of the schooling system correspond to their availabilities.

The Sudanese survey data gives information on occupational breakdowns of persons already employed in the urban economy in relation to their education levels. A percentage distribution of wage-earners among occupations can be computed for each level of education. These percentages or ratios are the probabilities of employment (i.e. probabilities of getting jobs) in the various occupations given the level of education and can be used as proxies for labour market job possibilities. These are, of course, probabilities relevant for *eo tempore* considerations.

Unemployed persons seeking jobs in the Khartoum area were also asked to indicate their job preferences as well as their levels of education at the time of job applications. From the data so obtained it is possible to compute the percentage distributions (or ratios) of total job seekers of a given level of education among occupations sought. These probability ratios are proxies for job expectations.

If job seekers are responsive to labour market signals (in the sense that they sense and obey market rules) then their job expectations correspond to job possibilities in the labour market. We may hypothesize for these groups of participants that their job expectations (designated, E) can be written as positive functions of the labour market possibility index (designated, L) i.e.,

$$E_j = f(L_j) \dots\dots\dots(1)$$

where the subscripts refer to the occupation categories (1,2,..., n) If we assume a linear relationship and expect the correlations to be significant and positive in sign, we may specify,

$$E_j = a + b L_j + U_j \dots\dots(2)$$

with  $b > 0$

where a and b are constants and where  $U_j$  is the random disturbance error with the usual assumptions of zero mean and a constant variance



The application of the Sudanese survey data to model (2) above is reported in the Table below.

*Regression Results: Job Expectations (E) As A Function of Labour Market Possibility Indicator (L)*

Education Level (1)	a	b(2)	R(3)
0	-1.01	1.09 (4.955)	0.88
1	-2.53	1.24 (6.201)	0.92
2	4.53	0.61 (6.101)	0.92
3	-5.79	1.52 (3.707)	0.81
4	-5.08	1.46 (14.600)	0.93
5-6	-4.99	1.45 (14.500)	0.98
7	1.79	0.84 (3.818)	0.81

Notes: (1) *The Levels of Education are:*

0=*no formal education (illiterate)*

1=*Primary not completed*

2=*Primary completed*

3=*Secondary not completed*

4=*Secondary completed*

5=*Higher technical*

6=*Other higher*

7=*University completed*

(2) *The figures in brackets are computed t-values*

(3) *R refers to the correlation coefficient.*

All the b values (and therefore the R values in this linear model) above are significant at the 0.01 level. According to these results the probability ratios the unemployed persons attach to their job expectations correspond to the probabilities of getting the jobs. This is so irrespective of the Level of education. Clearly then job seekers in Khartoum appear to obey market signals and do not seem to make unwarranted job choices. Their prolonged unemployment need not necessarily, therefore, be attributed to "wrong" job choice (as defined here) and it may do well to explore some other explanations for educated unemployment in the Sudanese urban labour markets.



## NOTES AND REFERENCES

1. A timely expression of this preoccupation is contained in: *Final Report of the Conference of African Ministers of Education in Africa*, (Addis Ababa 1961). The term "educated" applies to persons with varying levels of formal education and "educated unemployment" often refers to job seekers leaving the schooling system with at least some secondary level education. See, M. Blaug, *Education and The Employment Problem in Developing Countries*, (Geneva: ILO, 1974). See also, Teshome Mulat, *Educated Unemployment in the Sudan*, (World Employment Programme Research, Education and Employment, Working Paper, NO. 5, Geneva: ILO, 1975) pp. 9, 10.
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