OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche

07548

Distr.
RESTRICTED

UNIDO/IOD.94
5 July 1977

ENGLISH

UNITED NATIONS INDUSTRIAL
DEVELOPMENT ORGANIZATION

DEVELOPMENT OF INDUSTRIAL MANAGEMENT AND TECHNOLOGICAL CAPABILITIES IN DEVELOPING COUNTRIES 1/:

THE CASE OF GHANA. (1977).

by

D.W. Prah*
L.Y. Banini*
F.W. Lukey*

---

* Department of Economics and Industrial Management, University of Science and Technology, Kumasi, Ghana.

1/ The views and opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the Secretariat of UNIDO. This document has been reproduced without formal editing.

id.77-4648

C O N T E N T S

1. INTRODUCTION

This paper is based on principles which have gained wide currency in the literature on economic development and are also generally held as tenets by economic planners in developing countries. The first of those principles derives from the theorem now widely supported by empirical evidence that as an economy advances, the relative contributions to gross domestic product made by its three broadly categorised sectors, namely, primary (agriculture), secondary (manufacture) and tertiary (services), undergo a secular change, with the primary sector's contribution steadily declining and those of the other two demonstrating constant increases.[1]

The widely acknowledge association between expanding industrial sectors and increasing per capita incomes as hitherto exhibited in the historical development of the advanced countries has led many low-income countries to the belief that the best way to improve upon their low standards of living is to resort to industrialisation. It appears the tendency for the developing countries to industrialise is irreversible, despite the dissent which has been registered by some economists that the best means of achieving an improvement in per capita incomes in the LDCs is to secure increases in the productivity of the agricultural sector.[2]

---

1. Colin Clark: Conditions of Economic Progress (Macmillan 1957) and Simon Kuznetts "Quantative aspects of the Economic Growth of Nations II Industrial Distribution of National Labour Force in Economic Development of Cultural Change Vol.5 supplement.

2. S.R. Sen: "The Strategy of Agricultural Development", Asia Publishing House, London 1962 and W.W. Rodda Way: External Capital and Self-help in Developing Countries in PROGRESS Vol. 51 Number 286 1955/56.

This paper does not examine the pros and cons of the "agriculture vrs. industry issue" but rather takes as a datum that industrialisation is here to stay and that many LDCs, including Ghana, expect much by it. The pertinent question to consider relates to the appropriate industrialisation strategy that is to be adopted in order to achieve certain declared objectives as efficiently as possible from the standpoint of both resources and time. Suffice it to say, however that without a well-developed agricultural sector the success of a developing country's industrialisation programme is bound to be illusory. It is for this reason that some growth theorists have advocated for an approach to economic development which lays stress on a proper and flexible balance between the agricultural and the manufacturing sectors.

In addition to the principle enunciated above, reference is made to a second one which focuses attention on the form and manner industrialisation should assume, especially for "late starters". In this regard, attention is drawn to the congeries of features which one observer has noticed of the industrialisation experience of the Eastern European countries when they set out to industrialise their economies in the latter part of the 19th century. According to him, the general characteristics are that:

(i) The higher the degree of backwardness of a particular country, the more pronounced was the emphasis laid on the use of large plants and enterprise;

(ii) the more a country's industrial development was delayed, the more explosive was the spurt of its industrialisation process, if and when it occurred;

(iii) the more backward a country, the greater was the tendency for its industrialisation programme to be undertaken under some organised direction, and

(iv) the more backward a country, the greater the likelihood that it would opt for capital goods rather than consumer goods industries.[3]

3. A. Gerschenkron: Economic Backwardness in Historical Perspective (Praeger 1965).

Whilst it is likely the other late starters on the road to industrialisation may exhibit some or all of the characteristics listed above, it is by no means assumed that all these characteristics are features that should be considered as indispensable manifestations. Though it is often said that countries that are industrially backward can reap the "advantages of backwardness". In the sense that they need not go through the slow intermediate stages of industrial development that the advance countries of today went through, it must nevertheless be said that the exigencies of time and place may be such that the industrial success story of each country may most probably turn out to be unique.

Successful industrialisation, among other things, requires the right combination of the following cooperant factors: raw materials; human resources encompassing a wide spectrum of skills (each at different levels of accomplishment); the artifacts of man, including machinery and, finally, entrepreneurship. The absence or shortage of anyone of these factors may either completely foil or impede a successful industrialisation programme. This consideration inevitably leads us to our third principle - the significance of manpower in industrial development.

It is often pointed out that the progress of a country depends primarily on the progress of its people. It cannot indeed be gainsaid that no country can make any material advance if it does not first develop the potentialities and the spirit of enterprise of its people. For industrial development to proceed satisfactorily, investment in human capital has to be recognised as an important requisite. Very much needed are such categories of labour as technologists, supervisors, maintenance and production engineers, statisticians health supervisors, to name only a few. But besides these, we need other men to perform various types of entrepreneurial functions.[4]

---

4. The components of entrepreneurial functions can be grouped as follows:
   (i) Business promotion;
   (ii) capital provision and risk bearing;
   (iii) organisation and management of an enterprise
   (iv) technical innovation and/or adaption.

With regard to organisation and management, one observer is of the view that differences in organisation account for differences in labour productivity. He notes that in modern Egyptian factories with technology the equivalent of those in the United States, labour productivity is about one-fifth that of the United States, and he attributes the difference to quantity and quality of organisation. In egypt, managerial resources are scarce and managerial methods are primitive.[5] So it is in other developing countries including Ghana.

To facilitate the embodiment of technology and managerial skills in labour through relevant education, capital in the sense of equipment and money has to be provided. It is in-between adequate education and insufficient capital that developing countries are caught in a vicious circle of under-development. A three-pronged stimulus in the form of education, institutional adjustments and external aid is therefore needed to break the vicious circle and usher in an era of rapid economic development in developing countries.

Approaches Adopted in Different Countries

The development of managerial and technological capabilities during the past three centuries in the countries that are now developed occured under conditions that ranged from laissez-faire to central planning. During the first industrial revolution in Britain a number of businessmen established and managed their own industries out of experience which followed "learning by doing". The techniques of production which were invented by practical men with ideas were converted into innovations in industries.

As the first nation to industrialise, Britain had no country to copy from. At the time the industrial revolution was taking place, no one had any provision of its tempo nor could anyone tell from the constellation of problems accompanying the process of industrialisation which ones were inevitably concomittant and which ones were not. It was only at a later date that, in retrospect, some of its features came to be labelled as the "prerequisites" of modern industrialisation.

---

5. F.H. Harbison: "Entrepreneurial Organization as a Factor in Economic Development" in Quarterly Journal of Economics, August 1956.

One other striking thing about the British experience is that no one had an over-view of what was happening, although many revelled about the material prosperity that was resulting from it.

The U.S.S.R. and some Eastern European countries from the latter part of the 19th century to the present day and China during the present century have all adopted a planned approach to industrialise their economies. As part of their strategy they have concentrated on the development of managerial and technological skills. The spurt of their industrialisation process, as indicated earlier on, has been explosive, partly as a result of direction from the centre and partly in consequence of the use of large-scale plants. The urge to close the "gap" that exists between themselves and the leading industrialised countries has been pulsated under governmental leadership. In the process as much opportunity as possible, has been taken to reap the "advantages of lateness".

The economic development of Japan after the Meiji restoration of 1968 was also contrived and directed. Under the leadership of the samurai, Japanese technology and education were westernised and geared to produce towards the much needed modern skills for the manufacturing sector.

Germany, France and the United States did not experience centrally created industrial development, but they nevertheless had to make some major adjustments in their educational systems when they found themselves at the beginning of the 19th century lagging behind Britain in the process of industrialisation.

Experience in U.K. Today

The business philosophy that prevailed in Britain during her industrial revolution generated activities based on free enterprise and as a consequence the institutions which evolved to provide common services to the pioneering industrialists were few. The passage of time has, however, brought with it some changes. Twentieth century Britain has developed a wide variety of institutions to support the diverse activities that go on within her manufacturing sector.

As the business world becomes more complex, these institutions go on proliferating. Some of them have been of great benefit to the execution of managerial functions whilst others have resulted in the acceleration of technological development. Of the many such institutions reference can be made to a selected few:-

(i) Markets:

Various markets provide management with diverse services which lessen considerably the problems that otherwise would make the business of running an enterprise difficult. The commodity markets supply firms with information including that dealing with the relevant price options of a wide range of raw materials which are used as inputs. The money and capital markets for their part place at the disposal of businessmen funds which through their operations they are able to siphon from the private savings of households.

(ii) Provision of Data and Other Types of Risk Minimising Information

If the businessman is to attain the objectives he is planning for, he should be able to base his decisions on accurate information about the environment in which he is operating. Britain today can boast of many agencies that either provide statistical information on request or issue periodically publications containing articles and data relating to a multiplicity of topics of direct concern to the businessman, e.g. price trends and market demand, wages, foreign competition, external trade reports, etc.

(iii) Research and Development (R.& D.)

The combined effects of basic and applied research and development work have spurted the rate of industrial progress of the leading industrialised countries and are widening at an ever increasing tempo what has become known as the "technological gap" between the advanced and the less developed countries.

The different activities of R.& D., from the pursuit of invention to the improvement of existing products, have put the British industries in a position where they can now reap very great pecuniary benefits that arise from external economics.

The provision in Ghana of facilities such as those mentioned above should be regarded as a sine qua non of any meaningful programme for the development and performance of the country's managers and technologists.

Growing Movement for Advanced Education in Britain

An important development in Britain in recent years is the growing importance which is now being attached to business education. British educational traditions have in the past been strongly against the view that education for business is anything but respectable. This view is now slowly but certainly giving way to a more enlightened one under pressure of the success story of the Americans all the world over. British industry now recognises the significant role which management studies have to play in national development and are preoccupied with taking appropriate measures to improve the quality of their business schools and management training offered by other educational institutions.

It is now being realised in Britain that the country's ability to maintain her rightful place among the industrialised nations is certainly predicated on the extent to which she will be able to produce necessary top-level managerial manpower to control and direct her already acquired technological capabilities.

The Choice of Ghana

When Ghana attained political sovereignty in 1957, she had one of the highest per capital incomes in tropical Africa. Richly endowed with natural resources, she was considered by many economic observers to be well set on the road to a high level of economic development. To diversify the economy of the country, the Government set up many industrial establishments, but unfortunately, the programme came to grief.

Since then one of the widely suggested causes of the failure has been the fact that the country attempted industrialisation without the prior build up of managerial and technological infrastructure. In deed, the management bottleneck and its harmful effects on the industrial progress have long been recognised by the Government and this can be attested from statements made in many official publications.

If Ghana can be helped to acquire a rate of economic development commensurate with her investment efforts through the rectification of the mistakes she has made since she first embarked on her industrialisation programme, she can then become an example to other countries with similar economic characteristics and aspirations.

Financing

To finance the development of management and technological capabilities in Ghana, the Government has used mainly its annual budgets from the time of the Nkrumah regime. The funds provided have been supplemented with foreign aid and technical assistance from friendly countries and international agencies, e.g. Britain, Canada, United States, USSR, IBRD, UNDP, etc. etc. This financial policy is in keeping with the dominant principle entrenched in the International Development Strategy adopted by the United Nations General Assembly for the 1970s which prescribes that the LDCs should themselves shoulder the main responsibility for meeting the financial costs of developing their respective economies. But it is nevertheless pertinent to state that aid from external sources has so far been very inadequate.

II. GHANA'S EXPERIENCE SINCE 1947

GENERAL APPROACH AND DEVELOPMENTAL PROGRAMME

Industrialisation has been one of the pre-occupations of the government of Ghana since 1947. It was the conviction of the Nkrumah government that rapid industrialisation would lend greater adaptability and flexibility to the country's economy and also help to improve the standard of living of Ghanaians as quickly as possible. Two development plans were therefore launched during the periods 1951-56 and 1959-64, the main aim of which was the provision of basic infrastructure which was to act as a backbone to the industrialisation scheme envisaged.

A number of good roads and secondary schools and teacher training colleges were accordingly built. In the 1960s some vocational and business/technical colleges were also established.

In 1964, the Seven-Year Development Plan (1963/64 - 1969/70) whose development strategy could be summarised in one word, industrialisation, was launched, but the plan as far as the manufacturing sector was concerned got off to a poor start, mainly through the slow generation of projects; and the blame for the failure has been laid at the door of management.

> "Government investment in industry, agriculture, transport, commerce and banking is already substantial by any standard. What is now most urgently required is management to make these investments pay off both from the national and commercial points of view.[6]

It is appropriate at this juncture to mention that industrialisation in Ghana was not preceded by widely conducted public debates designed to inform the people. No views were aired on the variety of alternative choices that were open to the country in respect of manufacturing strategies: whether industrialisation was to be import-replacing or export-oriented; whether the technology to be adopted should be labour-intensive for employment purposes or capital intensive in view of the desire of the country to catch up with advanced countries and whether the scale of plants to be used should be large or small. Locational issues and their effects on the cost of manufacture were not examined. The industrial programme was not translated into individual projects and the soundness of each tested in terms of manufacturer requirements, i.e., on the basis of the different categories of personnel to be engaged: managerial, technical and supervisory, skilled and unskilled.

In the 1950s, the industrialisation programme of the country was mainly confined to the purchase of plants and machinery from abroad and their subsequent erection locally. Very little attention was paid to management training by the Government.

---

6. Office of the Planning Commission, Accra: 7 Year Development Plan, Annual Plan for the second Plan Year, 1965 Financial Year, P.11.

In a country where the public school type of education with its literary orientation was the norm, the thinking of those in authority gave the impression that competent managers for industry could be produced by the same educational mill that turned out classical scholars. For after all, is it not a common saying that education is what remains when one has forgotten all that one learnt at school? But the rampant failures of the state enterprises in the 1960s forced the Government to re-orient its thinking on the management question and to take remedial actions.

At first the Government thought that the problem could be solved by simply entrusting the administration of the state enterprises to a government department. With this object in view it created the State Enterprises Secretariat. This was indeed half-hearted action. When a country is confronted with a difficult economic problem arising from inadequate supply or complete absence of competent managers, the right solution for rectifying the situation is not to takeover the running of business enterprises from the hands of private businessmen and entrust it to civil servants who are no better at managing profit making enterprises than non-civil servants. The proper course of action is to take positive action to train the required cadre of managers in the requisite fields. From 1964, the Government took measures to establish a number of institutions to train and supply the industrial sector with the needed high-level and skilled manpower; the most outstanding of these institutions is the Management Development and Productivity Institute (M.D.P.I.) in Accra.

Principal National Institutional Infrastructure

The chief institutions for the training of managers and technologists in the country can be grouped into two broad categories: (a) the non-University institutions, which include M.D.P.I., and Ghana Institute of Management and Public Administration (G.I.M.P.A.) and (b) the University institutions which comprise the School of Business Administration, Legon and the University of Science and Technology, Kumasi.

Management Development & Productivity Institute

With regard to management training, the M.D.P.I. which was established in 1964 with the name of National Productivity Centre, (N.P.C.) has since then widened the scope of its activities and has now become the principal national institution in the field of management. The over-riding objective of the Institute has been the promotion and development of the standard of management in all sectors of the country's economy and it has sought to achieve this objective by providing training in management, conducting research and giving advisory services.

From 1968-71, M.D.P.I. conducted over 300 course seminars and workshops for participants of all levels. These courses, etc. were organised with special reference to modern management practices and productivity techniques.

The consultancy services provided by M.D.P.I. include profitability studies, budgetary controls, financial management, accounting systems, job variations and production engineering. By the end of 1974 it had completed 89 consultancy services covering a very wide range of techniques. Inplant consultancy has been planned as a result from different sections of the manufacturing industry. The M.D.P.I. runs the basic industrial engineering courses of 10 weeks duration once a year. This it is able to do as the only Institute in the country that has provision for training industrial engineers and workshop technicians. The services of the MDPI with regard to consultancy will be fully appreciated when it is realised that it is making available to local businessmen at little cost specialised technical advice and information of new technical developments which would otherwise be unavailable to the small local businessmen.

Ghana Institute of Management & Public Administration

The Ghana Institute of Management & Public Administration was established in June 1961 and designated the Institute of Public Administration with the object of providing training courses for civil servants. In 1969 it was renamed the Ghana Institute of Management and Public Administration and the scope of its functions widened.

At the moment its programmes include

(i) the provision of education and training in the principles of commerce, industry and public administration and

(ii) the provision of management consultancy services.

With regard to its teaching programme much of its resources is devoted to public administration studies. Management is taught by one of its three constituent divisions and the object here is to run management development courses for the upper segment of middle-level management as well as to provide functional courses for a spectrum of management personnel drawn from both the public and the private sectors.

School of Administration, Legon

This school runs several courses at the degree as well as the diploma levels. The emphasis of its courses is on modern techniques of administration. The overwhelming number of its graduates eventually specialise as either corporate secretaries or accountants. The three main courses offered at the degree level are

(i) accounting

(ii) business management (formerly termed business administration) and

(iii) public administration.

One of the subjects offered for business management courses is production management. Between 1965 and 1971, both years inclusive, an average of 44 graduates per annum were produced.

University of Science and Technology, Kumasi

The University of Science & Technology produces the bulk of the country's graduate technologists: engineers (civil, chemical, electrical, geodetic and mechanical) architects, building technologists, bio-chemists pharmacists, physical planners etc. etc. In addition to these some diplomates are also produced.

The University's annual intake has been determined by the financial assistance it has been receiving from the Government.

With increasing awareness of the managerial responsibilities which might be assigned to its products some time after their graduation,

the University has accordingly taken steps to include introductory studies in management in some of the undergraduate courses.

In consequence of this awareness it created in 1971 the Department of Economics and Industrial Management and entrusted it to promote and develop, among other things, management studies throughout the University. The Department at the moment provides service lectures in Management to undergraduates of several Faculties and also runs a 12-month postgraduate course in Industrial Management for those who have had at least one year's postgraduate working experience in industry. It also organises the second-year management education for the M.Sc. programme in Wood Technology.

It is pertinent to mention the relationship which has been established between the various teaching departments and the Technology Consultancy Centre of the University. The Centre's activities and achievements to date are dealt with below; but it is apposite to say here that through the Centre the expertise of the various Departments, both managerial and technological, is being made available to the public.

OTHER GHANAIAN ORGANIZATIONS INVOLVED AND THE PART PLAYED BY EACH INSTITUTION

Council For Scientific and Industrial Research (CSRIR)

This was established by National Liberation Council Decree 293 of 1968 and was charged with the responsibilities of advising the Government on scientific and technological advances likely to be of importance to national development; advising other agencies of government on scientific and technological matters affecting the utilization and conservation of natural resources of the country and on how best scientific research may be co-ordinated to expedite economic development; encouraging scientific and industrial research of importance to the development of technology, agriculture, industry and medicine and co-ordinating research in all its aspects in the country. It is also the Council's responsibility to undertake the collation, publication and dissemination of research results.

In the execution of its functions it has set up a number of research institutes, units and projects some of which undertake research studies on roads, building construction, wood processing, food processing, soil, water and herbs of Ghana to mention only a few of them. The CSIR is therefore the institution that is expected by the government to play a leading and important role in the Research and Development programme of the country.

Technology Consultancy Centre at UST, Kumasi (TCC)

Established in January 1972, the TCC aims at extending the expertise in the teaching and research departments of the University of Science and Technology to the solution of problems in industry, agriculture and government departments. It offers advice to its clients on appropriate technology, identifies projects and prepares feasibility reports on them. So far the TCC has undertaken the production of soap, caustic soda, paper glue, school equipment, animal feed, steel bolts and nuts, textile products and traffic lights, etc. etc. It also provides consultancy services on such things as the survey and design of feeder roads and industrial sites, the repair of air conditioning plant, the valuation of assets, etc. Mention must also be made of the fact that the Centre uses the services of the Department of Economics and Industrial Management at UST and the NPPI in solving the management problems of its clients. Quite recently a member of the Department of Economics and Industrial Management was engaged by the centre to study the causes of low productivity in the steel bolt production unit. The TCC in its environment therefore has an important role to play in the development of technological and managerial capabilities in Ghana.

Centre for Development Studies, Cape Coast

In a sense the Centre for Development Studies is the TCC equivalent in Cape Coast. It was established in 1967 as a Social Science research outfit of the University of Cape Coast. Its functions include the preparation and implementation of research studies embracing the University's own research programmes and research projects in collaboration with other institutions.

It also endeavours to further understanding of problems of development and strengthen research orientation through seminars, presentation of case studies, supervision and advice on research etc. The Centre's priorities comprise agriculture, rural development, regional development, socio-economic aspects of educational development, choice of technology and project appraisal.

Since its inception, the Centre has conducted a number of research studies on behalf of various governmental and semi-governmental organizations to supply important data on certain critical sectors of the economy. Some of these institutions are the Ministry of Agriculture, Ministry of Education, Prices and Incomes Board, Central Regional Development Corporation, the TCC at UST, etc. Right now, the Centre is in the process of collaborating with the TCC in the field of fishing technology (outboard motors and vessel engines); it is already in close collaboration with the Institute of Development studies at the University of Sussex on educational selection.

The problems of the Centre are lack of equipment (Particularly transport and publication equipment) and inadequate research staff.

National Vocational Training Institute

This institute was established in 1969 with technical assistance from UNDP. It is not a school but an autonomous central agency set up primarily to co-ordinate all industrial and vocational activities in the country. The ultimate objective is to develop a national system of vocational training. In order to fulfil its short-run as well as long-term objectives, the N.V.T.I. occasionally studies the country's skilled manpower requirement in relation to its expanding economy and then draws suitable training programmes to provide these needs as indicated by the requirement of different sectors of the economy. In the training of the required manpower it lays emphasis on adequacy and suitability of both clerical and industrial manpower. The Institute trains people already in employment. So far it has trained more than 3,000.

Vocational Training

This is done in 3 types of vocational and technical training institutions: Polytechnics, (Accra/Takoradi/Kumasi), Technical Institutes (Koforidua/Asuase/Kokam/Sunyani/Kpandu/Tamale); Training Centres and Special Training Centres (Tarkwa School of Mines and Textile Training School at Tema).

Results Accomplished

During the 1960's the gross domestic product of Ghana increased at an average rate of 2.5 per cent per annum as against an average annual population growth rate of 2.7 per cent. This inevitably led to an overall decrease in real per capita income during the decade. In contrast to the disappointing performance of the economy as a whole, the manufacturing sector progressed satisfactorily, especially during the latter part of the decade. One estimate puts the average annual growth rate of the larger manufacturing enterprises at 15% for the period 1962-1970, when output is calculated in constant prices. The growth rate of value added of the same enterprises for the same period was 13 per cent, also calculated in constant prices. The performance of the manufacturing sector would even have been much better, had this not been vitiated by the effects of shortages of manpower with managerial and specific technical skills.[7]

In the early 1960's it was very much feared that not much attention was being paid to the training of technicians of the middle-level grade. This over-sight, had it not been put right, would inevitably have produced a situation which would have led to the ineffectiveness of top management and high-level technical personnel, thereby creating a double-barrelled constraint on the growth of the manufacturing industry.

---

7. Since the beginning of the 1960's Ghana has made some determined efforts through the NDPI and others to produce some of her top-level manpower requirements, but the output so far has not been sufficiently adequate to satisfy the ever increasing demand.

The increase in the number of people admitted for technical and vocational training in the middle 1960's has contributed considerably to the appreciable improvement in industrial skills recorded in recent years. For example between 1962 and 1970 in spite of the fact that employment in the large-scale manufacturing enterprises expanded at an average rate of growth of 8.4 per cent per annum, productivity (value-added per worker) grew at 4.4 per cent per annum.

Problems Encountered

Though much has been done to increase the supply of high-(and middle)level personnel in Ghana, the rapid expansion of the country's manufacturing sector since the beginning of the 1960's has not led to the easing of the shortage of top-level manpower.

Table 1 shows that in 1968 in spite of resorting to expatriate employment to fill the gaps, there were still a number of vacancies in establishments employing more than 10 persons. The most recent vacancies are detailed in Table 2.

Table 1 HIGH LEVEL & SKILLED INDUSTRIAL MANPOWER 1968- SELETED SAMPLES

	Current Employment (1968)		
Title of Occupation	Total	Non-Ghanaian	Number of Vacancies
Electrical Engineers	150	36	15
Chemical Engineers	3	3	-
Mechanical Engineers	293	125	24
Metallurgists	6	1	-
Draughtsmen	959	6	1
Technologists	300	5	4
Technical Managers	459	173	70
Managers	1,299	306	68

Source: High-level and Skilled Manpower Survey in Ghana - 1968 and Assessment of Manpower Situation (1971) - Publ. by Manpower Division, Development Planning Secretariat, Accra, 1971.

Table 2: SOME GRADUATE CATEGORIES IN WHICH SHORTAGES ARE FORSEEN FOR PERIOD 1973 TO 1975

Category	Govt.	Local Self Govt.	Pub. Corp	Private	Total	Expats as at 1975	Total jobs open 1973-75
Economists	56	nil	33	nil	89	2	91
Accountants	36	70	84	11	277	56	333
Gen.Managers	2	nil	12	35	49	297	346
Prod.Managers	nil	nil	20	11	31	85	116
Sales Managers	nil	nil	9	13	22	35	57
Trans.Managers	2	nd	nd	nd	2	3	5
IR & Personnel Managers	nil	nil	6	5	11	7	18
Other Manag.NEC	nil	nil	12	15	27	98	125
Farm Manager	1	nil	4	10	15	nil	15
Chemists	3	nil	29	3	35	4	39
Physicists	nil	nil	21	nil	21	1	22
Geologists	26	nil	3	nil	29	9	38
Meteorologists	18	nil	nil	nil	18	nil	18
Architects & Town Planners	94	nil	19	nil	113	11	124
Civil Eng.	48	1	38	92	179	34	213
Electric & Electron Eng.	1	nil	25	11	36	46	82
Tech. Eng.	nil	nil	11	nil	11	3	14
Mech. Eng.	22	nil	37	16	75	118	193
Chem. Eng.	nd	nd	20	nd	20	8	28
Metallurg. Eng.	nil	4	2	6	4	10	
Mining Eng.	6	nil	20	nil	26	18	44
Ind. Eng.	nil	nil	5	10	15	24	39
Agric. Eng.	12	nil	1	2	15	2	17
Irrig. Eng.	17	nd	nd	nd	32	nil	32
Textile Eng.	nil	nil	2	3	5	31	36
Othe. Eng. NEC	3	nil	nil	5	8	21	29

NEC = Not Easy to Classify nd = No Data

Source: Draft copy of Ghana Comprehensive Manpower Survey 1973, Ministry of Economic Planning.

It is apparent from the pronouncements of the Government in some of its publications that the university institutions have not been adjusting themselves too readily to the task of finding solutions to critical contemporary problems of national significances:-

> "The Ghana Government recognises the need for university autonomy in basic academic matters. This entails a reciprocal responsibility on the part of the universities to discharge their obligations to the whole society which maintains them.
>
> In this respect the universities must ensure that their teaching and research are related to topics and problems of national importance".[8]

With regard to management training at least one of the university institutions on its own initiative evaluated the situation and decided to take steps to rectify the situation, but so far the proposal is yet to be seriously implemented:-

> "In Ghana it often becomes necessary to put young graduates in positions of responsibility at a relatively early stage in their career. It would therefore seem desirable to introduce subjects like
>
> General/Industrial Management
> Human Relations
> Applied Economics
>
> to all the degree courses to enhance the training of students in this University. During its visits to corporations and industries, the Committee, was given examples where young graduates of this university had been having difficulties with persons working under them".[9]

---

8. Ghana Government: Two Year Development Plan; From Stabilisation to Development. A Plan for the Period Mid-1968 to Mid-1970. July 1968. p. 86.

9. University of Science & Technology, Kumasi: Report of the Committee on the Role (Past present and Future) of the University of Science & Technology, Kumasi in the development of the Country. 1970 (mimeo.)

A close examination of the endeavour made in Ghana over the past ten years or so to develop the managerial & technological capabilities discloses some obvious short-comings which can be put into two broad categories

(1) deficiencies in the structure or content of education at different levels to meet the needs of management studies and

(2) lack of co-ordination among the institutions that have been established to undertake management education and training.

Deficiencies in the Structure of Education Viewed in Terms of Management Needs

The development of industry in a hitherto predominantly agricultural country poses problems which are different from those which confronted the Western European countries on the eve of their industrial revolution. Many less developed countries of today in their attempts to industrialise rapidly are trying to make what one observer has called a "revolutionary jump into the twentieth century." These "late starters" want to short circuit the several centuries of preparation in production techniques and slow organic adjustment in social and economic organisation which the early "industrialisers" had. What has to be realised is that the industrial revolution which took place in Europe was the outcome of their cultural heritage. As one writer has said developing nations cannot "simply import the industrial revolution from abroad, uncrate it like a peice of machinery and set it in motion".[10] What this boils down to is that effective use of technology requires something more than borrowing.

In order to acquire the type of technology and forms of industrial organization that will suit our culture, it is imperative that people who are likely to carry the responsibility for production - the educated professional technologist/manager in particular - must be given a basic understanding of the means and techniques of production. It should be the objective of the technological universities and institutions to instill this basic understanding of the technology of production - technical and managerial - in the graduates they produce.

10. W.W. Lockwood: The Economic Development of Japan. Princeton University press 1968, p. 499

This should be the pre-requisite of industrial management training in a less developed country that is currently predominantly agricultural.

Lack of coordination among institutions

The second shortcoming of the prevailing arrangement for high-and middle-level management education and training in Ghana is that there is a glaring lack of coordination among the various institutions. Even more important is the absence of a single overall body responsible for mobilising and aligning the activities of the various institutions to the needs of the manufacturing sector just as is done at the lower level by the National Vocational Training Institute for the craftsmen and skilled workers.

The development of managerial and technological capabilities in a developing country can properly be undertaken by different institutions, but there should be an awareness throughout the system of what each institution is doing and there should in consequence be a harmonisation of functions. Since the manufacturing sector requires the development of managerial capabilities in a technological enviornment, GIMPA, which by the Decree that broadened its activities is given the mandate "to co-ordinate and direct management training programmes in the country" and CSIR which also by its relevant Decree is assigned the responsibility "to encourage scientific and industrial research of importance to the development in the national interest of industry, technology, agriculture and medicine" must of necessity liaise closely on matters relating to technology and management for industry. But do they?

So much for the shortcomings. We now turn to major factors which have militated against the development of managerial and technological skills in the country within the last ten years. Firstly there is the problem of inadequate physical facilities in the three universities. This problem is so acute that students are paired in rooms (in halls of residence) that are meant for only single students. Classroom space is also limited and staff bunglows are also in short supply.

Secondly, lecturers are too few with the result that they are saddled with heavy teaching load. This discourages research by lecturers. There are quite a number of qualified Ghanaian scholars who could apply for appointment as lecturers/professors but have not done so because of relatively low remuneration for lecturers/professors in Ghana. This also retards the rate at which skilled manpower is produced and technology is multiplied.

Thirdly and finally insufficient funds (domestic and foreign) have to a very large extent been responsible for shortage of academic and residential accommodation, shortage of textbooks and the teaching equipment and inadequate research studies in the universities, management institutes and research institutions in the country. Shortage of foreign exchange with which to buy some inputs from abroad has also contributed to the slow rate at which most building contracts for the universities are excuted.

III. THE RECOMMENDED PROGRAMME

(a) General Principles & Approach

It is apparent from what has been said in the foregoing chapter that a successful evolution of Ghana's industrial programme will if necessity demand that investment funds be properly expended on capital goods that are appropriate to the needs and conditions of the country and that highly trained managers and top-level technical specialists in adequate numbers be made available to man them. Plants and machinery by themselves are not enough; they require efficient operators to turn them into viable productive units. The British experience shows the extent to which an industrial country's growth rate can be considerably slackened by its inability to make full use of its existing technological capabilities because of lack of adequate attention having been paid in the past to producing managers of the calibre fit to utilise to the greatest advantage the country's prevailing technological capabilities. Britain, the first nation to experience an industrial revolution, is yet to have a managerial revolution. So far in practically all the industrialised countries, the managerial revolution has been follow-up of the industrial revolution, though the time span between the two has varied from country to country.

If ever a telescopic development were to be recommended to the LDCs for adoption, it would certainly be that relating to these two types of revolution. However in Ghana the industrial problems engendered by the shortage of high-level management manpower at the early stages of the country's bid to industrialise have been quick in making these two developments almost concurrent issues.

(b) Considerations for the Development of such a Programme

As far as the future is concerned, the agenda for action to correct any imbalances in Ghana's industrial structure and industrialisation programmes will have to be prescribed by the existing and emergent problems that require speedy rectification as well as by the objectives that are outlined in the Guidelines for the Five-Year Development Plan, 1975-1980 and subsumed under the over-riding aim: to expand the economy at an average growth rate of 5.5% per annum over the plan period and in so doing create an independent national economy that takes the principle of Self-Reliance as its guiding philosophy.

Other assumptions made for the Plan are that the country's population will continue to grow at the rate of 2.7 per cent per annum; that Government consumption expenditure will grow in real terms at about four per cent per annum and that the earnings of foreign exchange through exports will grow over the plan period at the rate of two per cent per annum which is taken as the rate at which per capita consumption must grow. These objectives are meant to reverse the hardly satisfactory performance of the economy over the decade of the 1960s when the GDP grew at an average rate of 2.5 per cent, whilst the growth rate of population was reckoned to be 2.7 per cent per annum.

During the latter part of the 1060's the manufacturing industry emerged as the engine of the nation's economic growth. Reference to aspects of its performance has already been made above and more information on it is provided in Table 3. But the sector has been encountering some problems of which the principal ones according to the Guidelines for the Five-Year Development Plan are:

> "high production costs, low capacity utilization, limited scope for forward and backward linkages, low domestic value-added, limited employment creation capacity, unbalanced geographical distribution, poor management and poor forward planning, neglect of the small-scale sector and poor maintenance and repair facilities".[11]

Many of these problems are interrelated and some are the direct outcome of poor management and bad planning which are mentioned. An attempt to find solutions to these two will therefore help to eliminate some of the others. There is however one issue which for the Recommended Programme has to be singled out for treatment and that is the small-scale sector, which so far has been relatively neglected in the nation's industrial promotion exercises.

Small-scale industries are admitted as having an important part to play in the industrialisation of the less developed countries, at least in the early stages. If the LDCs are not to depend solely on the transnational firms for both the funds for industrial investment and the technological and managerial know-how for their industrialisation programme and as a consequence encounter years of difficulties in not being able to repatriate profits accruing from such ventures, then the establishment of indigenous industries should constitute an essential ingredient in national development programmes.

Because the indigenous manufacturing enterprises are small scale at the outset, they usually find it difficult to obtain assistance, financial and otherwise, from normal sources. For this reason they deserve the special attention of Government. The assistance to be given them, beside that of finance, can take the following forms:

(i) the establishment of a management centre or centres from where advice can be given to clients and seminars on administration, production management, marketing, accounting etc.

---

11. Ghana Government: Guidelines for the Five-Year Development Plan, 1975-80, Accra, January, 1975 p. 17.

held from time to time. Periodic visits to enterprises constitute an essential part of the centre's schedule.

(ii) The creation of technology consultancy and advisory centre(s) the purpose of which is not only to give advice to clients who call but also to make occasional visits to manufacturing units in order to ascertain their problems and to work out appropriate solutions.

Where necessary or advisable the establishment of industrial estates for the use of indigenous, small-scale, privately-owned enterprises will go a long way in causing the entrepreneurial spirit of some people to easily burst open.

TABLE 3

GHANA: CONTRIBUTION TO GROSS DOMESTIC PRODUCT BY THE LARGE-SCALE AND MEDIUM-AND SMALL-SCALE MANUFACTURING SECTORS (AT 1968 MARKET PRICES)

	1968		1969		1970		1971	
	(¢m)	%	(¢m)	%	(¢m)	%	(¢m)	%
Large-scale manufacturing	156.3	9.2	190.4	10.6	206.6	10.7	229.0	11.0
Medium- and small-scale manufacturing	57.6	3.4	59.1	3.3	58.2	3.0	60.3	2.9
	1,700.2	100.0	1,802.4	100.0	1,928.7	100.0	2,081.9	100.0

Source: Central Bureau of Statistics, Accra, Economic Survey 1969-1971.(1976).

As shown in Table 3 the percentage contribution of the medium and small scale manufacturing units to the GDP of the country calculated in constant price has steadily been declining. From 3.4 per cent in 1968 it fell to 3.3 per cent the following year. For 1970 and 1971 the contributions were 3.0 per cent and 2.9 per cent respectively.

In absolute terms the contribution of the sector has not shown a steady increase. The 1968 output of ¢57.6 million rose to ¢59.1 million in 1969, then fell to ¢58.2 million in 1970 before rising to ¢60.3 million in 1971. The performance during the period in Table 3 can be described as annual fluctuation around a slightly rising trend line.

In contrast to the performance of the medium and small-scale manufacturing units the large scale manufacturing sector has been expanding at a steady as well as a rapid rate. Estimated in 1968 market prices its contribution increased from ¢156.3 million in 1968 to ¢229.9 million in 1971. This credits the large-scale with an annual increase of over ¢24.0 million in contrast to the medium and small-scale sector's annual expansion of about ¢1.0 million.

The poor performance of the small-scale manufacturing sector is recognised by Government and is attributed to neglect by the Guidelines for Five-Year Plan. It is proposed below that a Committee or sub-committee be set up to concern itself with the affairs of the sector.

With regard to management training all that is said in the Guidelines is that management education will be streamlined and centred in certain institutions". This statement of intent does not go far enough. What is required is a new machinery for effectuating co-ordinated programmes with regard to the training of both managers and technologists at all levels and under all schemes; formal full-time education, on-the-job training or short-run course.

In order to perform its functions effectively, this machinery, which should take the form of a central council under the umbrella of the Ministry of Economic Planning, should concern itself not only with the development of managerial and technological capabilities in Ghana but with related issues as well.

Ghana has now reached a stage in her development where she has to be very clear about what industrial goods are to be produced, in what quantities they are to be produced and what technology is to be used to produce them. In order words some planning is required to identify priority industries and map out a course of action to achieve an integrated but gradually evolving industrial development.

In carrying out this exercise lessons can be learnt from the experience of other nations, especially the "late starters". Among the crucial issues to be given careful consideration are: the choice of technology and its effect on employment opportunities and unit cost of output; location of industries and plant capacity utilisation; home-produced vrs. imported raw materials; the causes of low domestic value added; import-substituting industries.

1. The Central Council

The justification for this body has been explained above, it is primarily to co-ordinate the activities of the several institutions and organisations that have been set up in the country since the country's attainment of political independence either to conduct research in the field of technology or to provide training for managers and technical specialists. By so doing it is hoped that maximum benefit will be derived from their concerted endeavours.

2. Research and Technical Services Centre, Accra

The centre, which is a joint venture between the government of Ghana and Ghana Manufacturers Association, was inaugurated in August 1976. Its main objective is to provide small-scale manufacturers with certain basic skills and services required for their industries which otherwise cannot be obtained. The Centre is to provide information on alternative sources of technology, transfer and adaptation of technology, appropriate technologies for different jobs and costs (direct and indirect). It is also expected to assist manufacturers to identify their problems and help them to solve them. Besides it is expected to offer assistance to manufacturers in preliminary project studies, market surveys, sources of raw materials and machinery, export opportunities, etc. And in the prosecution of its functions, the Centre is to "make the maximum use of the facilities (government) has already provided in the country's research institutes under the CSIR, Universities, NDPI, GIMPA, CEDC, etc".[12] Its constant call on the services of these institutions will put them of the alert and show them very clearly areas in which they themselves are deficient in personnel and equipment. The activities of the centre are therefore related to the current development plan of the country.

---

12. Speech delivered by Dr. R. Gardiner at the inauguration of the Management Board of the Research and Technical Services Centre of the GMA, August, 1976.

(c) Selection of National Institutions and Organisation to Participate in the Programme

The Central Council mentioned above should be under the chairmanship of the Commissioner (Minister) for Economic Planning, with representatives of the following servicing on it:

(i) Ministry of Economic Planning
(ii) Council for Higher Education
(iii) Council for Scientific and Industrial Research
(iv) Ghana Institute of Management and Public Administration
(v) The three sister universities - University of Ghana, Legon, University of Science and Technology, Kumasi, and the University of Cape Coast.
(vii) Ghana Industrial Holding Corporation:
(viii) National Vocational Training Institute
(ix) Research and Technical Services Centre, Accra
(x) Technology Consultancy Centre, Kumasi,
(xi) Ghana Manufacturers Association
(xii) Ghana Institute of Management

The General Council can have under it two committees to be formed from the members of the General Council and with responsibilities for training and research matters relating to both management and technology.

Many of the institutions and organisations mentioned above were referred to in Chapter 2; these qualify for inclusion in the programme on account of their previous involvement and contribution. There are one or two new ones and they are listed below together with reasons for their inclusion.

1. Ghana Industrial Holding Corporation (GIHOC)

This corporation has an important role to play in the programme for the development of managerial and technological capabilities. Its manufacturing units which are either fully or partly owned by the State are being run by people-both high-level general and technical managers - with expertise in industrial manufacturing.

Since top-level managers are scarce in Ghana, and manufacturing establishments in the private sector are not known to open their doors easily to outsiders, the enterprises of GIHOC may be where student managers and technologists can best acquire practical training.

2. Ghana Manufacturers Association (GMA)

This Association comprises the employers of industrial managers and technologists. As the users of the end products of the technical and business institutions they are in the best position to evaluate both the products and the system that produces them. The Association can also have much to say about such things as employment, the technology most appropriate for use, industrial development priorities, etc.

3. Ghana Institute of Management (GIM)

This recently formed organisation (1976) can make a valuable contribution to the development of managerial capabilities. They can institute professional examinations at different levels for practising managers, thereby giving proof to the idea that management development is a continuous process.

A Note on Industrial Management Training at the University of Science and Technology

It is envisaged that under the Recommended Programme management education at the University of Science and Technology will be strengthened; that management courses designed to suit the needs of technical students would be integrated into the undergraduate programmes of almost all science and technological courses being run in the university. This is management education at the grass-roots.

The students should be made cost conscious from the early years of their training; they should be made to realise that the industrial world's decision to produce embraces technical as well as economic considerations and that recognition of both is vital for the survival of a firm in a competitive world.

The post-graduate course in industrial management that has been started should be provided with adequate funds, equipment and staff so as to enable easy future expansion. To facilitate and enrich the programmes for higher work, there should be established management centre which can provide services to the business community and from which personnel can be obtained to do part-time teaching in the Department of Economics and Industrial Management.

As the institution currently producing the majority of the country's highly trained technologists, the University of Science and Technology has a crucial role to play in the recommended concerted scheme to develop Ghanas managerial and technological capabilities, and should thus be assigned the responsibility in view of its structural set up and facilities.

d) Financing the Programme

i) Local

The following Ghanaian institutions are to finance the programme: Ministry of Finance, Bank of Ghana, Commercial Banks, Ghana Cocoa Marketing Board, State Insurance Corporation and individual members of GMA.

ii) Foreign aid

Foreign aid and technical assistance will be expected from UNIDO, ODM, African Development Bank, Arab Group of Three and friendly countries such as Britain, Canada, USA, USSR, Western Germany, China and Japan.

e) Method of financing

The Ministry of Finance will finance the programme out of its annual budgets while the Bank of Ghana will support research studies connected with the programme. The Bank of Ghana, like the Ghana Cocoa Marketing Board, will also participate in some of the industries under the programme. The Commercial Banks are expected to grant loans to finance both old and new industries provided they have been identified as technically and commercially viable. The role of the SIC is that of participation in some of the industries and individual members of GMA are to support the training of special skills which they need.

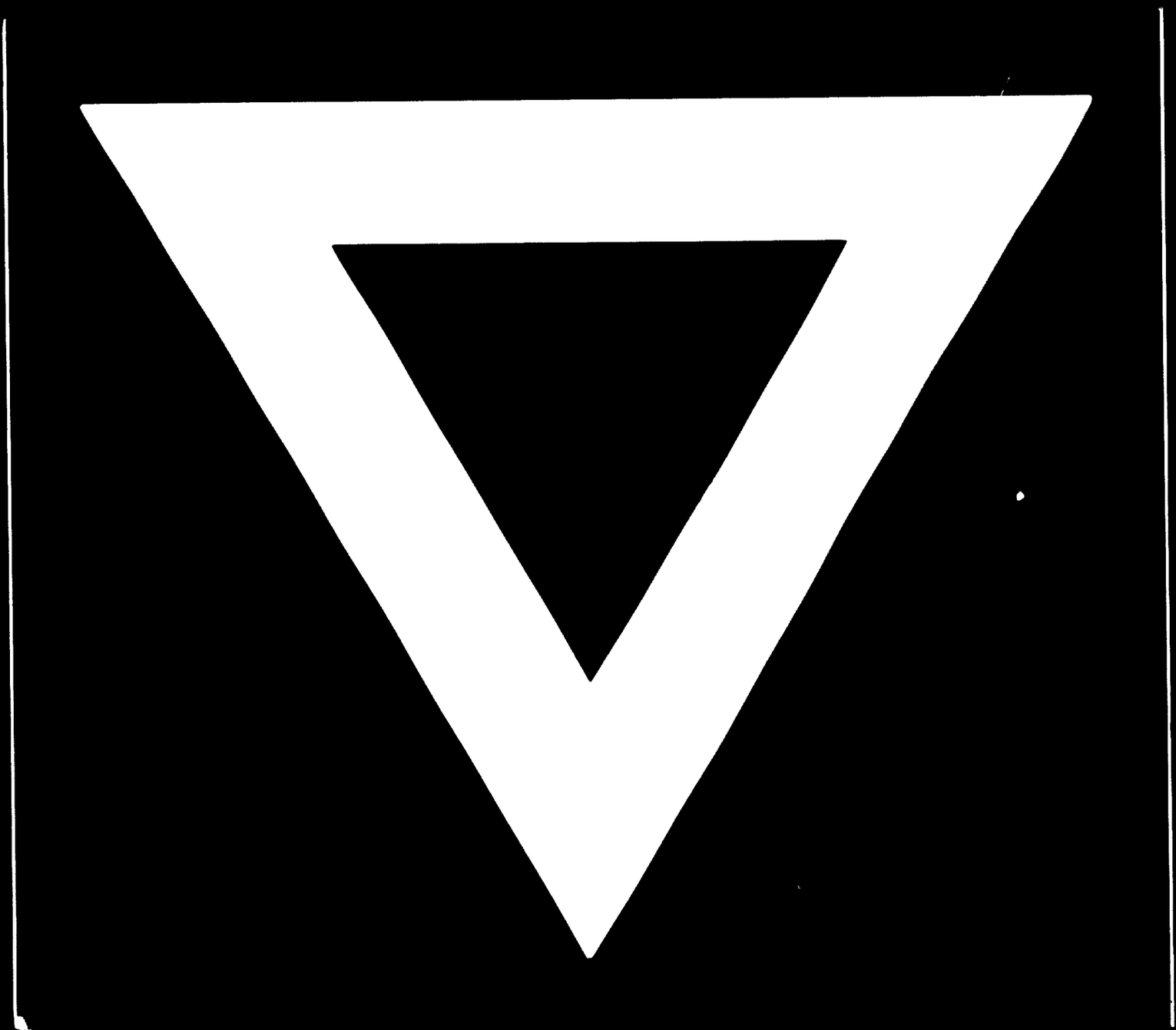
The foreign sources of funds are expected to finance the foreign component of the programme by providing foreign inputs such as raw materials, machinery, spare parts and skilled and experienced personnel. And we hasten to suggest that the external sources of finance be asked to give soft loans with at least five years moratorium on the repayment of principal and interest since the establishment of the programme and the training of skilled manpower required by the industries will take about four years even though industrial production and exports can be increased during the very first year of the programme.

f) **Evaluation**

The programme is a well tought-out one designed to quicken the pace of industrial production in Ghana by focusing attention on input requirements of industries in Ghana and mapping out a strategy to provide the needed inputs. These input requirements include managerial and technological skills as well as raw materials, machinery and spare parts. And the strategy is one in which a Central Council in consultation with a number of organizations both in Ghana and abroad plans, executes, directs and controls the activities of a number of institutions and industries in the country with a view to increasing industrial production. And if the programme is properly implemented, it will be highly successful and reduce Ghana's heavy dependence on only one crop, cocoa.

It must be noted, however, that the success of the programme depends on the availability of funds and data, provision of more educators, expansion of academic and residential accommodation in the three universities and the extent to which the programme stimulates production in other sectors of the economy particularly agriculture.

C-672



78.11.09