INTERNATIONAL DEVELOPMENT AND COMMUNICATION:
A CASE STUDY OF THE ORIGINS, OBJECTIVES AND CONSEQUENCES
OF GHANA'S VOLTA RIVER PROJECT

by

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ABSTRACT

The greater emphasis laid on economic and political analysis of international development aid has consequently obscured its study as a form of communication. The purpose of this thesis is to show the communication role of development aid in the international system and its impact on Ghanaian society through a case study of the huge multi-purpose Volta River Project (VRP).

Two groups of methods were used: (a) comparison of opinions, editorial comment, government publication, public speeches, and evaluative reports about the VRP, and (b) analysis of these ideas in relation to the origins, implementation and consequences of the project in the context of assumptions about communication and the "modernization" of traditional societies. The author is very familiar with this region of Ghana and with the historical process since the VRP's completion.

Development projects like the VRP constitute an important communication of knowledge and experience on the part of one nation with another, but the success of a particular project depends on the extent to which the project can be converted to widespread benefits in the great mass of Ghanaian society. This thesis examines the range of intended and unintended consequences which can be attributed to the VRP. Because of the profound differences in culture and economy, nations and peoples differ
widely in their perception and judgement of the "benefits" of development projects. National governments and international development agencies articulate and communicate their interests through these projects (for example, industrial expansion, resource extraction, regional stability and influence). Evaluation of the VRP shows that unless accompanied by effective communication and structural adjustments, projects do not naturally lead to the desirable progress which was envisioned by planners committed to the idea of "modernization" in the 1950's. The ideal of sharing the West's knowledge, technology and experience expressed in the VRP plans contrast sharply with the historical evidence that the project primarily benefitted the already developed regions of Ghana, and reinforced the advantages of the educated urbanized elites who capitalized on this opportunity. Though the VRP created a major public utility (electric power) critical to Ghana's industrial and social development, the project did not confer upon Ghana the economic and political stability intended by its planners as witnessed by history of coups since the overthrow of Nkrumah in 1966. But if such projects are to benefit the poor and underprivileged for whom they are ultimately intended, their interests must be incorporated and regularly expressed in project planning and implementation. This incorporation and expression is one of the communication responsibilities of specific projects.
To my wife and helper, Dora
ACKNOWLEDGMENTS

I want to extend my appreciation to (i) the members of my committee, especially my senior supervisor, Professor R.S. Anderson, whose understanding and valuable criticisms have stimulated my thoughts and sustained my effort and hence enabled me to produce this work; (ii) Mr. Colombus Boakye-Ansah, who made it possible for me to obtain the information I required from Ghana for the writing of this thesis; (iii) Aluminium Limited of Canada (Alcan), which, in addition to answering my questionnaire regarding their involvement in the Volta River Project in the 1950's, furnished me with useful material on the Project; and finally (iv) Mr. Eric Osei Yaw, who partly supported financially my studies in Canada.
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1925 - Publication of official bulletin drawing attention to hydro-electric and aluminium production potential of Volta River by the Gold Coast colonial administration (based on A.E. Kitson's report of 1924).

1938-39 - Early business interest in the Volta Scheme initiated by E. Duncan Rose, a South African private geologist. He re-examined Kitson's proposals with the view to developing an integrated aluminium production in the Gold Coast.

1944 - Formation of West African Aluminium Company (Wafal) by Duncan Rose.

1948 - Disturbances in the British Colony of the Gold Coast; Watson Commission appointed by the British Government to investigate causes of the disturbances; VRP was highly recommended by the Commission in its report.


- Aluminium Limited of Canada (Alcan) and British Aluminium Company (BACO), both of which already had bauxite concessions in the Gold Coast, acquired interests in Wafal.
- Sir William Halcrow and Partners engaged by the Governments of the Gold Coast (G.C.) and United Kingdom (U.K.) to investigate the Volta Scheme.
- Joint Mission (Anglo-Canadian Aluminium Companies of Alcan and BACO) made its private investigation into VRP.

1950
- Fuel crisis in the G.C. in respect of imported coal for the national railways.
- The private Joint Mission published their report on the VRP.

1951
- Kwame Nkrumah invited to form Convention People's Party (CPP) Government in the G.C. The election manifesto of the CPP promised realization of Volta River Project; the United Gold Coast Convention (UGCC), which became the official Opposition Party, also emphasized the implementation of the VRP as a priority of its manifesto.

1951-52 - Exploratory talks on the VRP in London and Accra by the Governments of G.C. and U.K. and aluminium companies (Alcan and BACO).

1952
- British Government issued a White Paper on the basis of the Report by Halcrow and Partners regarding the VRP. The White Paper recommended the establishment of Preparatory Commission to investigate the Project
again and to frame the constitutional powers of Volta River Authority (VRA) and official Agreement of the VRP venture.

- Arthur W. Lewis came to the G.C. to survey and write official report on Gold Coast's industrialization.

1953

- Preparatory Commission for the VRP (PCVRP) set up, headed by Sir Robert Jackson to investigate the Project and make recommendations for its implementation.
- National Committee on the VRP established to protect the G.C. people's interest and to advise G.C. Government on the VRP matters.
- The G.C. Legislative Assembly approved the establishment of a Preparatory Commission for the VRP.

1954

- General Election in the G.C.; VRP mentioned again by the CPP; CPP won the election and stayed in power.
- A survey undertaken on Trade and Investment Opportunities in the Gold Coast by the United States' Point Four Technical Assistance Program.

1955

- A government-appointed Committee rejected federalism as being too costly in proportion to its advantages and too difficult - for want of qualified Africans - to implement, but proposed regional consultative
councils as a substitute.

- Publication of the Report on Trade and Investment Opportunities in the Gold Coast by the U.S. Government.

1956

- PCVRP published its report on the VRP.
- Talks on the Report by all the parties involved in the VRP (G.C. and U.K. Governments and the aluminium companies of Alcan and BACO) in London.
- Statements issued by the two governments and Alcan on the VRP regarding the Project's future; the statements emphasized the need for revising the 1951 terms of partnerships.
- Political situation in the G.C. became tense and relatively unstable as the Ashantis pressed their demand for federalist constitution before independence.
- The British Government asked Nkrumah to call a general election before considering his Government's request for independence. The general election was called and CPP won majority in the election to lead the country to independence.
- World Bank's survey of the economy of the G.C. with special reference to the VRP prior to considering independent G.C.'s application for membership in the Bank.

1957

- G.C. granted independence under new name of GHANA.

1958
- Nkrumah visited U.S. and Canada. In the U.S. he raised the VRP's financing problem with President Dwight D. Eisenhower. Following Nkrumah's U.S. visit, U.S. and Ghana Governments retained Kaiser Engineers and Constructors to reassess the VRP economically and financially with the view to reducing its costs.
- Alcan withdrew from the VRP venture.

1959
- Kaiser's reassessment report on the VRP released.
- Kaiser invited by the two governments to form a consortium that would partake in the VRP venture.
- Volta Aluminium Company (VALCO) (Ghana Limited) was formed.
- Ghana's Government and VALCO signed tentative agreement to implement the revised VRP as business and public utility.

1960
- Upon request by the Government of Ghana, the World Bank reappraised Kaiser's reassessment report on the VRP.
- Ghana became a Republican State within Commonwealth of Nations.
- While in the U.S. attending UN General Assembly, Nkrumah had the occasion to call on newly-elected
President Kennedy in Washington. The VRP topic was raised.

1961
- Ghana received firm assurance from the U.S., Britain and the World Bank for loans for the implementation of the VRP.
- Establishment of the Volta River Authority by Ghana Parliament to construct and operate the VRP.
- (July-August) Nkrumah made extensive tour to Eastern European countries and China, making statements sympathetic to socialist systems and ideals.
- Political repression in Ghana amidst strikes and threats to strike by workers in different quarters.
- U.S. Government became reluctant to invest in VRP because American public opinion had become hostile to the Nkrumah regime.
- (September-October) U.S. Government sent Study Mission to Africa with special reference to Ghana.

1962
- U.S. announced finally to participate in the VRP.
- "Master Agreement" of the VRP signed.
- Formal start of work on the Project commenced.

1966
- Official opening of Akosombo Hydroelectricity.
- (February) Nkrumah was overthrown by the Ghana Armed Forces and police in a military coup d'etat.
CHAPTER I

INTRODUCTION

The Purpose of this Study

The purpose of this study is to examine Ghana's Volta River Project (VRP) as an instrument of economic development and social change in the context of international development and communication. In addition to contributing to the study of development and communication, this analysis will shed some light on social, economic and political significance of the VRP in national and international development.

I chose to analyze the VRP for two reasons: first, because of its economic and political significance from national and international points of view; and second, because its being a single project made it possible to examine differences of objectives, motivation and practice, beliefs, values and perceptions of the parties involved in the origins and implementation of this project and to explain relations among these factors as well as the extent to which they influenced the actions of the parties toward the implementation of the project.

The Importance of this Study

This study is important because the results of its analysis
of the merits and limitations of the kind of approach to economic development exhibited by the VRP will be relevant to decisions regarding future regional development.

The analysis of the VRP has the advantage of revealing the strength and weakness of the so-called multipurpose single big projects as a mechanism of economic growth and social change in the low-income countries. This can be compared with the single purpose projects like the Groundnut scheme in colonial Tanzania in the late 1940's by the United Kingdom.¹

First it shows that neither economic development nor modernization can exclusively bring about growth and change. Economic factors alone cannot give an impetus to, and sustain, desirable social change. Enlightened political action, which implies an effective communication system to help create common values, beliefs and attitudes towards development objectives and problems, is also necessary. This study has demonstrated that the great emphasis often placed on economic factors of growth and change in less developed countries leaves much to be desired. Aside from simply "putting the cart before the horse", such an approach does not adequately come to grips with problems of development in those countries. A more realistic approach lies in the creation of a meaningful balance between economic and non-economic factors. Through a timely planned and executed action based on interdisciplinary research into the issues, the desired objectives could be achieved. As communication is fundamental to all forms of human intercourse, it is only appropriate to accord it a legitimate role in the study and planning of
development projects.

On the other hand, the project analysis also raises social, economic and political questions for the government and the people of Ghana about cost-effectiveness of big projects for national development. Nkrumah and his government considered the VRP as the key to Ghana's economic prosperity. They also saw international development as the best way of creating new sources of knowledge, skill, and experience as well as wealth, including expanding economy and purchasing power to help raise the standard of living of Ghanaians and maintain political stability. But in the light of the VRP, the economic and political rationale behind the continuous flow of capital investment and technical aid, requires re-examination.

Second, the multipurpose projects like the VRP in Ghana, the Aswan High Dam of Egypt and the Mekong Project in the South-East Asia, were all seen as an instrument of regional economic development based on the use of "applied science and technology." Like the Volta Project, the Mekong Project was big, multipurpose and involved heavy capital investment. It was multilaterally arranged and financed by several countries and international organizations and the World Bank since its early planning from 1952 to 1957. Moreover, the Mekong and Volta Projects were both an example of "Development Regionalism," except that the Mekong Project involved several countries (Laos, Cambodia, Thailand and Vietnam, usually referred to as "Riparian States") with complex social and cultural backgrounds and
diverse political experiences in that they have had a long and complicated military interaction from within and without. Finally, they all emphasized local participation and self-help in development and planning. As Franklin P. Huddle has noted in the case of the Mekong Project, it was assumed that "development of a country is inherently a process of technological application toward an economic result." This implied physical transformation of an under-developed economy as a prerequisite for the industrialization of that economy. The VRP was highly recommended by a renowned and professional economist, Arthur Lewis, Ghana's economic advisor in the 1950's and VRP consultant.

Another reason for this study is that since the VRP's completion in January 1966, studies done on the project have been limited to specific aspects and effects of the project. No comprehensive and integrated study of the VRP as a single and regional development programme has been undertaken. Therefore, this study will fill this gap.

The Background of the VRP

Ghana, under Nkrumah and his Convention People's Party (CPP) conceived the VRP in the context of Ghana's industrialization and accelerated economic development. The government was influenced to employ this project as an important aspect of its economic policy by the concept of development held by mainstream economists like Arthur Lewis, who saw development as a relatively
self-contained economic process which required the injection of capital and technical skills into a "dormant" economy. Development was largely associated with modernization and, hence, structural transformation. Little attention was given to the existing socio-economic structure of the so-called dormant society.

Economists like Lewis and Ragnar Nurkse defined development in the 1950's in terms of "poverty" and "growth" measured by per capita income. Indeed, the per capita income and the state of technological development became the main criteria for judging the level of a country's development.

Nurkse saw poverty as being a "vicious circle" - a constellation of factors which militate one against another and hence make "growth" a remote possibility. In his view, both the inducement to invest and ability to save were a function of per capita income or demand.

Lewis saw development as a process of balanced growth in which agriculture and industry must be complementary. In his view, as long as agricultural income was fixed and as long as agricultural productivity was low, there could be no balanced economy. Agriculture was a provider of food, raw material and market for industry, so unless agriculture grew, industry could not sustain itself. But agriculture could not grow (generate high yields and increase its productivity annually) without modernization, in his view.

In 1953, when he wrote his "Report on Industrialization and
the Gold Coast," based on his "Balanced Growth" theory, Lewis therefore considered agriculture as a number one priority. He said that:

The most certain way to promote industrialization in the Gold Coast is to lay the foundation it requires by taking rigorous measures to raise food production per person engaged in agriculture. This is the surest way of producing that large and ever increasing demand for manufactures without which there can be little industrialization. And he also stated:

If the best way to promote industrialization is to have an agriculture policy which raises output and income per head then the next best way is to have an adequate framework of public services. The infrastructure would be in the form of public services such as energy, water, public health, and so on.

Lewis also saw that a developing country must do two further things to attain economic growth: it must grow its own entrepreneurial and administrative class; and it must generate its own domestic finance (through taxes and saving) in order to maintain adequate public services and a high level of capital formation without external dependence.

In the light of this background, the Volta Project was considered as a sound economic base for industrialization. Lewis recommended the project to the people of the Gold Coast, saying:

My reason is simply that I think it will pay the country handsomely in the material sense...This project will also help other kinds of development. The roads, railways and harbour works will stimulate all sorts of other activities. The new lake will add to the fisheries potentials, and will also facilitate irrigation. The dam will provide additional electric power for the rest of the
The Assumptions of Economic Development Theory and the Role of Communication in Development

The 1950's witnessed a fashionable use of big projects as a means of generating economic development and social change in the Third World. Economists like Arthur W. Lewis, Ragnar Nurkse and A.O. Hirschman, concerned about problems of economic growth in less developed countries, believed a major investment effort (big push) towards infrastructural and resources development was a solution to the "vicious circle" of economic poverty in those countries. The Volta River Project (VRP), like other multipurpose regional development projects in the Third World, was conceived in this context. Similarly, in this period communication theorists, like Daniel Lerner, Wilbur Schramm and E.M. Rogers, in their studies of modernization and social change in the communication context saw "modernization" as both an instrument and index of change in less developed countries.

Rogers has summarized the western concept of modernization and communication under what he calls an "old" paradigm in the 1950's and 1960's in the following way. Under the old paradigm, planners believed that economic growth was achieved through industrialization accompanied by urbanization. They assumed that development performance could be quantified in economic terms: GNP and per capita income. Capital-intensive and labour-
extensive technology, mainly imported from more developed nations, were regarded as ideal for economic development in the less developed countries. In order to guide and speed up the process of development, economists considered centralized planning desirable. The approach to development was top-down, which meant that development programmes were initiated, centrally planned, and executed by the government and for the people who were expected to take advantage of whatever benefits they provided them with, less attention to whatever forms of inequality (such as economic, social, political, geographical and so on) already existing in a given society. Finally, planners also believed that the causes of under-development lay mainly within developing nations, rather than in their relationships with other countries.11

And so, under the old paradigm, communication theorists like Lerner, Rogers and Schramm, who were all concerned about the role played by communication in development, advanced theories about the role of communication in which modernization, in their view, promoted the western development model. Lerner saw "modernization" as an evolutionary process which occurs in four phases: urbanization, literacy, media participation and political participation. Moreover, the process of modernization assumes the following pattern: increasing industrialization promotes urbanization, rising urbanization tends to promote literacy, rising literacy tends to increase media exposure, increasing media exposure tends to increase popular participation in economic and
political life. To Lerner, therefore, industrialization, urbanization, literacy and political and economic participation are all in certain order of sequence in which each of these follows the other.

The sequence of industrialization also evolves from physical through social to psychic mobility. He has suggested that psychic mobility (empathy), which implies "the capacity to identify oneself with the new and strange," is a prerequisite of modernization. Psychic mobility is an indispensable mechanism of modern ways because it "equips individuals to operate efficiently in a rapidly changing society which requires both mobility and participation."

In the context of international development, Lerner saw the western model as the basis of international development cooperation, which he has defined as:

International communication in which the economically advanced countries present to the others "a picture of what they may become," and the developing countries decide what aspects of the picture fit their self-image, what components they wish to transform, and how to do it.

According to Lerner, therefore, "the process of international development cooperation is essentially a communication process." And that, in the view of Lerner, the significance of the western model is "its generality as a development model not its particularity for the geographical region called 'the West'," because, in his view, "the western societies still provide the most developed model of societal attributes such as power, wealth,
skill, mobility and rationality."\textsuperscript{18}

To Rogers, "modernization" was "the process by which individuals move from a traditional way of life to a more complex, technologically-advanced, rapidly-changing style of life."\textsuperscript{19} Thus, as he has suggested, if the less-developed nations are to move towards higher levels of income and living standard, the majority of the population must change its life style.\textsuperscript{20} And all change, according to Rogers, inherently rests on the spread of new ideas which may be technological innovations in agriculture, or they may be new ideas in health, or family planning, or they may be political news or new manufacture techniques, and so forth. According to this view, therefore, whatever the concern, human behaviour is changed by communicating new ideas.\textsuperscript{21}

Similarly, according to Schramm, "communication is at the very centre of existence for any society, developing or not."\textsuperscript{22} He has, therefore, suggested that if the flow of information and the channels of communication are not adequate to the tasks assigned to the communication media, they must be built up to the level of need.\textsuperscript{23} Schramm states that economic development leads to an increase in the flow of information through the greater purchasing capacity of people reflected in subscription to newspapers, magazines and specialized journals, ownership of radios and so on. But he has also stressed that increased information furthers economic development. Accordingly, under the old paradigm, the role of communication in the process of development has been described in different ways by Schramm, Lerner and Rogers.
In his book, *Mass Media and National Development* (1964), Schramm suggested that "one aspect of communication in development is of special concern to the new and emerging countries - this is the contribution that effective communication can make to economic and social development." Free and adequate information, according to Schramm, is not only a goal, but also a means of bringing about desired social change. "Without adequate and effective communication," therefore, Schramm has pointed out, "economic and social development will be inevitably retarded and may be counter-productive." Based on his suggestion that "within every economic problem lie human and social problems," Schramm has stated that if national economic development is to occur, there must be a social transformation and, in order for this to happen, human problems must be solved. He has summarized the various roles of mass communication in national development under the heading of watchman (or surveyor of the environment), policy maker (by producing channels for communication among and between the leaders and citizenry), and teacher of new skills and knowledge.

Since the 1970's, many communication scholars have advanced new theories towards new relations between development and communication in the Third World. One of these recent theories is Parker's "Information-Based Hypothesis." Although yet to be empirically tested (as Parker himself has pointed out) this hypothesis implies an information-intensive development strategy and is being seriously considered in the United States of America's Agency for International Development (U.S. AID) as
an alternative to the traditional capital-intensive development strategy.29

According to Parker, effective transfer of knowledge from developed to less-developed countries is likely to bring about rapid development in the less-developed world and equitable global distribution of wealth in the world system. He argues that continuous application of current and new ideas to limited resources permits unlimited future growth. Parker's information-based hypothesis is based on the premise that the level of social organization and the level of initial education of development workers (at the local level) can be improved by making available additional information and social support through telecommunications in the rural Third World. He emphasized the use of communication satellites to provide information and management coordination for local workers and relatively untrained development agents.

In his critique of the information-based development strategy, McAnany (1978) asserts that "the role that information might play in this task of helping rural people to lead more productive, healthy lives depends on political decisions about the struggle to eliminate structural blocks to growth and on how to use their information resources in the most appropriate way in that struggle."30 McAnany, by implication, does not reject the information-based development strategy. Nevertheless, he questions some assumptions of this model in terms of equity, cost and feasibility, and suggests specific measures to achieve specific goals.
McAnany identifies two political and technical constraints that act as internal and external barriers to the flow of information. The chief political constraint is the credibility of the source of information. He contends that the rural poor and under-privileged will have a built-in bias against information from governments unless those governments have taken some far-reaching socioeconomic measures to improve their living conditions. Also, information from governments generally tends to be "self-serving and uncritical" (propaganda). Consequently, there is very often a credibility gap between governments and people, especially the rural poor. The technical constraint is the lack of significant leadership within a development project, and may impede both administrative planning and implementation. According to McAnany, rural projects are often limited by the lack of qualified personnel. He thinks that political and technical constraints require an integrated solution. For instance, he contends that if a country is politically committed to the task of bringing about equity, structural change in the socioeconomic system may be necessary to ensure an effective change. And if a country does not subscribe to equity, the country will have to take some technical measures in order to bring about greater benefits for the rural poor. In either case, a measure of social-structural transformation is required.

At political and administrative levels there should be a serious political commitment on the part of governments for improving the conditions of the rural poor. And at technical
and implementation levels there should be an analysis of different substantive areas of rural change projects in which a trade-off between resources and information can be made clear.32

The main features of these two analyses may be summarized in this way: Parker's model implies that a higher percentage of information activity in a developing economy can engender more rapid development and more equitable distribution of wealth, between urban and rural communities, on the one hand, and between less and more-developed countries, on the other. McAnany's analysis suggests, however, that there is the need for a serious government commitment towards rural development and that, technically, development policies naturally require social-structural reforms. Thus, the required approach is to reconcile between political and technical problems through an integrated solution at both levels.

The Central Features of the Old Economic Development Paradigm

The old paradigm of economic development was characterized by seven key features:

1. Low-income economies by themselves can not generate growth because of internal socioeconomic constraints. Economic growth can only be generated in these economies through external factors;

2. Development meant economic growth through a sustained increase in a country's Gross National Product (GNP);
3. Industrialization is a prerequisite for economic development because industrialization brings about growth and socioeconomic progress generally;

4. Industrial development is a prerequisite for modernization (transformation) of a country's socioeconomic base (from agrarian to industrial base);

5. Central planning of economic development: this meant the initiative of the government; top-down administrative approach, and exclusion of local participation in the planning and implementation of development programmes;

6. Economic development was based on capital-intensive technology. This implied massive capital investment;

7. Finally, either balanced growth (the development of both agriculture and industry, side by side), or unbalanced growth (the development of 'leading sectors' that induce supply and demand in specific areas and hence generate growth.

The Central Features of Communication Approach to Economic Development Under the Old Paradigm

The role of communication in development under the old paradigm assumed certain characteristic features:

1. Mass communication was viewed as a prerequisite for economic development. Communication should create a "climate for development," should widen horizons, raise aspirations, and focus attention of all people. And where the development of information media was inadequate, it was necessary to provide
for them to ensure the flow of information for development purposes;

2. Mass communication was seen as both instrument and index of development. The development of communication system and political participation on the one hand, and the media usage as well as the diffusion of knowledge and technical skill on the other, were seen as reflections of development;

3. Mass communication was regarded as an effective instrument for economic development: it was looked upon as the means by which social problems of development should be addressed and their possible solution rapidly passed on to a mass audience;

4. Mass communication was seen as powerful, direct and widespread in its effects;

5. The pattern of communication was a one-way flow from the top to the bottom of the social structure; this was parallel to the top-down and centralized approach to development. Bottom-up communication was hardly considered important.

**Evaluation of the Old Paradigm**

The economists and communication thinkers all assumed that the western model is both an ideal and universally applicable, irrespective of the differences such as culture, historical experience and socioeconomic system, because the western model is rational, scientific, technical, and hence progressive and practical. It is progressive and practical because the western experience depicted for those thinkers and planners an ideal
concept of development in the contemporary world.

However, this study will show that the western model cannot be implemented as such without a qualification. The model was not generally applicable in non-western societies without modifications regarding differences in culture, socioeconomic system, historical experience, and so on. Moreover, from both economic and communication points of view, the old paradigm's approach to development in less-developed Ghana was paternalistic and did not account for the different political ambition for national autonomy which motivated so many Ghanaians to make such huge investment for the development of infrastructure in developing Ghana.

Definition of Terms Used in This Analysis

International development is used to imply a development cooperation between one country (recipient) and another country (donor) or a group of countries and private organizations (donors) in a particular field of social or economic endeavour in the recipient country. This usually involves the transfer of resources like capital (financial and human) and technology (including technical knowledge and skill) from the donor to the recipient country. It is also a negotiated development arrangement in that it is largely extended to the recipient country upon a request for such assistance.
Next, international communication is here defined as an instrument and process by which individuals, groups, or nations are mutually related for specific interests and purposes. Instrument in this regard is used to refer to the medium by which this interaction is achieved, while process implies the courses of action taken to reach the immediate and long-term set and implied goals of those involved.

Finally, by an effective system of communication, as used throughout this study, it is meant that available channels of communication are used, like the mass media and interpersonal communication, in such a way that two-way or multipurpose flow of communication results. This will require access to the channels of communication as well as the provision for alternative or additional means of communication, such as the establishment of consultative advisory bodies, at both local and governmental levels.

The Review of Literature on the VRP

Since the VRP was completed fourteen years ago, the project has been studied from different aspects. But none of the studies made so far have attempted to evaluate the project in terms of development and communication and the western theory of development, especially in the 1950's.
The VRP has been studied from four main perspectives: historical, economic, social and political. From the point of view of history, the most significant writing on the project from among available secondary sources, and besides primary sources, is Moxon's book about the VRP, published in 1969. This book is significant because it provides an important and factual account of the project, especially in terms of the project's colonial and post-colonial origins. Nevertheless, it has no theoretical base. From an economic point of view, the major area of concern in the study of the VRP since 1966 has been the economic implications of the project for the Ghanaian economy.

The most outstanding economic analyses of the VRP are those of Killick (1966) and King (1966), both of which dealt essentially with the economic and financial prospects of this project in developing Ghana, especially in the 1960's. When Killick studied the economic implications of this project in 1966, he concluded that the VRP was a significant and valuable contribution towards Ghana's economic development, but not a panacea, because, in his view, there were no panaceas. According to Killick, the VRP's major contribution was the provision of power in Ghana. He saw no prospects for an integrated aluminium production in that country because Ghana's agreement with VALCO regarding the VRP did not guarantee a firm commitment towards that goal in the foreseeable future. Although some of
Killick's predictions, especially regarding the future of Ghana's aluminium industry, have come true, his economic analysis of the VRP was a projected evaluation of the project at national and international levels. Also, his analysis was not linked to any theoretical framework. Nevertheless, it can be regarded as an important contribution to the body of knowledge about the VRP because it provides a detailed socioeconomic appraisal of the project. Similarly, in his financial appraisal of the project regarding demand for power in the Ghanaian economy for industrial and social uses, King thought that the gain from the sale of power would be modest in the immediate future. He explained that Ghana's economic capacity in terms of purchasing power (incomes) was low because of the economy's weak industrial and agricultural base (in terms of growth, diversification and productivity).

In the social context, most studies on the VRP have largely dealt with three main consequences of the project: first, health and environmental problems created by the formation of the lake; second, the immediate effect of the VRP on the people displaced by the formation of Volta Lake; and third, subsidiary benefits derived from the VRP. According to several studies made on the ecology of Volta Lake, such as those of Klump and Chu (1977), Omo-Fadaka (1972) and Waddy (1966), the creation of the lake has aggravated diseases like schistosomiasis (bilharzia) and onchocerciasis (river blindness) in the
Volta Basin, which are inimical to health and hence pose great public concern. For instance, the study of Klump and Chu in 1977, with the support of the World Health Organization (WHO), which scientifically analysed the ecological consequences of Lake Volta, traced the cause of bilharzia in the Volta Basin to the formation of the lake. Other studies, like those of Omo-Fadaka and Waddy, have also shown that bilharzia and river blindness endanger the lives of the inhabitants of the Volta Basin, especially the fishing communities.

Many thousands of people who were resettled because of this project are yet to regain their former identity as socially and economically viable societies, despite the effort made by the Government of Ghana to help them to establish a sound socio-economic base in their new settlements. The resettlement and agriculture scheme planned for the settlers by the government was unable to achieve that goal because of administrative, social, and economic difficulties. This was the keynote of an evaluation study of the resettlement and agriculture scheme carried out in an international symposium in 1965, in which the policy, administration (planning and implementation) and socioeconomic consequences and future implications of the scheme for the settlers were discussed. It was organized by Ghana's University of Science and Technology (UST) and the Volta River Authority (VRA) and has been published in a book entitled, The Volta Resettlement Experience (ed., Chambers, 1970). The
The significance of this study lies in the fact that it constitutes the most exhaustive factual account and appraisal of the scheme. However, it cannot be regarded as the most up-to-date, because it covers the resettlement exercise and its immediate consequences for the settlers.

The VRP's major subsidiary benefits were fresh water (lake) fishing, inland water transportation and irrigation farming. The utilization of these benefits has been studied in terms of their potentialities, extent of development, and socioeconomic impact. Despite an early showing of abundant supply of fish from the Volta Lake, which in turn became an important source of employment for the inhabitants of the Volta Basin (Abhayankar (1964), Lawson and Akwei (1974)), the peak of abundant fish supply (Vanderpuye (1972)) was reached in 1969. Also, the development of Lake Volta's fishing industry (Lawson and Akwei 1974) was inadequate in terms of fishing facilities and infrastructure (access roads). Hilling's appraisal of Lake Volta's inland water transportation in 1977 is very significant, because it provides a comprehensive analysis of the inland water transportation system since its operation in 1970.

Of all the VRP's subsidiary benefits, irrigation farming is the most inadequately evaluated, partly because it is the least developed. The analysis of O'Connor (1978) of some of the VRP's irrigation schemes and the accounts given in the 1975
and 1976 VRA Annual Reports about some of the VRP's experimental irrigation projects on the Accra Plains, provide some insight into the extent to which the irrigation farming of the VRP has developed and with what degree of success or failure.

From the political point of view, most writings on the VRP have largely dealt with the political implications of this project at both national (Davison (1954)) and international (Jackson (1964)) levels, because of the project's national and international significance. But none of them has so far stressed the communication element of international development. And the only evaluation of the project so far from a political economy point of view since its completion is that carried out in 1980 by a correspondent of the authoritative London-based West Africa magazine. The correspondent saw the VRP as a distorted and uneven development of Ghana's two valuable natural resources (water and bauxite) because the project failed to provide the much needed expansion of the Ghanaian economy both at national and international levels. Apart from this, the political ramifications of the project at national and international levels remain unevaluated, at least at the time of writing.

The western participation in the VRP was politically and ideologically motivated, although it had its economic goals as well. Ghana's assumed leadership as the vanguard of dependent Africa was politically appealing to the west. As the Economist
of London noted in 1958, "If the economics of aluminium still looks unfavorable, the political conjuncture is propitious." Ideologically, the West wanted to ensure that their interests in Ghana and Africa at large were secured. Even if Ghana would not follow the capitalist system as her pattern of development, the West would like to see her stay in the true course of non-alignment.

It follows from the above that, in order to fully understand the VRP in the context of international development and communication - and hence appreciate its consequences both at local and international levels - it is essential to take into account development and communication theories as advanced by Lerner (1958; 1963, ed. by Pye), Schramm (1964) and Rogers (1969) and the western theory of development as analysed by Lewis (1955), Nurkse (1953), and Hirschman (1958) in the 1950's and 1960's. These factors are relevant for a number of reasons. First, it has been emphasized that communication has an important direct role to play in economic development. In the study of the VRP, for instance, because of certain social, economic and administrative problems, the resettlement and agricultural scheme of the project was not only costly but also largely unsuccessful.

According to Scudder (1966), owing to insufficient time to prepare the socioeconomic base for the resettlement and agricultural scheme, the opportunity to fit the settlers into a well-planned social and economic system from the beginning was lost. This was partly, if not largely, due to the absence of an effective system of communication conceived during the
planning of the project. Thus, the VRP, as Lumsden (1973) has noted, poses an important question: "To what extent does 'national' economic development take precedence over, or justify the neglect of, the rights of local interests?" as was done in the VRP. He felt that the interests of local people were given less attention in the planning and implementation of the VRP. The instances cited above suggest that there was inadequate planning for the VRP at the local level.

In addition to providing a factual account of the costs and benefits of the VRP, this study will show that there was the need for an effective communication system in planning and implementing a development scheme like the VRP, and how many of the social and economic costs were unnecessary in that they could have been avoided by effective communication. Second, as already indicated, the VRP was conceived in the context of western development theory as advanced by Lewis, Nurkse and Hirschman in the field of development economics and by Lerner, Schramm and Rogers in the context of development and communication in the 1950's and 1960's. In the analysis of this project, therefore, it will be inappropriate to ignore or take for granted the theoretical implications of this project in this period. Finally, although this study does not provide answers to some of the problems posed by other studies on the VRP, in addition to stressing the need for an effective communication in the planning and implementing of development projects, like the VRP, and economic development generally, it draws attention to problems of international development as a means of international communication.
Background to the Study

I originally planned to study Canada's development assistance to Ghana from 1957 to 1966 (the period of Nkrumah's rule) in the context of international development and communication. My efforts to obtain adequate information on selected Canadian development projects in Ghana in this period from the Governments of Canada and Ghana (through the Canadian International Development Agency (CIDA) and Ghana High Commission in Ottawa, respectively) were unfruitful. I therefore decided to study the VRP in the context of international development and communication.

Canada became involved in the VRP in the 1940's through Aluminium Limited of Canada (Alcan). But Alcan withdrew from this project in 1958. In 1966, Canada became involved in further development of this project through CIDA, which contributed $9.2M towards the financing of the Volta Power extension project which cost over $20M.39 And in 1977, CIDA provided the consultancy and equipment components of Kpong Hydroelectric Project, which is a subsidiary of the VRP, at the cost of $35M.40 In addition, CIDA has provided different forms of economic assistance towards Ghana's industrialization and agriculture programmes initiated by the VRP. The building of Accra Trade Training Centre (ATTC) and Kumasi Technical Training Institute (KTTI), as well as the Kpong Irrigation Project, are examples of Canadian aid. And in 1977/78, Canada's annual flow of aid
to Ghana was $14,345,000,\textsuperscript{41} while the country's volume of trade (in terms of value) with Ghana, especially since the 1960's, has been relatively high. Whereas in 1957 Canada's exports to Ghana and imports from that country were $1,244,000 and $5,989,000, respectively, in 1977 Canadian exports to Ghana were $24,773,000, while imports from Ghana to Canada were $4,671,000.\textsuperscript{42} The total volume of trade (exports and imports) was $29,444,000 in 1977, as compared to $7,233,000 in 1957,\textsuperscript{43} a 60.5 per cent rise within a twenty-year period.

The western 'interests' in Ghana, and involvement in the VRP in particular, must not be seen exclusively as a U.S. affair, but in a wider western political and economic interest in Ghana; and participation in the project in particular, at different stages in the development of this multi-purpose and huge development project, viewed as instrumental in Ghana's economic development. The main point here is that other western countries like the U.K., West Germany, France, and so on, have, at different times, been involved in the VRP's development and in the development of Ghana at large. In 1979, for instance, the Governments of Ghana and West Germany signed a technical assistance agreement for further development of Volta Lake's inland water transportation (Ghana News, 1979).

This study is divided into eight main chapters, including introduction, which constitutes the first chapter. In Chapters II and III, the origins and objectives of the VRP are dealt with, respectively. In regard to the origins, the VRP was conceived and originated as an economic venture in colonial Ghana (Gold
Coast) between the British Colonial Administration and Aluminium Limited of Canada (Alcan) and British Aluminium Company (BACO). The VRP was primarily intended to provide an abundant supply of power for the production of aluminium and to initiate the Gold Coast's industrial and social development in the 1950's. Because of rising costs and other factors, however, this project could not be implemented. In post-independent Ghana the VRP was implemented after revising the size and scope of the project. In dealing with objectives in Chapter III, the concerns, motives and interests, as well as beliefs and perceptions of the parties involved in the VRP both in the 1950's and in the 1960's, are emphasized in relation to the VRP's origins.

Chapter IV examines the implementation and financial estimates of the VRP, stressing the factors that influenced the VRP in the process of its implementation. In Chapter V, the intended consequences of this project are analysed in relation to its main objectives such as the development of power, aluminium production, industrialization, and so on. It is indicated that availability of power alone could not engender industrial development. In addition to political stability, there were other factors like financial and human capital, technology, knowledge and skill, adequate supply of raw materials, imported or domestically produced, and so on, which have bearing on industrial expansion.

Chapter VI gives an account of unintended consequences of this project. It reveals that the VRP's unintended consequences have been both beneficial and detrimental economically and socially. In Chapter VII, the VRP is finally evaluated in terms
of its assumptions and consequences. The main thrust of this chapter is that as an instrument of economic growth and social change the VRP has had diverse ramifications from social and economic points of view and in the context of communication at both national and international levels. Chapter VIII summarizes the main conclusions of the study, looking at the VRP in the context of development and role of communication as well as the theory of development. The summary is ended with the final conclusions drawn about the VRP.
Post-Independence Administrative Regions of Ghana

Figure 2

NOTES

1 Robert W. July has observed that because a large-scale peanut project initiated in Tanganyika (Tanzania) in 1947 by the British government was launched without sufficient examination of soil character, climate conditions, and the experience of African farmers, the scheme ended in total disaster after only three years (Robert W. July, Pre-Colonial Africa: An Economic and Social History (New York: Charles Scribner and Sons, 1975), p. 4). And according to Arthur W. Lewis, the peanut scheme cost £25 million, at the rate of £700 per worker (Attitude to Africa, William Cloves and Sons Ltd., ed. (London: Penguin, 1951), p. 71).

2 Note also that, like Ghana's VRP, the Aswan High Dam fell, somewhat fortuitously, into the laps of the Revolutionary Command Council (RCC) of Egypt after the military takeover in July 1952. But once before them, the project's political advantages as well as its economic strengths, became immediately apparent. Politically, it had the advantage of being big and daring, "thrusting Egypt into the vanguard of modern hydraulic engineering" (John Waterbury, Hydropolitics of the Nile Valley (U.S.A.: Syracuse University Press, 1979), p. 99), not to mention also the fact that during its construction and after its completion, it would be "highly visible and fittingly monumental" (Ibid., p. 99). In addition, it would meet the well-known problems of over-year storage scheme. Economically, the project held out the prospect of improving Egyptian agriculture while simultaneously furnishing a cheap source of energy to fuel the transformation of Egyptian society to an industrial nation. Finally, it was believed that the High Dam would be completed in a decade and that it would cost no more than any of its alternatives, such as the projects comprising the Century Storage Scheme (Ibid., p. 99).


4 Ibid., pp. 382-385.

5 Ibid., p. 365.
After a visit to the Gold Coast in 1953, Arthur W. Lewis, a West Indian, who was Chairman of Manchester University's political economy department in England since 1948, published a report on Ghana's industrialization possibilities (Report on Industrialization and the Gold Coast, Government Printer, Accra, 1953). And from 1953 to 1956, he was the Government of Ghana's VRP consultant on economic matters. Arthur Lewis was named an economic advisor to the Government of Ghana in 1957, having been referred to Ghana by the U.N. Technical Assistance Administration. He won the 1979 Nobel Prize for Development Economics in the field of Agriculture.


Ibid., p. 16.


Ibid., p. 49. There is now a new approach to development. The new development approach has been summarized by Rogers in the following terms: First, there should be equality in the distribution of information and socioeconomic benefits in order to close the socioeconomic gaps between urban and rural areas; second, development should be decentralized so as to promote popular participation in self-development planning and execution; third, self-reliance in development, employing local resources as far as possible; and finally, traditional and modern systems should be integrated through a combination of old and new ideas.
as far as possible (such as the integration of traditional Chinese medicine with western scientific medicine in contemporary China or [in contemporary Ghana]). And according to Rogers, under the new development approach the main roles of mass communication should be: first, to provide technical information about development problems and their possible solutions and about appropriate innovations in response to local requests; and second, to spread locally information about development achievements of successful local groups so as to serve as useful examples for other local groups to follow. Everett M. Rogers, "Communication and Development: The Passing of the Dominant Paradigm," Communication Research, April, 1976, pp. 222-223; 233.


13 Ibid., p. 119.

14 Ibid., p. 117.

15 Ibid., p. 120.

16 Ibid., p. 120.

17 Ibid., p. 144.

18 Ibid., p. 115.

19 E.M. Rogers, "Communication Research and Rural Development," The Canadian Journal of African Studies, 1969/70, 3, p. 216 (See Footnote 1). Note also the fact that Rogers defines "development" as "a type of social change in which new ideas are introduced into a social system in order to produce higher per capita incomes and living standards through more modern production methods and improved social systems".

20 Ibid., p. 217.

21 Ibid., p. 216.


In his book, The Strategy of Economic Development (New Haven: Yale University Press, 1958), Albert O. Hirschman has criticised the balanced growth theory advanced by A.W. Lewis and Ragnar Nurkse in the 1950's as being ineffective. He has suggested the unbalanced growth theory based on an idea that sectors that induce supply and demand ('leading sectors') should be developed in that they would create bottlenecks for demand. Growth could be achieved through disequilibrating investment which would create demand in the form of bottlenecks. And infrastructure should be provided by the government in order to create investment climate which would make possible the working of the price mechanism under disequilibrium situation.

It should also be noted that the only country where the concept of Balanced Growth has been tried with any degree of success is China. But the Chinese concept of balanced growth is different from the western concept of balanced growth: demand and supply (Nurkse), and agriculture and industry (Lewis). The Chinese concept of balanced growth is based on Mao's philosophy of "walking on two legs." The three great gaps in economic development were seen by Mao as being between menial and mental labour; urban and rural life; agriculture and industry (See Suzanne Paine, "Development with Balanced Growth: Maoist Conception and Chinese Practice," World Development, 1976, 4(4), pp. 277-304. Finally, the concept of growth as advanced by Nurkse and Lewis on one hand, and the concept of unbalanced growth as introduced by Hirschman, on the other hand, all implied structural transformation. Hirschman's conception of unbalanced growth implied a theory of induced structural transformation.


41. Ibid.


43. Statistics Canada (April, 1978).
CHAPTER II

ORIGINS OF THE VRP

International Origins of the VRP

The term "origins" as used in this context implies events that led to the conception of the Volta River Scheme and circumstances and factors that brought about its possible, and sustained its ultimate, realization.

The VRP grew out of the desire of governments of the United Kingdom (U.K.) and the Gold Coast (Ghana) as well as Aluminium Limited of Canada (Alcan) and the British Aluminium Company (BACO) to develop and put into use two natural resources in Ghana in the 1950's. The resources were extensive bauxite deposits at both Yenahin in western Ashanti and Mpraeso in Kwahu and the hydroelectric potential of the Volta River in Ghana (see Fig. 3).

Conception

The conception of this project originated with the discovery both of bauxite deposits in 1914 and Volta's great hydroelectric potential in 1915 in geological surveys in Ghana by A.E. Kitson, first director of the Gold Coast Department of Geological Surveys, formed in 1913. In his report, Kitson pointed out that
VOLTA RIVER PROJECT: BAXRITE DEPOSITS AND PROPOSED RAILWAYS FOR ALUMINIUM INDUSTRY IN GHANA

Figure 3

Key

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the development of the Volta River could be a source of hydro-electric power for the production of aluminium from local bauxite and suggested Akosombo as a possible site for a dam. The Gold Coast Colonial Government did not take any action until 1925, when the government published an official bulletin, drawing attention to the hydroelectric and aluminium production potential of the Volta River. Ever since, proposals, based on private and public investigations, have been brought forward for the realization of that dream.

Private and Public Interest

Interest in this scheme was first revived in 1938 when Duncan Rose, a South African geologist, re-examined the Volta River scheme proposals. Encouraged by them, he started scientific investigation in 1939 into the possibilities of harnessing the waters of the Volta River for the generation of electricity for the production of aluminium. But his follow-up investigations, which he considered necessary for an effective implementation of the scheme, were interrupted by the outbreak of World War II. When Rose resumed these investigations in 1945, he formed West African Aluminium Limited (Wafal) and secured mining concessions in Ghana. In September 1949, Wafal published the report of its investigations, which envisaged an integrated aluminium scheme consisting of the development of power and bauxite mines in Ghana.
In the same year, Wafal was joined by the United Africa Company (UAC), Alcan and BACO. Both Alcan and BACO had bauxite concessions of their own in Ghana. Alcan acquired its bauxite concessions in 1947, while BACO had been operating bauxite mines (at Awaso in the western region) in Ghana since 1934. In November 1953, Alcan acquired a controlling interest in Wafal.

Joint Mission

When Wafal was conducting its post-war investigations, a joint mission of Alcan and BACO was also re-examining the practicability of aluminium production in both Ghana and North Borneo. The aim of the mission was to develop an integrated aluminium industry within "the sterling area," either in Ghana or North Borneo. In 1950 the Joint Mission reported that the VRP was a sound economic and engineering venture. In January 1951 the Joint Mission again reported that, while both countries were suitable for the development of aluminium production, Ghana was more preferable because the combination of large bauxite reserves and greater hydroelectric potential made a larger production capacity attainable. But there were other factors involved as well.

Economic Interest

In the late 1940's, the British government was considering the need for large-scale aluminium production either in the Gold
Coast or in North Borneo. At that time, there was a serious shortage of aluminium in the world. Moreover, all of the aluminium that Britain could obtain was from hard currency (dollar) areas, like Canada. Britain very much wanted to conserve rather than to spend their dollar reserves. The proposed aluminium scheme in the Gold Coast from local bauxite reserves appeared more favourable than that of North Borneo: not only would the aluminium come from a British colonial territory, but also from a soft-currency (sterling) area. Britain, therefore, offered to bear the cost of Wafal's investigations under the Colonial Development and Welfare Act.

**Political Factors**

In January 1948, a march by ex-servicemen, protesting the post-war conditions, triggered public disturbances in Accra (capital of Gold Coast) and some other key towns in the country. At least 16 persons were killed and over 100 others were injured when the ex-servicemen rioted in Accra and other towns, looting and burning shops. This led to the appointment of a Royal Commission of Enquiry in 1948 to investigate the disturbances. The Commission found that people were disgruntled about controls, shortages, high prices of imported goods, and the colonial government's neutral position during a dispute over these matters.

Several other factors also contributed to the staging of the protest march, but there were two key ones. First, the demobil-
ized Gold Coast soldiers, who had seen better living conditions and had become politically conscious during their experiences abroad, returned to the Gold Coast and were dissatisfied with the post-war conditions in their country. Second, the measure of local participation in government granted in 1946 had heightened political agitation in the Gold Coast in the post-war years. The educated Ghanaians, who were anxious to take an active part in politics, were dissatisfied with the rule through the chiefs by the colonial government. Radical politicians, like Kwame Nkrumah, considered the 1946 (Alan Burns') constitutional reform inadequate in the contemporary Gold Coast.

In August, 1948, when the Commission investigated the Gold Coast situation, they stated that the most serious problem which the Gold Coast government had to face was "the suspicion which surrounds government activity of any sort." The Commission saw this suspicion as "an attitude of mind based on no specific grievances." The effect of this was unhealthy relations between "government and governed" in the Gold Coast. They firmly believed that "only by some real and far-reaching positive action" in political, economic, and social fields could that suspicion be removed and, hence, healthy relations be restored. The Commission recognized that heavy industries in the Gold Coast could not be envisaged owing to lack of energy and other resources. But they saw the possibility for light industry with the development of the Volta scheme as a source of power. The Commission observed:
To harness the waters of the Volta, for the production of electrical energy and its utilization among other things in manufacture of aluminium alloy on the spot, we believe is a scheme which has passed the visionary stage. Such a scheme, so far as yet seen of great expansion, might well enable large tracts to become fertile by irrigation. At the same time, the surplus electrical energy set free could be utilised to great advantage in hundreds of ways not calling for any great imagination. 10

The Commission identified the problems in agricultural development as the absence of alternative crops to cocoa and the excessive attention being given to export crops as compared to crops for home consumption. They also drew attention to the absence of specific plans for future development, and the political seriousness of the present indecision.

The Action of the British and Gold Coast Governments

In the light of both Britain's own economic interest in the VRP's development and political concern for the development of her colonial territory, the British and the Gold Coast governments jointly decided that not only should the feasibility of aluminium industry be officially examined but also that the whole potential of the Volta Basin should be explored. Therefore, in October 1949 they retained William Halcrow and Partners to carry out full investigation of the potential value of the River Volta to the economy of the Gold Coast, taking into account power, irrigation, transportation and communication.

In July 1950, Halcrow and Partners submitted a preliminary report which indicated that, although the hydroelectric scheme
was an engineering possibility, it would not be economically feasible unless an aluminium industry were established which could absorb a considerable proportion of electric power, and that the success of the scheme depended, among other things, on aluminium production which would use local bauxite reserves. In their final report, submitted in August 1951, they indicated that without an aluminium smelter that would consume a considerable part of the VRP's power, it would not be economical to build a dam for the production of hydroelectric power. Thus, the smelter became an important element in the Volta Project.

**Exploratory Talks**

In October and November, 1951, and in May and June, 1952, both in London and Accra, representatives of the U.K. and Gold Coast governments, Alcan and BACO held exploratory discussions on the report of Halcrow and Partners. As a result of these talks, they recommended the formation of a preparatory commission "to carry forward the work which had already been done in investigating the Volta Project and to advance the planning of the scheme to a stage where a decision could be made whether it should be undertaken." The British government's White Paper on the VRP, published in 1952 shortly after the talks, stated:

Her Majesty's Government in the United Kingdom are favourable in principle to participate in the scheme which would further their policy of encouraging the development of the resources of the Commonwealth as well as contribute to the raw material needs of the United Kingdom. They believe,
on the basis of information so far available that its successful completion would bring substantial benefits to the two countries.\textsuperscript{14}

The White Paper further emphasized that because of its magnitude it should not be embarked upon without every practicable assurance that it could be carried through to a successful conclusion. Therefore, with the agreement of all the parties they proposed that a preparatory commission be set up immediately to follow up the work already done and to examine in greater detail the chief problems which were to be overcome.

In 1953, a preparatory commission was set up, headed by R.G.A. Jackson. After three years of exhaustive investigation, having covered such major aspects of the scheme as economic and financial, sociological, health and sanitation, technical, legal and administrative, labour, communication and logistics, the commission reported in January, 1956 that this project was "technically sound and economically attractive."\textsuperscript{15}

**Negotiations**

In 1956, negotiations based on this report were started, both in Accra and London, but they broke down because Alcan wanted to be assured in advance of a long-term rate for the price of power. This was not possible. Later in that year, Alcan and the governments of Ghana and the U.K. issued separate statements explaining the circumstances leading to the breakdown of the negotiations. In their statement, Alcan indicated that since
1952 several significant forces bearing on the future of the VRP had been at work which had affected the attraction of the Volta scheme. These forces had rendered the 1952 VRP framework out of date. In Alcan's view, the previous four years had witnessed a continuous inflation in construction costs, rising interest rates, and the possibility of further rises in costs and interest rates. These all had a special bearing on the Volta Project owing to the lengthy construction period for the dam. Consequently, it was becoming increasingly difficult to forecast the operating costs of the project. Because of these developments, the prospective return on capital, Alcan pointed out, was substantially lower than that previously estimated. But the company continued to believe that the Volta Project could be developed satisfactorily provided it was possible to make satisfactory arrangements for financing and the division of responsibilities and risks.16

The statement of the Gold Coast government also indicated two basic conditions which had to be satisfied: first, a negotiations of an agreement satisfactory to both the two governments and the aluminium companies; and second, a most careful assessment of all the financial implications of the project, particularly as they were related to the Gold Coast and other developments desired by the country.17

Finally, the U.K. government in its statement reaffirmed its interest in the project, but pointed out that it was not committed to participating in it. The statement also added that all the parties involved had agreed that, because of the sub-
stantial increase in the estimated capital cost of the project, it was necessary to review both the framework and the methods of finance. As a next step, The International Bank for Reconstruction and Development (IBRD) was to be invited to make a general assessment of the project with a view to assisting in the project's financing. 18

By April, 1956, according to excerpts from Government Statement on "The Volta River Project," it was clear that the implementation of the VRP was a remote possibility. 19 As Robert Jackson observed, it became clear in the London talks in March 1956 over the VRP that the project could only be justified economically if Alcan was prepared to buy power for a long period. 20 In 1958, Alcan ultimately withdrew from the VRP venture, explaining that the company was not in the position at that time to participate in the venture and that Alcan did not want to stand in the way of any aluminium enterprise that might be interested. 21 My attempts to obtain Alcan's present views on their withdrawal are unsatisfactory.

The World Bank

Following the group's suggestion, the Government of Ghana made an arrangement for a delegation to discuss the project and the possibility of a loan to finance it with the World Bank. K.A. Gbedemah, Minister of Finance, led this delegation in May, 1956. The delegation indicated that membership in the International Bank for Reconstruction and Development would be
sought as soon as Ghana became independent, which it would be the following year. It also explained the purposes and estimates of the scheme to the President, Eugene Black, and the Executive Directors of the bank.

In November, 1956, prior to considering independent Ghana's application for membership in the Bank, a mission from the World Bank visited the Gold Coast and carried out a routine examination of the country's economy. And the World Bank mission conducted a preliminary appraisal of the VRP, including the project's possible effect on the general economy of Ghana.

The World Bank admitted the newly independent Ghana to its membership shortly after independence, but in its report published in June 1957 did not consider that the project, as then envisaged, would be justified at that time in Ghana's economic development, although the report stressed the long-term benefits of the scheme.

However, the Bank in this study realized that the Government of Ghana believed that the economy of that country would assume an entirely different outlook if and when the VRP was financed and that the idea of the project would not be abandoned because it was an important element in the economic thinking of the Ghanaian government.22

United States Government

The U.S. government's interest in the VRP and Ghana in general begins in the mid'1950's. In 1954, a team of American businessmen, headed by R.V. Wood and A. Hehmeyer, were sent to
the Gold Coast by the U.S. government under its Point Four Technical Assistance Programme, and with the consent of the Gold Coast government, surveyed trade and investment opportunities in that country.

The objective of the team was to explore further and to publicize the potentials of the Gold Coast economy and to encourage the creation and expansion of independent African business enterprises. It was also interested in having laws made relating to the formation and management of capital to fit the needs of a growing private economy. In their report of January 1955, the team identified the development of hydro-electricity and aluminium production as the key investment opportunities in the country.23

In 1957, while attending Ghana's independence celebrations, U.S. Vice-President Richard Nixon told Ghanaians in a press conference that the U.S. government was ready to assist Ghana to develop her productive capacity. He also mentioned the fact that he and Dr. Nkrumah had discussed the proposed Volta River Project, in which British and Canadian groups had shown primary interest. According to Moxon, possible U.S. assistance was conceived in Carl Flesher's theory of "using private enterprise in our foreign aid programme."24 Flesher's idea was that the U.S. government should share in lending Ghana the necessary money to build the dam and power station while private enterprise, with or without government assistance, could build, own, and operate the aluminium smelter.
After the breakdown of the 1956 negotiations between the various interested parties, the Government of Ghana approached the President of the United States of America to ascertain whether that government would be prepared to assist in bringing the VRP to life. Meanwhile, in October 1957, in the U.S. an unexpected incident occurred involving K.A. Gbedemah, Ghana's Finance Minister. Gbedemah was discriminated against in a public restaurant at Dover (Delaware), when he and a black American friend, Bill Sutherland, were told, "colored people are not allowed to eat in here."25 This became a news story and attracted public attention. Consequently, as a gesture to the Minister, the State Department invited Gbedemah for a dinner. And Gbedemah seized the opportunity to brief the U.S. officials and President Dwight D. Eisenhower about the Volta Project's financing problem.

During an official visit of Nkrumah to the U.S. in July 1958, the Volta matter was again raised, this time by Nkrumah. Later, in a joint statement, the U.S. and Ghanaian governments agreed to bring up to date the engineering reports and to share the cost.26 The Henry J. Kaiser Company of Oakland in California did the appraisal, which was published in February 1959. In January 1961, a new administration came into being in the United States, when John F. Kennedy assumed office as the U.S. president. In early 1961, George Ball and Abram Chayes of the State Department asked Barbara Ward (Lady Jackson), who was interested in the economic and political development of Ghana, to raise the Volta Project matter with President Kennedy.27 Barbara Ward's
counsel eventually reinforced President Kennedy's own instinct to go ahead with the project.\textsuperscript{28} In March of that year, Nkrumah himself, on a visit to the U.S. for the United Nations General Assembly, met President Kennedy at the White House and the VRP was discussed.

\textbf{Volta Aluminium Company (VALCO)}

Kaiser's involvement in the VRP was somewhat dramatic. According to Jackson, when Mr. Kaiser presented his report to Dr. Nkrumah, he was asked to form an aluminium company that would consume sufficient power to justify the project. This was how Volta Aluminium Company (VALCO) originated. In September 1959, the Kaiser Aluminium Chemical Corporation assembled a consortium consisting of themselves, Aluminium Limited of Canada (Alcan), Reynolds Metals, the Aluminium Company of America (Alcoa) and Olin Mathieson. This group established a limited liability company, registered in Ghana, known as the Volta Aluminium Company. In 1960, Alcan and others left this company, leaving Kaiser Aluminium and Chemical Corporation and Reynolds Metals, each with 90 per cent and 10 per cent, respectively, of the equity capital. In December 1959, Dr. Nkrumah on behalf of Ghana, and D.A. Rhodes, President of the Kaiser Aluminium and Chemical Corporation, on behalf of VALCO signed a "letter of intent" which implied that VALCO had agreed in principle to participate in the VRP;\textsuperscript{29} VALCO later became a partner in the VRP.
National Origins of the VRP

On the national level, a Royal Commission of Enquiry headed by Aiken Watson investigated, in 1948, disturbances in the Gold Coast and in its report recommended the development of the VRP to which reference has already been made. The VRP was again discussed publicly and gained general prominence during the campaign for the first general election in the Gold Coast (Ghana) held in February 1951, at which time the politicians of the Convention People's Party (CPP) began to talk about the realization of this project. In the Party's election manifesto for that general election, and for the subsequent elections in 1954 and 1956, the CPP made reference to "harnessing electric power from the Volta River for industry and for lighting up of our towns and villages." The CPP government impressed upon Ghanaians that the economy of Ghana would change in character if the VRP was implemented. It became the cornerstone of the economic policy of the ruling CPP government until its ultimate realization in the 1960's. The Gold Coast government's statement on the development of the Volta River Basin stated:

In the view of the Gold Coast government the success of this project would be of great benefit to the inhabitants of the Gold Coast and Togoland (Volta Region) as well as assisting with the supply of valuable commodities to great demand in world markets: this government believed that the project would bring employment to the many persons in the Eastern part of the Gold Coast and in Togoland under United Kingdom Trusteeship as the Gold Coast mines have been in the western part of the country, and would be a great source of wealth to the country and assist generally in the raising of the standard of living of the inhabitants.
To fulfill an election promise, the CPP government under Kwame Nkrumah, then leader of Government Business, decided to investigate in 1952 the possibility of using such power for large-scale aluminium production. In February 1953, the Gold Coast Legislative Assembly approved by 50 to 13 votes the establishment of a preparatory commission which was to determine the economic feasibility and priorities of the VRP. But during the debate both the CPP and opposition members indicated that the project was insufficiently controlled and that the Gold Coast government was "rushing" it through the legislature. 32 As R.B. Davison has observed (in 1954), "the Gold Coast government only succeeded in giving support for the motion to approve the establishment of a preparatory commission by a somewhat harsh application of the Whips," 33 and only after Nkrumah had assured the legislature that there would be ample time to debate the commission's eventual report before any final decision was made.

Meanwhile, when the British government's White Paper on Halcrow and Partners' report on the scheme was made available in Accra, it aroused a public outcry. It was feared that under the scheme the British government would be able to buy aluminium cheaply from the Gold Coast and sell it at profit to other customers. The Gold Coast also held a minority share in the VRP. Thus, it was suggested at a public debate by the People's Education Association (PEA) that the Gold Coast should aim at holding at least a majority share in the scheme so as "to eliminate the probable danger of an Anglo-Gold Coast-Canadian dispute." 34
But, according to Commerce Minister, Thomas Hulton-Mills, the proposed government equity contribution of £8 million (10 per cent) toward the project could have been set much higher had enough money been available.\textsuperscript{35}

Nonetheless, as mentioned above, in association with the British government, the Gold Coast government set up the Preparatory Commission in 1953 under Sir Robert Jackson to carry out a survey into the project's feasibility. Prime Minister Nkrumah announced in June, 1953 that a Gold Coast National Committee, consisting of ministers of finance, commerce and industry and three Africans nominated by the Legislative Assembly, would be set up to safeguard the interest of the Gold Coast at all stages of the Volta Project. Later in that year, the national committee for the VRP was established to act on behalf of the public interest and to provide liaison with the Preparatory Commission and ultimately to offer advice.

There were two main reasons for setting up this committee: first, the Gold Coast government wanted to make the project a matter of national concern; and second, it was formed to visit Canada and Britain in order to see a hydroelectric project and aluminium industry.

**Summary of the International and National Origins of the VRP**

The international and national origins of the VRP can be summarized in two main ways. First, in the 1950's the development of the VRP originated with the desire of the United Kingdom
(U.K.), Aluminium Limited of Canada (Alcan) and British Aluminium Company (BACO) to develop an alternative source of aluminium within the sterling area for the British aluminium market in either colonial Ghana or North Borneo. But the rising costs of the project in this period, among other things, became the major factor that delayed and ultimately hindered the implementation of this project.

By April, 1956, Alcan and the U.K. had indicated that they were still interested but not committed. Thus, the implementation of this project became uncertain. By the 1960's, the ultimate withdrawal of Alcan in 1958 as a major partner in this project had forced Ghana to negotiate with new partners. In 1961, VALCO, IBRD, Exim Bank and U.S. AID and ECGD of the United Kingdom Board of Trade became the Government of Ghana's new partners after several years of negotiations from 1958.

At the national level, the VRP was designed to provide a cheap power base for Ghana's social, agricultural and industrialization programme. The government was convinced that the development of the country depended primarily on cheap power resources because this was the basis of industrialization in the contemporary world. This was Nkrumah's own personal conviction.

The development of this project was linked with large-scale aluminium production so that it might be economically viable. It would have enabled Ghana to develop her extensive bauxite deposits into a large-scale aluminium industry and so would have helped to broaden the export base of Ghana's economy.
However, this objective could not be realized, because the project was revised in 1959 to make it less costly and thus economically attractive to western financial and business interests, i.e. the International Bank for Reconstruction and Development (IBRD), the Agency for International Development and Export and Import Bank of the U.S. government, Export Credits Guarantee Department (ECGD) of the United Kingdom Board of Trade and Volta Aluminium Company (VALCO) formed by Kaiser Aluminium and Chemical Corporation and Reynolds Metals Company in 1959.

Without this revision, which reduced its size and costs, this project would have constituted a great economic development in Ghana, because the project involved the development of power, smelter and bauxite mines, including their townships and public works, all of which meant a substantial capital and industrial development as well as a source of employment and national revenue. The reasons for this revision are accounted for in Chapter III, which deals with the implementation and financial costs of the VRP.
The origins of the VRP have been classified into international and national for two main reasons. First, the VRP was originally initiated by the Imperial Government of the United Kingdom as an aspect of that government's colonial development policy in Ghana in that period. But when the first African Colonial Administration under Nkrumah assumed office in the early 1950's in that country, the Nkrumah government incorporated this project into its economic policy and the project ever since remained the core of that policy. Thus, the considerable emphasis given to the international rather than national origins of this project in this chapter must be understood in those terms. Second, partly because of this, and partly because of differences in motives, concerns, aspirations, objectives, and so on, for this project on the part of both the Imperial and African governments, it is considered appropriate to make such distinction between the international and national levels in order to reflect those differences. Moreover, as at the international level there were various other interests whose involvement in this project at different times in the life of this project must be fully accounted for, such distinction is also necessary.

Moxon suggested that World War I and the Great Depression of the 1920's were some of the problems that made the implementation of this scheme not possible. He also said that the Guggisburg administration in colonial Ghana was already committed to the development of Takoradi Harbour, Achimota College and Korlebu Hospital, as well as widespread motor road construction programme for the movement of cocoa and so could not act upon the scheme when A.E. Kitson published his revised report in 1924. James Moxon, Volta, Man's Greatest Lake (New York: Praeger, 1969), pp. 50-51.

According to Moxon (ibid., p. 52), Duncan Rose is said to have been fired with the idea of a hydroelectric aluminium scheme in the Gold Coast by Kitson's proposals (Bulletin of 1925) which he (Rose) came across in the Public Library in Johannesburg in November, 1938.


According to the Report of the Preparatory Commission (HMSO) 1956, II, pp. 8-9 (Appendix I), the mid-1940's witnessed a sudden growth in demand for aluminium; whereas in the late 1920's and early 1930's the United Kingdom demand for virgin aluminium
was around 20,000 tons; in 1946 her consumption exceeded 200,000 tons; and had grown to 316,000 tons in 1951. In the 1950's, according to Thomas Balogh (a Fellow of Balliol College, Oxford University), the U.K.'s demand for aluminium was expected to be 60 per cent above the 1950 level and by 1975 more than three times the 1955 level. In 1955, 4/5 of the U.K.'s virgin aluminium was coming from dollar sources (West Africa, October, 1955, p. 963). In Balogh's view, there was vital and urgent need for a vast expansion of aluminium supplies in the sterling area since 1945.


7 Ibid., p. 7.

8 Ibid., p. 7.

9 Ibid., p. 10.

10 Ibid., p. 55.


16 West Africa, August 4, 1956, p. 569.

17 Ibid., p. 569.


21 Regarding the withdrawal of Alcan, no positive answer was obtained when I approached Alcan in 1978 with a questionnaire about their involvement in the Volta River Project. The following statement constitutes their response to the question of their withdrawal: "As to reasons for Alcan's withdrawal, I refer you to the enclosed paper mentioned above and to the other enclosed document headed 'Chapter I, brief History of the Volta River Project since 1956' which comes from 'The Volta River Project,' a statement by the Government of Ghana dated 20th February 1961". In their letter, which was dated December 18, 1978 and signed on behalf of Alcan Aluminium Limited by A.A. Bruneau, Secretary, Alcan also explained that a number of the Alcan people who were most involved in the VRP had retired and others did not remember the details, and so "some of the answers are not as complete as they might be."


24 James Moxon, op. cit., p. 89.


28 Ibid., p. 571.

29 "Letter of intent" implies the signing of principles of agreement between Volta Aluminium Company Limited (VALCO) and the Government of Ghana in 1959.

30 Excerpt, op. cit., p. 5.


33 R.B. Davison, op. cit. p. 55.

34 James Moxon, op. cit., p. 73.

35 Thomas A. Howell et al, op. cit., p. 15.

36 According to Nkrumah, "All industries of any major economic significance require, as a basic facility, a large and reliable source of power," Africa Must Unite (1963, p. 114) and that "the industrialization of Britain, America and Canada, Russia...emerged as a result of the discovery of new sources of energy" (Ibid., p. 144). This gives an insight into Nkrumah's concern for the development of the VRP with regard to the provision of power.
CHAPTER III

OBJECTIVES OF THE VRP

The objectives of this project are defined here as the project's primary and secondary goals relative to the motives, concerns, aspirations, interests, and so on, of various parties who were involved in the development of the project at different stages since its inception. The distinction between international and national objectives is made in order to give an appropriate weight to the relative importance of the involvement of the various interests toward the realization of this project.

International Objectives

United Kingdom (U.K.)

When the United Kingdom (U.K.) government became actively involved and very much interested in the VRP in the early 1950's, the government was concerned with two main things. First, the British government was concerned with finding an alternative source of aluminium for the British market; and second, the government was also concerned with the development of its colonial territory of Ghana, following the report and recommendation of the Watson Commission (Cf. origins).
The United Kingdom was interested in the project because its successful completion would have guaranteed supplies of aluminium at competitive prices. In return for its investment (47.1 per cent of the total cost) in the Volta scheme, the U.K. would have become a major market for the Gold Coast's aluminium ingots. For thirty years, not less than 75 per cent of the metal produced would have been sold to British consumers at a price competitive with North American prices.

With regard to the development of its colonial territory, the VRP would have politically fulfilled the colonial government's responsibility to that territory. The British government hoped the VRP would provide a sound economic base for Ghana. So it was a regional development programme, the biggest in the British West Africa at the time.

Britain, during the 1950's, had a direct responsibility as a colonial master for the economic development of colonial Ghana. In 1948, the Watson Commission had called the attention of the colonial administration to the economic situation of the colony and had suggested the implementation of the VRP as a step toward the colony's economic development. In 1956, as Ghana approached independence, the VRP, however, became the U.K.'s way of encouraging the development of resources in Ghana for the mutual benefits of Ghana and Britain.

In the 1960's, Britain's involvement in this project was largely political. Having failed to see through this project in the 1950's, she felt obliged as the former colonial master to help Ghana in any way possible with the implementation of the
project. More than this, Britain wanted to demonstrate her desire and willingness to assist in the development of the new Africa, especially commonwealth Africa.

The British Prime Minister, Harold Macmillan, is said to have persuaded President Kennedy in 1961 to go ahead with U.S. participation in the project when the U.S. government seemed reluctant to do so in the face of mounting adverse public opinion about Nkrumah in the administration and Congress.

**Aluminium Companies (Alcan and BACO)**

The aluminium companies (Alcan and BACO) became involved in the VRP largely for economic reasons. They saw in the development of this project an opportunity to expand their aluminium production for the U.K. market. As Alcan indicated in a questionnaire, the primary objective of the aluminium companies was "to obtain a good sterling area source of aluminium ingot for the U.K. market in which Alcan was well established both as a fabricator of aluminium sheet products and extrusion and as a supplier of ingot to third parties."¹

For this reason, the interest of the aluminium companies was largely economic and so their major concern was with profitability of the VRP venture. The availability of bauxite and a greater potential for hydroelectric power in the colonial Ghana would have made the development of an aluminium industry in that country more profitable than in North Borneo. Their investment would have helped Ghana to develop her resources of
water and bauxite for their mutual benefits. And it must be
stressed also that the involvement of the aluminium companies
was very vital because, without their participation, there
could hardly be an economically viable Volta scheme, since the
whole scheme was conceived as an integrated aluminium industry.
But because of the rising costs of this venture, in addition
to over-production of aluminium in the world market since the
mid-1950's, the companies were unwilling to participate in the
VRP as originally planned unless there was a revision of the
original terms of partnership. This could not be achieved
during negotiations.

The World Bank

The decision of the World Bank to participate in the VRP
was influenced by a political consideration. According to the
World Bank Reports of 1956 and 1960, the Volta Project was not
economically an attractive one. Yet it became clear in the
1960's that it was willing to participate in the venture. The
bank's impression from its 1956 study was that the government
saw the VRP as the best means of diversifying and strengthening
Ghana's economy. The bank realized that the VRP idea would
not be abandoned in Ghana, since it was an important element in
Ghana government's economic thinking. It was the objective
of the World Bank to assist Ghana to develop the power base of
her industrialization and to provide for this important public
utility. As a member of the World Bank and the first indepen-
dent black African nation, Ghana's request for a loan was politically appealing, if not economically so.

Volta Aluminium Company (VALCO)

In the 1960's, when VALCO took over from Alcan, it was the cheap power tariff, in addition to several other concessions including the use of imported aluminium, that made the project attractive to the company. But VALCO's involvement as a major power consumer rendered the project economical for Ghana. So it was mutually advantageous for Ghana and VALCO.

Like Alcan and BACO, VALCO participated in the VRP as a private business interest. Primarily, it was to provide a smelter that would consume a substantial amount of the VRP's power for a long period of time and thus provide for the project's economic viability. It was also anticipated that the smelter company would ultimately develop the local bauxite deposits, including the building of an alumina reduction plant for the production of alumina in Ghana to feed its smelter. However, there was no written commitment to this effect.

The participation of a smelter company in this project was fundamental to the project's implementation. This was made clear from the onset. Consequently, VALCO's involvement in the VRP made it appear complete as an economically viable scheme. Thus, the company's participation was crucial. Nonetheless, it must be stressed that it was partly because of cheap power and several concessions granted to this company, including tax
exemptions and the use of imported alumina for a period of ten years, that made this project economically attractive to VALCO.

The U.S. Government

The objective of the U.S. government in participating in the VRP was both political and economic. The U.S. government wanted to aid the Ghanaian government for wider political and economic reasons concerning the U.S.'s relations with Ghana and the whole of Africa.

In 1956, Senator M. Mansfield observed that there had been a call on the U.S. government to pursue a more active policy in Africa. According to Senator Mansfield, it was felt that the U.S. was neglecting Africa while Russia was trying to "twist Africa's awakening into totalitarian channels."²

In the same year, Mrs. Frances Bolton, a senior member of the House of Representatives' Foreign Affairs Committee, in a report on her three-month study mission to twenty-four countries and territories in Africa, urged the U.S. to make it clear to the African that: "We know his intense desire for freedom and sympathise with him."³ Mrs. Bolton recommended that the U.S. let it be known that when colonial territories had won their independence they, too, would be able to obtain U.S. aid.⁴

In March, 1957, while attending Ghana's independence celebrations, Vice-President Richard Nixon publicly stated that the U.S. was interested in Ghana and the rest of Africa. He explained that the U.S. believed that what happened in Ghana
could have a profound effect on what happened in the rest of Africa.  

The Prime Minister of Ghana, Kwame Nkrumah, made it known to the western world that his people expected political equality to bring economic equality. So there must be something to show for independence; otherwise popular discontent might split the country apart. He also stressed the fact that leaders of the new Africa had no alternative but to look for outside assistance. He pointed out:

> We have to modernize. Either we shall do so with the interest and support of the West or we shall be compelled to turn elsewhere. This is not a warning or a threat, but a straight statement of political reality.

The U.S. had two motives: to help Ghana develop economically, politically and socially, and to keep out the Russians. In sum, it can be said that the decision of the U.S. government to participate in the project in 1961 was largely influenced by regional political considerations. The U.S. put a premium on the political significance of Ghana's assumed leadership of the emerging African nations. The political interest of the U.S. became evident during the administration of President Dwight D. Eisenhower in the 1950's and President John F. Kennedy in the 1960's.

Nkrumah's request for U.S. government loans for the VRP development in 1958 was made at a time when the U.S. aluminium industry was faced with an over-production crisis and had sought U.S. government assistance in a stockpile move. But the U.S.
government under President Eisenhower offered to assist Ghana for political reasons. Vice-President Richard Nixon, while attending Ghana's independence celebrations in 1957 in Ghana, had stressed in public statements Ghana's importance to the U.S. in African regional politics. But by 1961, Ghana's non-alignment policy was considered dubious because, in the opinion of the U.S., it was not backed by concrete action.

The decision during President Kennedy's administration regarding whether or not to give Ghana the development loans she required was crucial to the U.S. for two reasons: refusing aid would have been to use aid as a political weapon; and a previous refusal by the U.S. to give Egypt a development loan (because of a dispute over the Aswan High Dam) led to that project's takeover by the Soviet Union.

National Objectives

Broadly, the VRP was to provide a sound economic base for the industrialization of Ghana with a view to raising the standard of living of Ghanaians. This project was to develop about 600,000 kilowatts of power from the Volta River cheaply enough to enable aluminium to be produced at an economic price from the great deposits of bauxite in Ghana. Out of 564,000 K.W. of electric power, 514,000 K.W. was to be available to the smelter,
which could then produce a maximum of 210,000 tons of aluminium a year. The remainder was to be available for other uses in Ghana. Ghana's reserves of workable bauxite, estimated to be over 200 million tons, would be sufficient to supply the smelter at its maximum planned rate of production for more than 200 years.

Public Works

The public works included the building of approximately 83 miles of railways to transport the bauxite and ingot, a new port to handle the flow of imports associated with the scheme, new roads to provide access to the main works, the resettlement of those displaced by the lake, and the building of new townships at the site of bauxite mines, the dam, and the smelter.

Quite apart from the exploitation of great mineral wealth and the harnessing of power essential to other industrial development, the erection of the dam would open possibilities of developing fishery and irrigation, which could transform agriculture over vast areas (especially the Accra and Afram Plains). An inland waterway would also be created between the Savannah of northern Ghana and Akosombo in the south in the Volta region. Furthermore, a series of ancilliary industries could be developed from these subsidiary benefits, such as tourism, boat-building and afforestation.

VRP's National Importance

The importance of this project lay in the government's
desire to diversify the economic base of the country so that its dependency on cocoa would be reduced. Jackson has noted that the main justification for the Volta scheme was to get Ghana away from dependence on a single crop, cocoa; and this, in his view, had become particularly urgent in view of the fall in the world price of cocoa.\textsuperscript{8}

Like most developing countries, Ghana was faced with some fundamental economic problems. She had been a primary producing country for several decades. A large proportion of her development funds came from cocoa export duty. Cocoa was virtually the "life blood" of the country's economy and was recognized as such.\textsuperscript{9} Ghana began to realize her economic weakness when she started to experience in the mid-1950's cocoa price fluctuations in the world market. The fragile nature of the country's economy and its dependence on cocoa as the mainstay of the country's economy made an early transformation of the country's economy not only desirable but imperative.

In March, 1957, Nkrumah told his fellow Ghanaians that his government was conscious of the "great and perhaps decisive contribution which the Volta Project would make to the diversification of the economy and to reducing our dependence on the basic cash crop, cocoa.\textsuperscript{10}

For Nkrumah, a diversified economy required industrialization. He saw the VRP as the country's hope for industrialization because it offered an energy source, which is a prerequisite for industrialization.

Another aspect of economic diversification was agricultural
modernization. This implied the use of scientific methods, including mechanization of farming. It was thought that the Accra and Afram Plains would provide good opportunities under the VRP to experiment with a large scale irrigation scheme.

Although Nkrumah identified development with industrialization and so tended to view agriculture as an inferior form of activity, he did not deny the desirability of raising agricultural productivity.\textsuperscript{11}

The basic national objective of the VRP, therefore, was to make available industrial energy for the purpose of industrialization, agriculture and social programmes. But it also had a political objective. It was to fulfill a political 'pledge' in Ghana to provide a "Programme of Work and Happiness." It was anticipated that the combined effect of this project would ensure a relatively equitable distribution of development across a large part of the country.

The VRP as an International Investment Opportunity

In addition, the Government of Ghana saw the VRP as an international investment. The desire to encourage foreign enterprise in the country for mutual benefits was an important aspect of the government's economic policy.

In his "Report on Industrialization and the Gold Coast" of 1953, Arthur Lewis recommended that the government of the Gold Coast should favour foreign enterprise because: "If the government were determined to exclude private foreign capital,
it would be better to postpone industrialization rather than to divert money to it from these more urgent purposes." He stressed that even if the money were available industrialization could not proceed without the knowledge of foreigners. He pointed out that:

In any country the early stages of industrialization are usually the work of foreigners because usually only they have the knowledge and the capital. This was true of the industrialization of Britain from the fifteenth century to the seventeenth, when the foundations of later greater were being laid, and, it is true of every modern country since that time, except the USSR. The USSR relied on foreigners for knowledge, but supplied the capital herself, by squeezing it out of her farmers. Japan used both foreign knowledge and capital; but the very unequal distribution of income in the country enabled her wealthy classes to supply a much greater proportion of the required capital than is possible in more egalitarian countries.

Lewis added that especially for something like the manufacture of aluminium there was no way of starting the industry without the full participation of foreign capital and enterprise. As an international investment, therefore, the government saw the VRP as a source of capital, market and industrial knowledge and experience which they considered vital elements in the process of industrialization.

In March, 1954, Nkrumah stated:

In formulating its policy the government has accepted the fact that it will be many years before the Gold Coast will be in a position to find from its own resources people who can combine capital with experience required in the development and management of new industries. It is, therefore, apparent that the Gold Coast must rely to a large extent on foreign enterprise and the government is anxious to give it every encouragement...this government proposes to encourage as much as possible the entry and investment in industry of foreign capital.
In 1957, Nkrumah again noted that Ghanaians' inability to succeed in commerce and industry was due to two chief factors: lack of industrial experience and shortage of indigenous capital. He felt only time and education were likely to cure this. Consequently, he believed that: "Whatever we do to increase African participation in industry and commerce and however wisely we do deploy our own resources, it is clear that for some time to come Ghana will require the investment of foreign capital." Therefore, in order to attract foreign capital after independence, Ghana decided to overhaul her law and fiscal policy generally because, as Nkrumah pointed out, "Foreign capital investment here should not be unduly penalised by the operation of a tax system which was devised under colonial conditions," and that "Ghanaian commercial law and her taxation arrangements must be those best suited to attract foreign investment." And while on a state visit to United States in August, 1958, Nkrumah told the U.S. Senate:

I do not come to the United States asking for direct financial aid. We need American investment - both government and private but only for projects which can stand on their own feet and ultimately repay the original capital with reasonable interest.

He also had no fear that foreign investment in Ghana could mean too much influence from abroad as, according to Nkrumah, his government had a clear policy of overseas investment. In the view of Nkrumah, certain industries could be best set up by foreign and private investment, others by the government, and some by the cooperation of both.

However, although Nkrumah favoured foreign investment, in
the 1960's he often stressed the fact that "Ghana welcomes for-
eign capital, institutional or private, provided it comes with-
out strings and with the sole purpose of helping to accelerate
economic development of Ghana, to the mutual benefits of the
investor and the country."\textsuperscript{22} Ghana's new attitude toward
foreign investment started in 1960, when she became a socialist
state. The government of Ghana stated that Ghana needed capi-
tal from abroad for her programmes of development, but she had
to make sure that there were no political implications involved
in economic or technical assistance. According to President
Nkrumah, Ghana might even have to borrow money. But "in all
our negotiations or agreements we must avoid economic imperial-
ism, or do anything that may compromise our political indepen-
dence," and that what Ghana wanted was "a genuine and unfettered
economic and technical co-partnership with friendly and freedom-
loving nations."\textsuperscript{23}

In the light of the above, the VRP can be understood not
only in its primary objective but also the overall development
policy of the government of Ghana. The VRP required foreign
participation because of the vast capital expenditure; it also
required foreign participation because the project could only be
justified economically if an aluminium smelter company was pre-
pared to buy power for a long period. And finally, it required
industrial experience and skill to develop and operate hydro-
electricity as well as an aluminium industry. On top of all
these, Nkrumah and his government recognized the fact that
investment capital is hard to come by in the world and that the
capital is, therefore, highly selective and tends to go where it is most welcome.

At the International Level

By the 1960's, the priority of the western participants had changed. They saw the project as an international co-operative venture aimed at helping Ghana develop her natural resource of water in order to meet her energy requirements. Politically, western involvement was seen in the context of regional security. The growing poverty in the Third World was seen as a threat to world peace because western countries, like the United States of America and the United Kingdom, felt that excessive poverty in the Third World could lead to a violent change, especially through the prompting of communist movement, which was gaining ascendancy in certain parts of the world. But the western assistance had its business element as well. The sums of money Ghana obtained for the Volta Project were given as loans. At the same time, through the Export and Import Bank, the U.S. government guaranteed VALCO a £46 million loan, which enabled VALCO to build the smelter.
At the National Level

It has been indicated that the development of the VRP at the national level originated with the colonial administration's attempt to implement this scheme in Ghana. While the British government saw the development of the VRP as an opportunity to obtain its aluminium supply from its own colonial territory and with the possibility of bringing about a measure of economic development in this colony through that project, the government of Ghana had a different view towards the VRP. The government of Ghana, under the CPP administration, was motivated by the desire to rapidly develop Ghana into a modern and industrial state with the VRP as the starting point. Because of the instability and weakness of Ghana's economy, the government saw diversification of Ghana's economy as an alternative route to Ghana's economic progress. Diversification implied industrialization and agricultural revolution in the sense of using scientific methods of farming and producing a variety of cash crops.

The need to share in western knowledge and experience came as a result of interdependence among nations brought about by the development of communications since the age of exploration. The west's ability to control development of resources and to stimulate the development of new forms of social and economic organizations led Ghana to desire to take advantage of the processes and techniques used, in the development of her natural resources of water and bauxite. In this regard, it can be said that Ghana's desire to employ, and attitude toward, the western
pattern of development was an element of international communication (in Lerner's sense).

**Domestic Objectives**

The government had two main objectives in the 1950's for the development of the VRP. The first was to build a strong and progressive society in which no one would be anxious about the basic requirements of life, food, shelter, health, education and work. Through the VRP the CPP administration would fulfill its promise of "Work and Happiness." Ghana's government also considered international development as a contribution to world peace and indispensable to Ghana's accelerated economic development, to which the government was committed and which the government considered the best way of breaking the "vicious circle" of Ghana's economic poverty.

Ghana, under Nkrumah was also committed to the use of her resources as far as possible for the pursuit of independence and the unity of Africa. Nkrumah saw the significance of the VRP as a means of strengthening the Ghanaian economy so that Ghana could effectively contribute to Africa's economic and political unification.  

The government believed that with the right techniques they could maximize the benefits of modern science and knowledge. Without a store of techniques and managerial knowledge, Ghana's industrial development was not possible. The encouragement given to foreign investment was not merely for the purposes of
widening the Ghanaian industrial base, but also changing Ghanaian skills and techniques. This shows the faith Nkrumah had in the western concept of development with regard to modernization as a prerequisite for industrial development.

Ghana government's desire for aid was economic, but it had political undertones. The government saw foreign investment as a source of capital, industrial knowledge and skill. However, because the government did not want to be ideologically attached to either the west or the east, it favoured foreign participation in the VRP as a business partnership. This was to express the government's non-alignment policy which implied Ghana's non-partisanship in ideological struggle between the communist and capitalist systems. It also enabled Ghana to benefit from both sides in her own interest and in the interest of world peace. Nkrumah saw the VRP as "an example of the way in which careful and proper planning, together with foreign investment, public control and participation, and the devoted labour of the people (Ghanaians), can revolutionize the economic base of society" (Ghanaian society).

Domestically, Ghana's economic poverty was seen by the government as a threat to political stability. This view was commonly shared by countries like the United States of America and the United Kingdom, who saw poverty in the Third World countries as a threat to world peace.

From the above, therefore, it can be concluded that all the parties involved in the development of the VRP at both the
international and national levels at different times saw the project differently in regard to their motives and objectives. But they were united by the common desire of developing the VRP for their own mutual benefits.
NOTES

1 Aluminium Limited of Canada (Alcan), questionnaire sent by author, December, 1978.


3 Ibid., p. 73.

4 Ibid., p. 73.

5 Ibid., p. 73.


7 Ibid., p. 53.


9 In his 1956 Budget Speech to the National Assembly, K.A. Ghedemah, Ghana's Finance Minister, reminded members of the "fragile nature" of the country's economy in depending entirely on cocoa. He also admitted the fact that "cocoa is the life blood of our country," "Ghana's Second Budget," *West Africa*, September 1, 1956, p. 655.

10 *Daily Graphic*, March 6, 1957, p. 2.


13 Ibid., p. 8.

14 Ibid., p. 9.


17 Ibid., p. 9.

18 Ibid., p. 9.

19 *Bulletin, Department of State*, August 18, 1958, p. 284.


21 Ibid., p. 73.


24 Kwame Nkrumah, Speech by Osagyefo on Launching the Seven-Year Development Plan, Wednesday, March 11, 1964 (at the National Assembly in Accra, Ghana), p. xvi.

25 Ibid., p. xvi.
CHAPTER IV

IMPLEMENTATION AND COST OF THE VRP

Implementation of the VRP

The method of implementation refers to the main courses of action to bring this project to completion. Three main courses of action were considered necessary: (1) the investigation of the project to determine its feasibility relating to financial cost, engineering and economic soundness, ecological and socio-logical implications, and so forth; (2) negotiations for external loans and partnerships; and finally (3) the establishment of an authority to plan and execute the construction of the project as well as its related subconcerns. In addition to these measures, certain political actions were required to ensure that the project was adequately publicized.

Three main steps were taken in order to implement the VRP. These include feasibility studies, negotiations and reappraisal studies, and finally, administration and construction of the project, including resettlement and an agriculture scheme for the inhabitants in the Volta Basin who would be affected by the project.
Feasibility Studies

Private and public interests conducted a series of investigations between 1939 and 1951 to determine the economic and engineering feasibility of the project. And as explained earlier, the various reports indicated that the VRP was technically sound and economically viable.

Nonetheless, in 1952, changes in the world market prices of materials vital for the construction of the project made it necessary for the 1951 cost estimates of the project to be revised. In addition, being concerned about the immediate effect of the project on the inhabitants of the project area, the government of Ghana found it necessary to investigate the social aspects of the VRP, since these had not been taken into account in the previous studies. Furthermore, all the parties (the governments of Ghana and the United Kingdom and the aluminium companies) were concerned about the constitutional powers of the Volta River Authority as well as the preparation of the final agreement regarding this project.

Meanwhile, the 1952 British White Paper on the VRP had been produced. It conceived of the VRP as an integrated and comprehensive aluminium scheme consisting of the development of power, smelter and mines, and public works. The dam, power house, and health and resettlement measures were to be jointly financed; the smelter and mines were to be financed and operated as public services. The power would be sold at cost price. And the revenue to be derived by the government of Ghana would come
mainly from the sale of power, equity capital, taxation, charges for the use of public utilities such as railways and port facilities, and rent from the permanent housing to have been provided at the smelter, the dam and the townships.

However, those reasons led to the formation in 1953 of the Preparatory Commission, to which references have already been made. The work and report of the Preparatory Commission became the basis for negotiations in 1956. But because of the substantial increase in the estimates and capital cost of the project as reported by the Preparatory Commission in 1956, the governments of Ghana and the United Kingdom and the aluminium companies decided that the 1952 framework and methods of financing the project should be reviewed.

Apart from a World Bank's VRP preliminary investigation in 1956, no further action was taken on this project. But Ghana was due to become a sovereign state in March 1957, and it was anticipated that after that time Ghana would renew action on this project.

**Negotiations and Reappraisal Studies**

In 1957 an independent Ghana, under Nkrumah and his government, was determined to see through the Volta River Project. Throughout 1957, correspondence and negotiations continued with Messrs. Aluminium Limited of Canada (Alcan). But as previously stated, because of the large sums of money involved and difficulties in international financing and so on, negotiations remained
unfruitful.

In March 1958, Alcan told the government of Ghana that under the existing conditions they were not in a position to immediately proceed with the scheme and would be willing if necessary to negotiate a surrender of their bauxite and other rights on reasonable terms with any serious interested parties. This paved the way for Ghana's government to open negotiations with possible United States interests.

In 1958, following talks between the governments of the United States and Ghana and by their request, Kaiser Engineers and Contractors reappraised the VRP's engineering aspects and their financial costs. In its report of February 1959, Kaiser made some changes in the original VRP plan.

First, a new site for the dam was selected at Akosombo. This was considered to be more difficult to construct than the one proposed at Ajena, but it was estimated that it could be built in four years instead of the seven years originally estimated. In addition to the 883,000 kilowatts (K.W.) that could be generated at Akosombo, the engineers stated that a further 140,000 K.W. could be developed as a second stage at Kpong. And finally, an additional 93,000 K.W. would be available at Bui.

Second, the aluminium smelter would be built at Tema, and not at Kpong, thus depriving Ghana the building of a smelter township that could hold some 50,000 people.

Third, for an initial period of ten years it was recommended that aluminium be imported instead of processing local bauxite. This would lead to the postponement of the development of new
mines, the construction of new railways and the building of an alumina reduction plant.

Fourth, it was recommended that an extensive electricity grid system should be installed in the major part of southern Ghana, extending from Tema to Accra, Cape Coast, Takoradi, Tarkwa, Dunkwa, Kumasi, Koforidua and back to Akosombo (See Fig. 4). Each of the first three steps was designed to keep the initial capital costs of the project to a minimum. It also represented part of a deliberate strategy to get the scheme started with the possibility of expansion later.\(^4\)

There were other changes in the plan as well. Under the revised VRP plan the government of Ghana would assume the entire transmission and substations, as well as health and resettlement measures associated with the project. The power would be sold at an economic rate rather than at cost. And finally, the purely commercial operation of mining bauxite, processing it into alumina, and smelting the alumina into ingot, should be financed and managed by private enterprise without any commitment as to the sale of metal.\(^5\)

(i) Reappraisal Studies

In addition to Kaiser's reappraisal study, there were still further reappraisal studies. In December 1959, and in March 1960, upon the request of the government of Ghana, the World Bank reappraised the VRP as revised by Kaiser, from financial, economic and technical points of view. In their report of July
Figure 4

1960, the Bank indicated that the project was sound from an engineering point of view but less attractive from an economic point of view.

(ii) Actions Taken

Before Nkrumah could secure agreement about the new aluminium company or know the prospects for international finance for the project as a whole, he had to take certain measures toward the implementation of the VRP. In 1959 the government of Ghana let contracts for the competition for the highway from Tema to Akosombo, for the provision of access roads to the dam site, and for the construction of a considerable amount of housing for supervising staff and workers. In April, 1960, Nkrumah called for tenders for the construction of the dam and power installation. In May, 1960, tenders were also called for, and within a year the contracts for the main works were awarded to the Italian Impregilo. Finally, tenders for the supply of equipment for transmission lines were called for early in 1961 and awarded in December of that year. Jackson further points out that by these actions Nkrumah demonstrated practically his absolute determination to bring the project to life. But it was not until the World Bank's reappraisal reports of 1959 and 1960 came out that the government of Ghana started negotiations for financial support from western sources in Washington. 6

As a result of talks with the government of the United States and the World Bank after the publication of the World
Bank's report in 1960, the Government of Ghana officially announced in August 1961 that Ghana had received firm assurances from the United States, Britain and the World Bank for loans totalling $84 million for the Volta River Project. The loans were to be given on condition that Ghana would come to terms with VALCO, which hoped to build an aluminium smelter as part of the project. Ghana would match from her own sources a World Bank loan of $40 million, a U.S. loan of $30 million and a British loan of $14 million, for a total of $84 million.7

(iii) Stresses and Strains of International Politics and Financial Interests

However, the Volta Project negotiations were overburdened not only with investigations and reappraisal studies, but also with stresses and strains of international politics and financial interests. Certain events raised questions about the Volta Project at just the moment when the agreement for the financing of the VRP had reached the point of signature.8 Nkrumah went on an extensive tour of the USSR, other east European countries and the People's Republic of China in July and August of 1961. From the statement he made, it seemed to the west, especially to the U.S., that he was moving further from a position of non-alignment and positive-neutrality.9

In Moscow, Nkrumah and Soviet President Leonid J. Brezhnev issued a joint communiqué expressing full identity of views on
major international problems. Nkrumah also conferred with Soviet leaders on further development of trade between the two countries and on economic and technical cooperation. In Warsaw he was lauded for the part he played in the 'Struggle of the African nations against colonialism.' And in Peking, Nkrumah said that Ghana supported the demand of the Chinese People's Republic for admission to the United Nations. He also signed a treaty of friendship between China and Ghana and agreements on economic and technical cooperation, trade and cultural cooperation.

Nkrumah's position on the Congo crisis was at variance with the west, and internal political repression in the early 1960's won the west's disapproval. The Takoradi-Sekondi railway and harbour strike in 1961, as well as the several attempts to subvert his government, were symptomatic of the problems of the time. In 1960, it was alleged that Ghana was contemplating nationalizing foreign business concerns in Ghana. Although this was promptly denied by Ghana's Finance Minister, Mr. K.A. Gbedemah, the U.S. State Department, which claimed that they had no evidence that could confirm this report of Ghana's plan to nationalize foreign firms, would not deny that such a move might be contemplated.

However, this should have seemed unlikely in view of the fact that in October, 1957, in an interview with Kingsley Martin of the New Statesman, Nkrumah said that he would have chosen a method other than the one Nasser chose to deal with the problem of the Suez when he was questioned about this.
In light of the fact that Ghana was not providing sterling examples either of liberalism at home or non-alignment in the world, President Kennedy wondered whether it was appropriate to invest a large share of U.S. funds set aside for Africa in a single project and in a single country. 16

To add to the problem, public opinion became critical of Nkrumah's external and internal policies and this affected the proposed Volta Project's financing by the United States. As Schlesinger has pointed out, Robert Kennedy was opposed to the aid; Adlai Stevenson also suggested that aid to the project be suspended. Only Abram Chayes, Chester Bowles and Mennen Williams, all at the State Department, were solidly in favour of this aid. 17

United States Congress was increasingly unhappy. Albert Gore, Chairman of the Senate Sub-Committee on African Affairs, was hostile to American support for the dam. He supported the theory that Ghana's policies were firmly oriented toward the Soviet Union and Communist China. 18

This was, incidentally, the time when Congress was debating U.S. foreign aid policy in general. Bruce Alger told the House of Representatives in August, 1961:

Let us gird ourselves and not give a penny to any government that does not guarantee its people certain freedoms, freedom of election, freedom of press, freedom of speech, freedom of religion. We must make this agonizing reappraisal - to stop subsidizing an alien philosophy. Let us say that we will aid only dedicated friends, not our enemies, not neutrals.19
Again, Christian A. Herter, the U.S. Secretary of State, in a press interview, had described Nkrumah's U.N. General Assembly Speech as "making a bid for the leadership of what you would call a Left-Wing group of African States," and that by his speech Nkrumah had "marked himself as very definitely leaning toward the Soviet Bloc."

Because of Nkrumah's alleged growing fascination with the eastern bloc and the belief that Nkrumah was only paying lip service to Ghana's declared policy of political non-alignment, Kennedy was under considerable pressure not to ratify the financial agreements entered into by his predecessor.

On the other hand, Kaiser and Calhoun, whom President Kennedy sent to Accra in October, 1961 for tough talks with Nkrumah, returned with cordial assurances that Ghana would stay on a course of true neutrality. In addition, a circular inquiry to other U.S. African embassies showed that most African governments, including some of Nkrumah's so-called political enemies, hoped the U.S. would go ahead. President Kennedy then sent a special mission to Ghana, headed by Clarence Randall, a "steel magnate reputed to be highly conservative," and Abram Chayes to tell more home truths to Nkrumah and to provide political cover for a decision to proceed with the project.

At the same time, Prime Minister Harold Macmillan wrote Kennedy in November, 1961 that he did not believe Nkrumah had yet gone "over to the Russians" but that if the United States was to pull out, the Africans would regard it as an attempt to use financial power to dictate the national policy of independent
African states. In his view, the Russians would move in; thus cancellation might have the same consequences in West Africa as Dulles' repudiation of the Aswan High Dam in Egypt in 1956 (during the Suez crisis). But, if the west backed the Volta Dam, it would be convincing proof to the Africans, who tended to regard the Soviet system as peculiarly efficacious for bringing about industrialization, that industrial development could be combined with freedom.

However, in December 1961, it was finally announced simultaneously in Washington and Accra that the U.S. would participate in the project. In this announcement it was also stated that the U.S. government would make loans totalling $133 million for the project and would help finance VALCO, the American-led consortium of private companies that had planned to build an aluminium smelter at Tema. And on January 22, 1962, the formal agreement was signed in Accra between President Nkrumah and Mr. Kaiser.

(iv) Disagreement over the Pricing of the Power

Before this great day the price for a unit of electricity became another issue between the government of Ghana and VALCO. VALCO had offered to pay 1/4d per unit of electricity (4.5 mills) but upon the suggestion of the World Bank, the government of Ghana was negotiating for a guaranteed rate of 1/2d per unit (4.5 mills) with a flat rate of 1½d per unit (15 mills) for all other consumers. The government was hoping to drop as low as 1/3d per unit (3.5 mills), but VALCO would only settle
for 1/4d per unit.  

The significance of this pricing was due to the fact that the World Bank was willing to loan up to $30 million, half of the estimated cost of the project and the largest loan in its history, subject to certain demanding conditions, including a satisfactory power rate. This therefore became another financial problem for negotiations. After a long letter to Nkrumah from Kaiser, the government of Ghana accepted the rate of 2.625 (1/4d) per unit, subject to the conclusion of satisfactory financing arrangements with the U.S. government and the World Bank. The government of Ghana then announced in November, 1961 that full agreement had been reached between the government and VALCO.

Administration and Construction of the VRP

Administrative and political measures toward implementing the project were started in the 1950's. The first step in this field was the formation of a national committee on the VRP in 1953. The reasons for setting up this committee and its functions, have been explained elsewhere. As a next step, in 1955 the national committee toured aluminium projects and power installations in Great Britain and Canada in order to help the Gold Coast leaders better understand the project. The visit enabled the Gold Coast delegation to get the Volta Scheme into "perspective," and give them an idea of what was involved in such an engineering feat. It also afforded them a chance to
see huge power stations in operation and aluminium smelters in action. In 1955, a campaign was planned to explain the VRP to Ghanaians. A mobile travelling exhibition, using models, dioramas, maps, photographs, diagrams, films, posters and captions in seven Ghanaian languages, explained what the project was intended to achieve for Ghanaians. This was done by two overseas experts (a journalist and a photographer) who were also to feed the newspaper with articles and pictures regarding the project. In addition, a booklet was produced in English and the main Gold Coast vernaculars outlining the proposals regarding the Volta scheme.

(i) The Creation of Volta River Authority

In the 1960's, the first administrative measure to be taken by the Government of Ghana was to create the Volta River Authority (VRA). In April 1961, Parliament of the Republic of Ghana passed the Volta River Development Act (Act 46), which established the Volta River Authority as a statutory corporation with Dr. Nkrumah as chairman and six board members. This board of six included representatives of the Volta Aluminium Company (VALCO) and the Ghana Electricity Corporation (GEC). It also had an expatriate Chief Executive as required by the VRP's agreement; Frank Dobson, a Canadian engineer was appointed in January, 1962 as VRA's first Chief Executive.

(ii) The Role of the VRA

The prime responsibility of the VRA was to plan,
execute and manage the development of the Volta River, including the construction and operation of the dam, power station and transportation system. It was also responsible for developing the 3,275 square mile lake for fishing, for a transport and communication system, and for promoting the health and welfare of the people in the lake area. In addition, the Authority was responsible for the resettlement of, and agriculture scheme for, the displaced people. And finally, it was also entrusted with the development of irrigation on the Accra Plains.

(iii) The Construction of the Power Project

The next major and final step in the implementation of this project was the construction of the power project which was started in January, 1952 and completed in September, 1965. In the meantime, the first parliament of the Republic of Ghana, on January 22, 1962, approved the "Master Agreement" between Ghana and VALCO; it was signed shortly afterward by Nkrumah on behalf of Ghana and by Mr. Kaiser of Kaiser Industries Corporation for VALCO.

Originally scheduled for seven years, the building of the power project was reduced to four years when the project was revised. The project was constructed in four main stages and under a tight schedule. The first stage was the dredging (removing of vast quantities of sand from a rocky river bed) of the Volta River at the dam spot. This was completed in April, 1962. The dredging was followed by the building of two coffer dams across the river from one bank to the other, while the draining
of all the water between the two coffer dams in order to finally and completely fill the space between them with clay was completed in March, 1963. The filling of the space between the two coffer dams completed the foundation for the dam in June, 1963. By September, 1965 the dam and the power project was officially inaugurated. As required by the agreement between VALCO and Ghana, a notice of a permanent delivery date was served to VALCO and became effective in April, 1967.

(iv) Resettlement and Agriculture Scheme

Closely associated with the construction of the power project was the resettlement and agriculture scheme for about 80,000 people, who would be displaced by the formation of the lake. To provide for their resettlement, in its report of 1956 the Preparatory Commission of the Volta River Project suggested "self-help" as the governing principle in a resettlement policy.

The principle of self-help implied that the settlers should build their own homes with such technical and material assistance as might be needed. The resettlement scheme included re-establishment of public amenities, road links and simple village layouts. The commission's recommendation was based on the conception that the spirit of self-help was essential for the successful creation of new communities and that this would be lost if the government opted to resettle the people instead of allowing them to settle by themselves. The policy of self-help would also prevent the settlers from depending on the
government to do everything for them. It was further pointed out that "it would be a very expensive policy and one which might prove impossible entirely to implement,"\textsuperscript{41} should the government resettle them. And in addition, according to the commission, "centralized planning might fail to make sufficient allowance for the existing differences in local customs, in general housing standards and in range of incomes within particular communities."\textsuperscript{42}

But the Government of Ghana was concerned about the welfare of the communities in the area to be affected by the project. To allay natural fears of what might happen to them, it had stated that "nobody would have to be worse off by reason of the introduction of the project."\textsuperscript{43} Thus, the government's declared aim was that none should be worse off as a result of the project and that the new conditions should be as good as, if not better than, before. In a sessional address to the parliament in 1964, Nkrumah reiterated his government's policy towards the resettlement scheme:

The aim of the resettlement scheme is to make the new townships viable communities by providing them with essential amenities like water supply, public conveniences, markets, schools, streets, access roads and drains.\textsuperscript{44}

The government's desire to improve the living conditions of the resettlers was politically motivated. Although by far the largest, the Volta Project resettlement scheme was not the first in Ghana. Various other projects involving the use of large areas of land for industrial and commercial enterprise had re-
settlement schemes attached to them. For example, the Tema Harbour and Township Development Scheme involved the removal of a fairly large fishing and sizeable ancient agricultural township.45

This scheme involved the provision of housing, areas for farming and new landing places for their fishing industry. They were provided with a modern fishing harbour suitable for their use and improved houses, with room for expansion. So there was a political precedence for the resettlement scheme.

In addition, the government wanted to use the resettlement scheme to introduce planned methods of agriculture to serve as a pattern for the rest of the country. It was envisaged that the resettlement in these townships and farms should "promote healthier living and scientific mixed agriculture."

The resettlement scheme was started in May, 1962. Initially some 2,000 people from 22 villages were resettled in October of that year. In September, 1963, 10,000 people from other affected communities were also resettled. By 1966, some 77,442 evacuees had been resettled in 52 resettlements. Up to 1966, the United Nations and Food and Agriculture Organization (UN/FAO) World Food Programme Aid Project distributed 6,162.2 metric tons of various food items to feed the evacuees during the period of resettlement.46 Compensation was paid to both resettlers and people from the riparian communities downstream of the Volta River.

The presence of the VRA was maintained through the establishment of Town Development Committees which were headed by
Town Managers and worked on community development, housing and administration, and the house completion programme for the settlements.  

Summary

The implementation of this project assumed economic, political, and administrative dimensions at all stages of development, from feasibility studies and negotiations to construction.

(i) Economic

Although by 1952 the reports of private and public investigations into the project had indicated the project was economically and technically sound, the parties wanted a more conclusive feasibility study, for economic and other reasons upon which a decision for further action was to be taken. As Sir Robert Jackson has observed, if the British and Gold Coast (Ghana) governments had decided in 1952 to go ahead with the project without detail planning, it would undoubtedly have been a success, because of the great increase in the world demand for aluminium (and consequently, for cheap power). But he also stressed that no government would have been prepared to take the political risks involved because, in his view, the disaster of the groundnut scheme, to which reference has already been made, in Tanganyika, dominated all thinking about great development schemes in the commonwealth.  

It was necessary to establish the Preparatory Commission in 1953, which investigated all aspects of this project, including legal, social and administra-
tive framework. It became the basis for the 1956 negotiations.

In 1956, negotiations between the aluminium companies and the governments of Gold Coast and the United Kingdom broke down because the aluminium companies wanted to be assured in advance of certain factors; for example, the cost of power. But this was not possible. By this time the cost of this project had risen and showed a tendency to rise again because this was a period of financial stringency when interest rates on loans and lengths of loan repayments were less favourable. In addition to this, the world demand for aluminium was temporarily outstripped by production capacity.

When Alcan ultimately withdrew from the VRP venture in 1958, it meant the project was no longer economically attractive to them. The company's withdrawal also made the project less attractive to the other parties, such as the U.K. and BACO, whose participation depended on a firm commitment by a smelter company, like Alcan, to use power.

The government of Ghana had to woo, persuade and encourage the western participation. It took a decade (from 1952 to 1962), during which feasibility and reappraisal studies and negotiations for financial and business participation were carried out, before the project took off the ground in 1962 and finished in 1966.

The appraisal study by Kaiser in 1958 and the World Bank's studies in 1959 and 1960, which reappraised Kaiser's reassessment report from economic and financial points of view, were all aimed at reviving the declining international interest in
the project due to its rising costs. Kaiser's reappraisal study revived the business interest in this project by making the development of the power project the sole responsibility of Ghana's government. The postponement of the construction of the alumina plant and working of the local bauxite for ten years also enhanced its economic attractiveness. These extensive changes deprived the project of several advantages; for example, the immediate development of Ghana's bauxite. But there were advantages such as cost reduction by over 40 per cent and an increase in power (from 564,000 to 768,000 kilowatts, 35 per cent).

In addition to accepting VALCO's demand for what was seen as one of the cheapest power tariffs in the world at the time, Ghana's government gave a written promise that the smelter would not be expropriated and added special exceptions for the company duties and taxes on imports and exports.49

(ii) Political

The establishment of the National Committee of the VRP in 1953 (advised by experts like Arthur Morgan and Arthur W. Lewis) at the national level was a purely political action. As already indicated, this was meant not only to safeguard the interest of the people but also to make this project a national issue. Moreover, its formation was the result of the criticisms mounted in the National Assembly about the VRP by both government backbenchers and members of the Opposition.

It is said recently that a CPP member of the National Assembly had suggested the VRP as conceived in the 1950's "might mean
economic enslavement," while, on the other hand, J.B. Darquah of the Opposition Party had repeated an earlier warning: "I said in 1943 and I say it again in 1953 — that the Volta Project is not for sale."^{50}

In spite of this political mood at the national level at that time in regard to the VRP, there was no public debate on this project in regard to its possible economic, political and social implications for Ghana at both local and national levels. The Ghanaian leadership appeared to be more concerned about the partnership arrangement for the VRP as an economic venture at the international level than seeking as well the ways and means to effectively utilize the benefits of this great project when it was ultimately implemented.

However, through travelling exhibitions in 1955 to key Ghanaian towns, the VRP development message was carried to the people. And in addition, a book produced in English and the main Ghanaian vernaculars explained to Ghanaians the VRP idea and its proposals for implementation. As Nkrumah stressed in its introduction, his government would not go ahead with the project until it had received a clear sign that the country as a whole wanted the project to be implemented. But under the existing system of communication - paternalistic and a one-way flow of information - one wonders as to how the Nkrumah government expected to get its public feedback in those days, in which public information was often couched in political and propaganda slogans. And under Nkrumah, this could be, and indeed was, excessive. Any such feedback was expected to be presumably
achieved through the mass media, which was largely limited to the urbanized Ghana.

Another attempt made by the government to create the impression that the National Committee for the VRP was well informed on the VRP's issue was the visit of the VRP national committee delegation to Canada and the United Kingdom in 1955, which gave them a chance to see huge power stations in operation and aluminium smelters in action. As a result of this visit, the Volta national committee were in the position to appreciate the implications of the VRP and able to advise the government on this scheme. As the head of the delegation, K.A. Gbedemah remarked after the visit that, while the details of the Canadian smelters at Kitimat and power station at Kemano, then under construction, were different from the VRP, the principles and the problems of the Canadian and Volta schemes were the same.

In 1953, in a VRP Legislative Assembly debate, members of the government and the Opposition criticized the project because it was being "rushed" and also because it was insufficiently contracted by Ghanaians.

At the international level, by August, 1961 Ghana had received firm assurances from the U.S., Britain and the World Bank for loans totalling $84 million for the VRP, provided Ghana was able to come to terms with VALCO for the construction of the smelter. But the U.S. government became reluctant to go ahead with the project for political reasons. Nkrumah's political repressions at home and pro-socialist pronouncements outside Ghana at that time incurred the displeasure of the
U.S. government. Consequently, a series of political investigations and diplomatic consultations were carried out before the U.S. government finally decided to participate in the project in December, 1961. To expect Ghana's government to behave in certain ways both at home and on the international scene in order to qualify for U.S. government development aid smacks of political imperialism, one might think. But we should also not forget that the U.S. involvement in the VRP was largely politically conditioned.

(iii) Administrative

At the construction stage, the Volta River Authority was established to manage the VRP; and the project was expected to be efficiently managed and legally insulated to ensure that international financial interests were secured. By agreement of the parties, the VRA had to use the services of an expatriate private accounting firm and an expatriate executive director was appointed at the initial stage for the VRA.

The construction of the dam and power station was tightly scheduled in order to ensure that the work was completed on time and so avoid extra expenses. The work was finished a year ahead of schedule, thus saving £10 million of the cost.

From the above, however, it can be seen that the implementation of this project assumed economic, political and administrative dimensions at all stages of development, from feasibility studies and negotiations to construction.
The term "cost" is used in two ways in this thesis. Primarily, "cost" is used to refer to the monetary cost; and secondarily, it refers to the intended and unintended adverse consequences of the project which are analyzed in the two following chapters.

There are several remarkable features about the Volta River Project. Rising costs is one such feature. Whereas in the 1940's it would have cost the West African Aluminium Limited (Wafal) £6.5 million to implement a modest but integrated aluminium industry in the Gold Coast, in 1951 the Joint Mission estimated the cost of its plan for the same scheme to be £37.5 million, including a 5 per cent allocation for annual running costs to produce 210,000 tons of aluminium per annum.

In 1952, when the British White Paper on the VRP was published, the cost was £144 million. By 1955 the revised estimates of the Preparatory Commission had brought the cost of the project to £231.2 million, to which were added allowances for inflation during the period of construction and for unforeseen engineering hazards. This brought the total to £309 million (See Tables I, II and III). And by the time that the interested parties met to consider the report of the Preparatory Commission in 1956, the estimated cost had risen by 7 per cent, bringing the estimate for the whole project up to £248 million. To this was added £11 million for working capital and certain
### TABLE I

**VOLTA RIVER PROJECT: 1952 COSTS ESTIMATES**

#### 1. 1952 Govt. White Paper Figures - Smelter Capacity

<table>
<thead>
<tr>
<th>Dam and power installation</th>
<th>£M 80,000</th>
<th>£M 120,000</th>
<th>£M 210,000</th>
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</thead>
<tbody>
<tr>
<td>Smelter and Mines</td>
<td>45.5</td>
<td>49.5</td>
<td>54.0</td>
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<tr>
<td>Gold Coast Government Public Works</td>
<td>26.0</td>
<td>26.0</td>
<td>26.0</td>
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<tr>
<td><strong>Total</strong></td>
<td>100.5</td>
<td>114.5</td>
<td>144.0</td>
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#### 2. 1955 Preparatory Commission's Estimate

<table>
<thead>
<tr>
<th>Dam and installation</th>
<th>£M 1955</th>
<th>£M 1955</th>
<th>£M 1955</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smelter and Mines</td>
<td>60.2</td>
<td>64.0</td>
<td>67.5</td>
</tr>
<tr>
<td>Gold Coast Govt. Public Works</td>
<td>59.3</td>
<td>63.0</td>
<td>72.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>162.6</td>
<td>184.9</td>
<td>231.2</td>
</tr>
</tbody>
</table>

#### 3. Estimate with 45% Added*

<table>
<thead>
<tr>
<th>Smelter Capacity</th>
<th>£M 80,000</th>
<th>£M 120,000</th>
<th>£M 210,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jointly Financed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Power Project</td>
<td>87</td>
<td>92</td>
<td>97</td>
</tr>
<tr>
<td>B. Smelter and Mines</td>
<td>62</td>
<td>84</td>
<td>132</td>
</tr>
<tr>
<td>C. Railways</td>
<td>23</td>
<td>24</td>
<td>26</td>
</tr>
<tr>
<td>Gold Coast Govt. Financed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Other direct Commitments</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>E. Other possible Investment arising from the project</td>
<td>2</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>F. Allied Development Expenditure</td>
<td>39</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>215</td>
<td>246</td>
<td>309</td>
</tr>
</tbody>
</table>


### TABLE II

**VOLTA RIVER PROJECT: 1955 COSTS ESTIMATES**

<table>
<thead>
<tr>
<th></th>
<th>Initial Stage</th>
<th>Intermediate Stage</th>
<th>Final Stage</th>
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</thead>
<tbody>
<tr>
<td><strong>Jointly Financed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dam and Power</td>
<td>£M</td>
<td>£M</td>
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<td>installation</td>
<td>60.2</td>
<td>64.0</td>
<td>67.5</td>
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<tr>
<td>Smelter and Mines</td>
<td>43.1</td>
<td>57.9</td>
<td>91.2</td>
</tr>
<tr>
<td><strong>Gold Coast Govt.</strong></td>
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</tr>
<tr>
<td><strong>Financed</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Railways</td>
<td>15.9</td>
<td>16.6</td>
<td>18.1</td>
</tr>
<tr>
<td>Other direct</td>
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<td>commitments</td>
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<tr>
<td>Other possible</td>
<td></td>
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</tr>
<tr>
<td>investment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>arising from</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>project</td>
<td>1.5</td>
<td>4.2</td>
<td>10.0</td>
</tr>
<tr>
<td>Allied development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expenditure</td>
<td>39.4</td>
<td>39.4</td>
<td>39.4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>59.3</td>
<td>63.0</td>
<td>72.5</td>
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</tbody>
</table>

**TOTAL**

<table>
<thead>
<tr>
<th></th>
<th>£M</th>
<th>£M</th>
<th>£M</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>162.6</td>
<td>184.9</td>
<td>231.2</td>
</tr>
</tbody>
</table>

**Note:** 1. The heading "Allied development expenditure" covers investment in port, road and town development which the Gold Coast Government has already decided to undertake for the general benefit of the country, irrespective of the decision on the Volta Project. The expenditure would therefore form part of the normal development programme of the Gold Coast, but is included in the above table since all the works concerned would be essential for the operation of the project.

**Note:** 2. All estimates are based on September 30, 1955 prices and make no allowance for rises during the construction period in wages or material costs. The addition of an extra margin is suggested later in Appendix XIII of the report, and adjusted estimates appear in paragraph 160 of same.

TABLE III
COMPARISON WITH THE WHITE PAPER, 1952 FIGURES AND THOSE OF 1955
WITH A 45% ADDED

<table>
<thead>
<tr>
<th>Stage of operation</th>
<th>Initial Stage</th>
<th>Intermediate Stage</th>
<th>Final Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>80,000 tons</td>
<td>120,000 tons</td>
<td>210,000 tons</td>
</tr>
<tr>
<td>Smelter Capacity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1952</td>
<td>1955</td>
<td>45% added</td>
<td>1952</td>
</tr>
<tr>
<td>Dam and Power Industry</td>
<td>45.5</td>
<td>87</td>
<td>49.5</td>
</tr>
<tr>
<td>Smelter and Mines</td>
<td>29.0</td>
<td>62</td>
<td>39.0</td>
</tr>
<tr>
<td>Gold Coast Govt.</td>
<td>26.0</td>
<td>23</td>
<td>26.0</td>
</tr>
<tr>
<td>Public Work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL*</td>
<td>100.5</td>
<td>162.6</td>
<td>172</td>
</tr>
</tbody>
</table>

Gold Coast Financed

| Expenditure           | 15.9         | 23                 | 16.6        | 24         | 18.1       | 26          |
| Railways              |              |                    |             |            |            |             |
| Other Direct commitment| 2.5          | 2                  | 2.8         | 3          | 5          | 5           |
| Other Possible Invest.| 1.5          | 2                  | 4.2         | 4          | 10.0       | 10          |
| Allied Development    | 39.4         | 39                 | 39.4        | 39         | 39.4       | 39          |
| Expenditure           |              |                    |             |            |            |             |
| TOTAL                 | 59.3         | 66                 | 53.0        | 70         | 68.0       | 80          |

*Note* (taken from text of source indicated below): The 1952 and 1955 estimates for Gold Coast Government expenditure do not cover identical fields, as if fully examined in paragraph 124 below (see p. 374 of Part II of the Report, Appendix XIII). For this reason, the figures in line 3 of the table cannot be exactly compared in the same way as those in lines 1 and 2. This is reflected in the total figures. It may be noted that if the amounts in Estimate Fare excluded from the total costs (on the grounds that they form part of the national development programme to which the Gold Coast is already committed) the totals for the three stages become £123 million, £146 million and £192 million respectively. P. 375 of Part II of the Report. Appendix XIII.

ancillary expenses. With further addition of a contingency allowance, the estimated total cost came to £325 million. In the 1950's, therefore, a rising cost of the Volta Project militated against the implementation of the project. Until 1959, when the rising cost was subdued by revising the original plan of the VRP, there appeared to be little or no hope of implementing the project. Ironically, however, the very revision that brought life into this project made it very different from its original conception. One could hardly speak of the Volta Project in its original sense, that is, as broadly defined in the Preparatory Commission's report of 1956. The final cost of the revised project was £70 million.

Factors that Influenced Cost

Many factors were responsible for the rising cost of this project. First, the project was a huge one. It consisted of a power project, smelter and mines, and extensive public works (mainly ancillary facilities).

(i) Power Project

For the power project, a large dam (370 feet high and 2,100 feet wide) was to be constructed at a cost in 1952 of £54 million. In 1955 the cost rose to £67.5 million, and with a 45 per cent allowance for unforeseen expenses, the cost came to £97 million. In 1961, the revised estimated cost of the power project was £61 million. Under the revised plans, when the dam and power house were completed in 1966, the cost came to £57.9 million.
(ii) **Aluminium Smelter and Mines**

The construction of aluminium smelter, alumina plant and the working of bauxite mines were estimated at £64 million in 1952. By 1955, their cost had risen to £132 million with contingency expenses, to £91.2 million without them. When the smelter was completed in 1967, excluding the cost of erecting the alumina plant and the working of the local mines, it cost £58.6 million. It had an initial production capacity of 100,000 tons, a 25 per cent increase over the original 80,000 tons. But the ultimate capacity was 130,000 tons of aluminium per year as compared to 210,000 tons, a decrease of 38 per cent.

(iii) **Public Works**

The public works covered the construction of railways, a port, access roads, and so on, to which reference has previously been made. Whereas in 1952 it would have cost £26 million to provide these facilities, in 1955 it rose to £72.5 million. Because of the revision of the project, which in turn affected the public works, the ultimate cost of the public works including the port and a township at Tema was over £30,000,000.

(iv) **Resettlement Scheme**

Another major commitment was the resettlement scheme, including the payment of compensation to about 80,000 evacuees. The estimated cost of £3.5 million as stated in the 1956 report of the Preparatory Commission rose to £9.5 million when the project was completed in 1966. The establishment of the Volta River Authority was charged to the cost of the power project.
It also cost over $2 million to cover expenses of the Preparatory Commission, investigations and consulting engineers.

(v) Period of Construction

The next factor was the lengthy period of construction. The power project was to be completed in seven years, five years for the erection of the dam and power installation, and two years for the filling of the lake. The minimum period for construction of other components was three years, and a maximum of four years was allowed for the development of the smelter and mines. In order to reduce the running costs, the project was to be developed and operated in three main stages with different production capacities of aluminium for each year (See Table I). In relation to costs, therefore, the time and size of the project became major constraints; the longer the construction period, the higher the prices for the vital raw material and the cost of labour and hence, the ultimate total cost of the project.

(vi) Other Factors

Nevertheless, several other factors led to the revision of this project toward the end of the 1950's. Reports indicated that there had been considerable expansion of aluminium production in both Canada and the United States. Alcan decided to postpone part of its aluminium expansion program in the mid-1950's because of the increasing difficulty in selling its output. In the U.S., the American aluminium companies asked the President to assist them in stockpiling due to an aluminium
trade cycle recession. This made Ghana's desire to increase the world aluminium production by the establishment of a new major industry economically unattractive. Shortly after Ghana's independence, when Nkrumah started pushing the project, he quickly came up against a blank wall - the leading manufacturers of aluminium. They were organized into a consortium controlling the bulk of the world's output, and were not interested in a new competitor, still less in a new source of cheap aluminium.53

Next, the prevalent rates of interest on long-term loans, which were increasing sharply as the duration of loans reduced. With each increase in the cost of money, the cost of power to be generated by the project rose also. Consequently, the rising cost led to the aluminium producers seeking to negotiate a long-term rate for power which, taken together with other factors, rendered the scheme as a whole uneconomic for some years to come. This made a new means of financing the project necessary. It also became desirable to reduce the heavy and rising costs of the scheme. Thus, a revision of the project seemed imperative.

When eventually the size of the project was reduced considerably, it led to a reduction in cost and in construction time. The cost of development and operation of the hydroelectric power was estimated at £70 million (70,642,000) of which £61,152,000 was to cover the cost of the construction of the dam and power house. The period of construction was reduced from 7 years to 4 years, and the development of the bauxite mines was postponed. These two changes brought the
cost down by nearly 30 per cent.

When the revised project was finished in 1966, the cost totalled £70 million, including the cost of transmission lines of some 500 miles (at approximately £9½ million) but excluding £35 million which the government of Ghana spent on allied projects such as a port, roads, and bridges, as well as £58.6 million which Volta Aluminium Company (VALCO) spent in the construction of an aluminium smelter at Tema.

Under the revised project the government had to borrow only £35 million from external sources (See Table IV) for the power project and to raise by itself £35 million in addition to the £35 million already spent for the building of ancillary facilities.
NOTES

1 The work of the Preparatory Commission from 1953 to 1956 also created a hiatus and again in the mid-1950's another hiatus was created due to protracted negotiations for international participation and financing of the VRP.

2 The 1953 Preparatory Commission's terms of reference were as follows:

(i) In conjunction with the Gold Coast Government to determine the phasing of the project with other Gold Coast government projects in the light of the available resources of the Gold Coast economy, including the adequacy of the government services;

(ii) To take part in the determination of the constitution and powers of Volta River Authority;

(iii) To continue the development of the necessary preparatory work with the assistance of such staff as the aluminium companies could make available and to employ such consultants as might be necessary for this purpose;


10 Ibid., p. 70.

11 Ibid., p. 70.


13 Ibid., p. 1.

14 Ibid., p. 1.


16 Arthur M. Schlesinger, Jr., op. cit., p. 572.

17 Ibid., p. 572.


21 Ibid., p. 10.

22 Arthur M. Schlesinger, Jr., op. cit., p. 572.

23 Ibid., p. 572.

24 Ibid., p. 572.

25 Ibid., p. 572.

26 Ibid., p. 572.
There is no evidence showing whether or not the Government of Ghana ever approached the Soviet Government with a request for economic assistance in the VRP. According to West Africa (May 14, 1960, p. 561), however, "Reports that the Russians have mentioned to the Ghana Parliamentary delegation in Moscow the possibility of a substantial loan at low interest towards the Volta Project are well founded." And again, according to the report of the U.S. Government's Study Mission to Africa, September-October, 1961, Report of Senators Albert Gore, Philip A. Hart and Mauriner B. Neuberger (U.S. Government Printing Office, Washington, January 14, 1962, p. 13), "It is doubtful if Ghana would have been as tempted to seek the Soviet aid as Egypt was in the case of Aswan, because of the absence of any utility of the project unless an aluminium smelter, with free world markets, were constructed to utilize the electricity. In any event, anti-American sentiment would have been fanned by our denial. The Soviet bloc would certainly have been invited in to fill part of the vacuum."

Ibid., p. 573.

Ibid., p. 573.


James Moxon, op. cit., p. 103.

Ibid., p. 103.

Ibid., p. 103.

West Africa, October 8, 1955, p. 958: The Volta Delegation visits Aluminium Smelters of Kitimat and the Power Station at Kemano."

Ibid., p. 958.

James Moxon, op. cit., p. 73.

Ibid., p. 73. Note that there is no evidence to suggest that the VRP received a critical evaluation from the Ghanaian public. According to Moxon, however, a purely African study circle known as the Focus Group, comprising a few young engineers, writers and sociologists excited at the opportunities the scheme offered Ghana, had prepared as a result of their discussions a searching pamphlet entitled "Power from Volta," balancing the social against the technical and economic points of view but divided about whether to publish it privately or present it officially to the government, they could not release it. (Ibid., p. 58)

39 Ibid., p. 17.


42 Ibid., p. 124.

43 Ibid., p. 130.


49 Keith Jopp, op. cit., p. 16.


52 Ibid., p. 129.

CHAPTER V

INTENDED CONSEQUENCES OF THE VRP

Intended consequences are defined as those consequences which were anticipated in terms of the primary and secondary objectives of the VRP, while unintended consequences are defined as those results which were not originally envisaged.

It was known that the harnessing of a river for the generation of hydroelectric power for social and economic development as was done in the Volta River Project would have diverse consequences, intended and unintended. In this chapter I will discuss the intended consequences of the VRP; the unintended consequences will be dealt with in the next chapter.

There were two main intended consequences. First, it was intended that the VRP would produce electricity which would make possible the production of aluminium and ultimately an aluminium industry based on locally processed alumina from Ghana's extensive bauxite; that it would promote industrialization in Ghana which would directly and indirectly create employment opportunities for many Ghanaians. The second intended consequence was that it would produce subsidiary benefits through the formation of the Volta Lake, such as possible irrigation for farming, a fishing industry, and inland water transportation. Because of these major consequences and the opportunities they would pro-
vide for further economic growth, the VRP was seen as a multi-purpose project. These major primary and secondary advantages will be dealt with under their specific headings.

1. **Electricity Supply**

The building of the Volta Dam has provided southern Ghana with a relatively cheap source of power, hydroelectric power for industrial, commercial, and domestic uses. In 1979, Akosombo Dam generated a maximum capacity of 599 MW of power for which, according to the design of the Akosombo power station it was intended to produce. Out of this amount of power, 315 MW was being used by VALCO, established purposely as the major consumer of the Akosombo power. Electricity Corporation of Ghana (ECG) was using 172 MW, mainly for domestic distribution.\(^2\) The mines and exportation of power to Togo and Benin received 40 and 26 megawatts respectively, while Akosombo Textile and Akosombo Township consumed the remaining 6 megawatts.\(^3\)

**Distribution of the Akosombo Power in Southern Ghana**

In spite of the availability of power in southern Ghana as a result of the VRP, distribution of electrical power in the southern Ghana has largely been limited so far to major industrial and commercial centres of the south such as Accra, Tema, Kumasi, Takoradi, Koforidua, Dunkwa and Cape Coast. A few other
tours, mostly mining and lumbering centres, like Tarkwa, Prestea, Obuasi, Nkawkaw and Samreboi also receive the Akosombo hydroelectric power. In 1978 only 20 to 22 per cent of the Ghanaian population had access to electricity supply. Consequently, a large section of the population, especially those in the rural areas, had no access to electricity supply.

The concentration of electricity supply in the urban and mining towns in southern Ghana can be explained in economic and social terms. To undertake an initially rural electrification programme is economically and socially difficult, especially in a developing country like Ghana. In terms of distribution, rural electrical loads are relatively sparse and in terms of revenue the rural sale of power is poor. But the capital outlay involved in the distribution is large. The economic and social considerations make the financing of rural electrification programming problematic. Nevertheless, this is no justification for the Government of Ghana to deny an optimum section of the people in southern Ghana an access to electricity supply. For political reasons, at least, the government is obliged to provide the rural people with electricity. And by doing so the government will also be translating into reality the political slogan used by the Nkrumah regime in the 1950's as a means of selling the VRP idea to both rural and urban people, the so-called "electricity for our industry and for lighting our villages and towns."

Apart from a plan in 1979 to construct a 161 KV transmission line to serve Volta-Achimota and terminal substation to supply
electricity to the Sefwi-Wiaso area in the western region, a comprehensive rural electrification has not been undertaken in the southern Ghana by the Government of Ghana. Although the VRP plan did not include a comprehensive electrification programme for southern Ghana, it was generally believed that the government would have its own plans for national electrification. The fact that this has not been done since the overthrow of the Nkrumah regime must be stressed.

2. Aluminium Industry

The provision of hydroelectricity in Ghana has made possible aluminium production. The economic justification for the VRP rested upon the development of a major power consuming industry, like aluminium production, which was expected to use more than half of the electricity produced each year. VALCO is thus now the major consuming company of the Akosombo electricity - it uses over half of the energy output. The company in 1979 expressed the desire for more energy. But VALCO's aluminium production is not presently based on locally processed bauxite as originally planned because the local bauxite has not yet been exploited. The future of the proposed aluminium industry in Ghana is still uncertain despite attempts made in recent years by both VALCO and the Government of Ghana to develop it.
3. **Industrialization of Ghana**

Ghana has had no known resources of coal or natural gas, and oil exploitation was only seriously started in 1978. Prior to the development of the Volta hydroelectricity in Ghana, there were three main sources of energy: the use of wood as fuel, thermal energy for industrial and other uses, and imported coal used by the national railways. Lack of a reliable and adequate supply of power was seen as a serious problem facing Ghana's industrial and commercial growth. Thus, the development of the VRP was intended to solve this problem, at least for a considerable period. It was hoped that the provision of power would enhance industrial and commercial expansion.

Electric power was seen as offering opportunity for the development of (1) a ferro-manganese industry; (2) a fertilizer industry, possibly in conjunction with the Republic of Togo, which has large deposits of potash and phosphates; (3) a soda plant for the production of both caustic soda and chloride; (4) lime deposits; and (5) iron ore mining, eventually including a steel manufacturing plant.

The development of most of these potential investment opportunities has not yet occurred, but attempts have been made by foreign business interests to start some of them. Marshall, for example, in 1976 noted that Krupp was involved in a plan to establish an iron industry in Ghana. And regarding the export of electricity, Togo and Benin became customers of the VRP in 1972, while the Ivory Coast is expected to purchase power to serve its northeastern areas when Bui
hydroelectric power is completed.

The Volta Project was also intended to serve the existing manufacturing, mining and timber industries, and existing commercial firms were expected to take advantage of the Volta hydro. By 1966, factories and industries (see Fig. 5) that could be regarded as the core of Ghana's industrial growth in the post-independence Ghana were already in operation. Nkrumah stated that not less than 63 state enterprises had been established in Ghana by February 1966. Others were under construction both in the public and private sectors, including a thousand rural industrial projects which, according to Nkrumah, were to be established throughout Ghana over a period of five years. These factories and industries were expected to make use of Volta's hydroelectricity.

But industrial expansion has generally been modest since 1966. O'Connor noted in 1978 that a few factories had been built in Takoradi and Kumasi and that distribution of industry within Ghana had changed little as a result of electrification as most are still found in Accra and Tema. Some of the most recent industrial establishments set up in the 1970's are Tata Brewery in Accra, Neoplan Bus Assembly in Kumasi and Iron and Steel foundry in Takoradi.

The modest industrial expansion in southern Ghana can be explained in a number of ways. First, politically, Ghana has not been stable for the past 13 years due to frequent military coups since the overthrow of Nkrumah. The frequent changes of government in Ghana also meant unpredictable economic
Key to Figure 5:

Accra - sawmills, furniture, brick & tiles, nails, tyre remoulding, soap, brewery, soft drinks, fruit canning, edible oil refinery, salt, garment making, food processing, shoe factory, rubber products, distillery, perfumery.

Tema - aluminium, steel, oil refinery, soap, cocoa factory, textiles, cement, vehicle assembly, chemicals & paints, furniture, electronics, plastics, tobacco, printing, food processing.

Sekondi-Takoradi - cigarettes & cigars, paper products, cocoa products, sawmills, plywood, tyre remoulding, boat buildings, furniture sawmills.

Kumasi - sawmills, furniture, biscuits, fibre bags, brewery, tyre remoulding.

Bolga Tanga - meat factory (corned beef)

Tarkwa - gold refinery, Akosombo textiles

Manso-Amenfi - bamboo products

Komenda - sugar refinery

Abkrampa - lime juice

Aboso - glass making

Elmina - salt

Kade - matches

Nsawam - fruits canning

Kofondina - lime and orange juice

Asiama - oil mills

Denu - oil mills

Akuse - sugar refinery

Samreboi - sawmills, plywood

Mim - sawmills
Ghana Industrial Establishments by 1966

Figure 5

policies and administrative measures. The changes brought by the different regimes affected the socio-economic conditions in Ghana. 17

The second factor which explains the slow industrialization in southern Ghana is Ghana's foreign exchange position (the purchasing power of Ghana export trade overseas). This has been weak since 1962 due to fluctuations in the price of cocoa on the world market. Because Ghana has been deriving 60 per cent of her overseas earnings through the sale of cocoa since the 1950's and up to the present time, slight fluctuations in the world market price of cocoa (adverse or favourable) mean a great deal. Ghana's development funds largely come from cocoa duties (export tax) received, so that the implications are immediately viewed.

Without external reserves, and faced with the problem of unstable export earnings, the public and private sectors of Ghanaian economy can hardly fulfill the programmes drawn for them. Since 1962, the Government of Ghana has had to rely on Ghana's meagre exports of cocoa, timber and minerals like gold, manganese and so forth, for foreign currency earnings.

The foreign exchange problem has also been compounded by big increases in central government budgets since 1959. 18 Since 1966, deficit financing and hence balance of payments deficits had remained a virtually permanent feature of both national budgetting and the Ghanaian economy. For instance, since 1972, the budget deficit has risen more than tenfold to over 2 billion cedis in 1977/78. 19 The effect of this big
government expenditure was a balance of payments deficit.

As a result of this weak foreign exchange position, the flow of industrial inputs consisting of raw materials, machinery, plant and equipment, spare parts, minerals, oil and gas as well as consumer goods was restricted through import licensing and exchange control. Foreign exchange restriction has had serious consequences for the industrial development envisaged by the VRP because they resulted in Ghana's inability to supply as much of the vital industrial inputs as required.

For instance, a 48 million cedis Iron and Steel Foundry built at Tokoradi in 1976 could not operate because the government was unable to grant a 41.5 million cedis import licence to the National Investment Bank (NIB). The money was needed for importation of major machinery required for its operation. And construction work was at a standstill from 1976 to 1979 because the NIB could not import the required machines. The import licence was finally granted to the NIB in August, 1979. And, according to a study on industrial growth in Ghana in 1978 by the European ABECOR group of banks:

A shortage of imported raw materials due to foreign exchange difficulties, and a lack of spare parts, resulted not only in existing industry operating at only 20% - 30% of capacity, but also acted as disincentive to the establishment of new industries, thus hampering export diversification and expansion.

Whatever the effects of Ghana's foreign exchange plight, Berg has suggested that the foreign exchange plight cannot be used as the only explanation for economic stagnation in Ghana,
because there are few countries that do not experience "shifting fortunes" in their external accounts; he pointed out that this is true of rich as well as poor, industrial as well as agricultural, countries. In his view, these changing fortunes require adaptations in economic policy, including, sometimes, temporary reduction in desired rate of economic expansion.

The third factor in explaining slow industrialization in Ghana is the political and state control of the economy. Ghana's economy is divided into four sectors: the state-owned sector; the joint state-private enterprise sector; the cooperative sector; and the purely private sector.

These four sectors have been the keys to development initiated by the VRP, although different governments since independence have emphasized different options within their general framework.

Ghana under the Nkrumah's government emphasized the participation of the state in the country's industrial development and so the state sector became a dominant factor in manufacturing, construction, agriculture and financial business as well as in transport, communication, and the provision of public services (infrastructure).

During the rule of the National Liberation Council (NLC) from 1966 to 1969, the private sector was seen as the dominant sector, open to both Ghanaian and non-Ghanaians. Finally, the NLC economic policy was further strengthened by the Busia government from 1969 to 1972, while the military regime of the
National Redemption Council (NRC) since 1972, in addition to reviving some of the Nkrumah economic policy, stressed Ghanaianization of the economy.  

In summary, the political and economic situations since 1966 created an unhealthy climate for industrial development, despite various attempts made by successive governments since the overthrow of the Nkrumah government to promote a healthy Ghanaian economy. Therefore, availability of electricity alone is not the determining factor for industrial growth in a country. And, in addition to the government's economic policy, there are other factors such as capital, technology, industrial knowledge and skill and market which will be relevant. Each of these will be considered in relation to the VRP.

Capital

Capital as used herein refers to financial capital - investible funds and human capital, consisting of industrial and commercial manpower, both in administrative and technical fields. Capital has been a major constraint on the development of the VRP's investment opportunities such as Ghana's aluminium industry, which was an integral part of the VRP. Because of lack of capital, the exploitation of Ghana's bauxite and the erection of alumina plant for the production of aluminium in Ghana have not occurred. The government of Ghana requires substantial money, partly in foreign exchange, as well as people with specialized knowledge and skill in the aluminium industry, in order to develop the bauxite mines and to provide ancillary facilities like access roads and railways, as well as
mining townships for the labour force. The need for an optimum supply of financial capital (investment capital), if and when it is possible, cannot be over-emphasized in the further development of the VRP.

In regard to human capital, a certain technological level in the industrial labour force and management cadre are required in order to meet the growing demand of industrial development in Ghana. Consequently, the need for industrial labour prompted the government to build technical, trade, and commercial institutions where people could be trained in different forms of industrial and commercial knowledge and skill. The Accra Technical Training Centre (ATTC) and Kumasi Trades Training Institute (KTTI), which the Canadian government through the Canadian International Development Corporation (CIDA) helped to build, are a case in point. In addition, facilities for further training in the technical institutes and Ghana universities have been expanded in recent years in order to cope with the increasing volume and a rising technological level of work. Further, in order to accommodate the education of the coming generation of Ghanaians to the technological requirements of the modern world, the teaching of basic scientific concepts and facts has been introduced into the Ghanaian elementary school programme.

Technology

Technology has always been a prominent requirement in the annals of industrial development. It became obvious that without an adequate supply of technology either in labour-intensive industry or capital-intensive industry, industrialization in
Ghana set in motion by the development of the VRP would be retarded.

Technology can be seen to include three main components: hard and softwares and technical skill (know-how). In Ghana, the use of any piece of technology since the inception of the VRP and after the completion of the project had often required the training of people in the skills of using and maintaining it; and an adequate supply of machinery and equipment had included an adequate supply of spare parts. Where the supply of either machinery and equipment or technical skill had been inadequate, the operation of an industry had been greatly retarded. For example, during the implementation of the VRP resettlement scheme, the use of machinery and equipment for the clearing of land for both resettlement townships and farmlands was held up because qualified people to handle the machinery and equipment were not readily available and so people had to be sent overseas for training for this purpose.27 Similarly, it has been indicated that (Cf. section under inland water transportation) the inland water transportation was faced with inadequate supplies of machinery and spare parts due to an insufficient allocation of foreign exchange.

Thus, it was anticipated that the VRP would open avenues for the training of indigenous administrative and technical manpower for industry and commerce in industrial Ghana. At any level of a country's industrial development, like that of Ghana, a certain level of technological skill is required for the application and servicing of the machinery and equipment involved, while different forms and levels of industrial technology and
skill as well as administrative and industrial manpower will be required. However, since the VRP's completion in 1966, because of political and economic problems, Ghana has failed to respond to real and potential demand for indigenous manpower in the various fields.

Industrial Knowledge and Skill

Industrial knowledge and skill can be achieved over a period of time in two main ways: (1) through a steady growth in indigenous business by both the public and private sectors, and (2) through partnership arrangement in which knowledge and experience can be acquired while working with people who are already experienced in the industrial field. For instance, the VRP aluminium industry was conceived in this way. Also, it is for this reason that the Government of Ghana has always encouraged private foreign investment in Ghana since the Nkrumah regime.

Market

Market is a necessary condition for industrial growth. Without market opportunity, no industry can exist in Ghana. The development of the VRP was possible because of a guaranteed market for the electricity. But in any line of production a real or potential market may grow or dwindle, depending upon particular circumstances. For instance, while in the early 1950's demand for aluminium in the world market was relatively high, by the late 1950's the aluminium industry was experiencing recession, making further expansion in the aluminium industry unattractive. Because of this, in addition to other factors, the aluminium industry in Ghana did not have much appeal.
4. Employment Opportunities Generated by the VRP

Directly and indirectly, the VRP has been a modest source of employment in that the development and operation of the power brought some people temporary, and other people permanent, employment. During the period of construction of the VRP about 4,200 persons were employed, of whom 3,500 were Ghanaians and 700 were overseas employees, a ratio of 5 to 1. Total employment during construction of the smelter was estimated to be 3,500; initially a labour force of 1,328 was required. Out of this (1,328), 1,250 were to be Ghanaians, 39 Americans and 39 others.

In the smelter's first year of operation in 1967, about 1,000 Ghanaians and 100 overseas personnel were employed. Of the 1,000 Ghanaians who were employed, about 500 worked directly on production, 250 on maintenance, while the rest worked on services, administration and engineering. The smelter offers openings for Ghanaian engineers, chemists and administrators and accountants at the professional level. Ten Ghanaian assistant engineers were employed in the beginning, out of a total engineering force of about 50. This is significant, given the experience and skill which had to be acquired and the fact that aluminium production is considered to be one of the most specialized industries in the world. Despite this, the degree of Ghanaianization in the operation and management of the smelter was crucial if Ghana is to benefit to any large extent from the aluminium industrial knowledge and experience. As an
The need for experience and skill cannot be over-emphasized; Ghana will require skilled manpower in the future for her aluminium industry. Besides, the acquisition of industrial knowledge and skill is one of the reasons for the promotion of private foreign business in Ghana. And, as required by the Master Agreement, VALCO has an obligation to train Ghanaians employed by the company at different levels of employment. However, whether or not this obligation is being complied with is not known, no information being available concerning this.

The Volta River Authority (VRA) and the VRP

Another source of employment is the VRA. The VRA had a working force of over 7,000 persons in 1964; in 1965 this working force declined to 2,000 persons, and by 1976 it had stabilized to slightly over 2,000 workers. The power station is now manned entirely by Canadian-trained Ghanaians. And the Electricity Corporation of Ghana (ECG), which distributes domestically the rest of the power in southern Ghana, employs several thousands of Ghanaians in its substations across southern Ghana. However, since the distribution of the Akosombo Power is limited to the cities and few towns in the south, only the privileged few urbanized Ghanaians will benefit from this employment, especially the technically qualified people. Finally, hundreds of Ghanaians worked in small projects like the construction of access roads, temporary houses for the
workers and permanent housing for social services (hospital, hotel, shopping centres, and so on) as well as the resettlement scheme and agriculture which, at peak pressure, employed over 16,500 persons (due to pressure of time). But this was only temporary employment.

On the other hand, Lake Volta's fishery offered a great and immediate opportunity for employment. Shortly after the formation of the Volta Lake, there was a sudden explosion in the fish population. According to Omo-Fadaka, some 120 single species of fish emerged, out of which 60 were found in commercial quantities and could be eaten. The fish boom meant employment for a large number of people, especially Tongu Ewe fishermen and women in the Volta Basin. The immediate effect of this fish boom was a rapid migration of fishermen from the Volta Delta region to the lake.

Before the formation of the lake, there were only 1,200 full-time fishermen along the Volta River, most of whom were Ewes from the Lower Volta. In 1964, Abhyankar observed that there were three main types of fishing available as an occupation: lake fishing, downstream clam and creek fishing. He estimated that 1,500 women specialized in clam fishing in the shallow riverbed during dry months. In addition, there were an estimated 400 privately-owned channels or creeks (fish-farms) on the downstream which provided good fishing grounds. In 1972, Vanderpuye estimated that there were 1,000 fishing villages scattered around the lake. And the number of full-time fishermen was found to be 25,000, working in 12,000 canoes.
According to Lawson, there are now some 2,000 fishing villages on the lakeshore and some 12,000 fishing canoes. 38

Although the Volta Lake fishery has provided many thousands of Ghanaians in the Volta Basin with permanent occupations, there are problems with the Volta Lake fishing industry. Lack of landing facilities presents a constraint on the marketing of fish. There are also no storage facilities and feeder roads are inadequate. Thus, the development of an infrastructure and landing and storage facilities for the lake fishery is still required. 39

So far, fishing activities on the lake have been financed entirely from the resources of private fishermen and entrepreneurs. 40 But since the formation of the Volta Lake Research Project in January 1968, investigations into the development and planning of the fishing industry, fishing biology, limnology and general biology have been conducted, partly with the support and funding of the Food and Agriculture Organization (FAO). Scientific studies are also made into practical methods of improving fishing gear, fish processing and marketing by the Volta River Authority (VRA). 41 The various studies indicate that the Volta Lake has a great potentiality for industrial fishing.

In 1969, Evans noted that, because of (1) the large size of Volta Lake, (2) the light fishing intensity per unit area, and (3) the intensive littoral zone which has a wide variety of fish fauna, some of which received only meagre utilization, over fishing is unlikely - at least, for a good number of years to
In the meantime, it should be pointed out that it was too early to make such a prediction, despite Evans' scientific reasoning. In 1976, however, an analysis of stock assessment study by a VRA study team, based on a sample of 18 stock assessment stations, indicated that catch per unit of effort was still high. A catch per 100 square feet of experimental gill-net and fished overnight ranged from 0.19 to 1.8 kilos, as compared with the highest catch of 1.1 kilos realized per station in the previous year (1975). And, according to the VRA's account, there was a continued upward trend in fish yield of Lake Volta. On the other hand, the VRA's 1976 Annual Report indicated that types of assistance given to fishermen by the VRA include technical advice to some districts and individuals in the Volta Basin who want to set up fishing industries. In addition, the VRA make and sell fishing boats and fishing nets to fishermen.

Finally, the establishment of fishing complex in 1976 by the VRA, consisting of a training school, boat-building yards, storage shelters, processing equipment and supply house on the Volta shore (at Kpandu-Tokor) is a notable development in the Volta Lake fishing industry in recent years. Intended to contribute towards the harnessing of the Volta Lake fish potential, the Kpandu-Tokor fishing complex, which also includes high level water ramps for berthing and moving facilities for waiting boats, has to be studied in terms of its contribution to the fishing industry before any judgement can be passed on this scheme. Since at the time of writing no such information
could be obtained about this scheme, which has been in existence for the past four years, and it has therefore not been possible to assess it as such. This notwithstanding, the setting-up of this complex is an indication of the fact that some effort has been made by the VRA to technically assist in the development of the fishing industry. While this move is desirable if the potentials of Lake Volta as a fishery resource are to be fully utilized to expand Ghana's domestic fish production to meet her outstanding demand for fish, it is yet to be seen to what extent the rural fishermen in the Volta Basin would benefit from the complex and what employment effects it will have.

In conclusion, we can see that the growth of industry and commerce through the VRP indirectly means some employment opportunity for many Ghanaians in towns and cities as well as rural areas of southern Ghana. In the cities and towns, most of the industries and factories involved in these enterprises use electrical power, of which Volta hydro is the main source.\textsuperscript{46} And the rapid growth of the township of Tema must be seen as a direct effect of industrial development in that part of Greater-Accra.\textsuperscript{47} Tema must also be seen as broadening the socio-economic base of an emerging "urban elite" in industrial Ghana since independence.
The Intended Secondary Effects of the VRP

As a result of the formation of Volta Lake, certain subsidiary benefits such as irrigation farming, fresh water fishing and inland water transportation were realized. These subsidiary benefits constituted the intended secondary effects of the VRP. These derived benefits were seen as important investment potentials. The development of these investment potentials will be discussed in some detail under their appropriate headings.

1. Irrigation Farming

In order to implement the Volta project irrigation farming, the government of Ghana under its Seven Year Development Plan of 1963/64-1969/70 planned to establish rice and sugar plantations on the Accra plains and in the Lower White Volta. The irrigation farming was to bring 270,000 acres of new land under irrigation schemes. A shoreline irrigation scheme to cover 7,000 acres of land in the Salaga area in the north was also part of the Volta Lake irrigation system. Together with other irrigation schemes in the country, the cost of the Volta Project irrigation schemes were estimated at £300,000.48

To implement its national irrigation farming policy, the government also set up an Irrigation Division of the Ministry of Agriculture in 1965. But with the suspension of the Seven Year Development Plan in 1966, this irrigation scheme, together
with the others, fell through.

The VRP's irrigation farming was an attempt to develop new crops like rice, cotton, and tobacco, in addition to vegetables, poultry and stock raising in certain areas, like the Accra Plains, where these were new but suitable under an irrigation system. It must be stressed that the VRP irrigation was seen as an important aspect of the Volta project because it was meant to expand or diversify agriculture in Ghana. But not much, if anything at all, has been accomplished from the VRP irrigation farming since it was started.

The first irrigation scheme in the Volta Basin was launched in 1964 at Asutsuare with technical assistance from the Food and Agriculture Organization (FAO). As a result of this scheme, Asutsuare now produces fine granulated sugar from its own irrigated sugar plantation. But the factory, together with the Komenda sugar estate and factory, has not made Ghana self-sufficient in her sugar needs. O'Connor noted in 1978 that the two sugar estates were experiencing technical and management problems.

However, despite its ambitious objective, irrigation on the Accra Plains since the formation of the Volta Lake has been on a modest and experimental basis, operating in selected villages. In Ampem, cowpeas, cotton, tomatoes have been grown experimentally, while in Asantekrom and Anyaase, maize and sweet potatoes, respectively, have been grown. Other crops on experimental irrigation cultivation include rice and ground nuts (peanuts).
The irrigation farming scheme has so far tended to be a relatively capital-intensive project because water pumps and pipes, tractors and fertilizers have been regularly used. In addition to providing access roads, and transportation for irrigation farming, the VRA had to train Ghanaians in how to handle tractors, and to maintain and repair them.53

It must be emphasized that the Volta Lake irrigation schemes, especially on the Accra Plains, have been largely on an experimental basis and that the project's ultimate success depends on several factors, such as capital, machinery, technical skill, and education in the modern methods and organization of irrigation farming. Irrigation farming is a relatively new system of farming in Ghana, and so, unlike the Sudan and Egypt, Ghana has no tradition of irrigation. But this does not mean that farming by irrigation system cannot succeed in Ghana. Rather, it suggests that the VRA must endeavour to utilize the opportunity offered by the Accra Plains and other areas in the Volta Basin for the expansion of Ghana's agricultural production through a more comprehensive irrigation farming. Large tracts of land suitable for both stockraising and poultry farming as well as for the cultivation of foodstuffs and industrial raw material the importation of which are now seen as a drain on the country's meagre foreign exchange earnings must be employed in a comprehensive and crash agriculture programme because of the country's present food shortage situation, especially in the northern part of Ghana in the late 1970's.
2. Fresh-water Fishing

Fishing is another economic benefit from the VRP. It is now an important source of income spread relatively widely among the thousands of Ghanaians. The inhabitants of the Volta Basin, especially, are engaged in fishing on a small scale and in smaller scale enterprises in the distribution and marketing of the fish. The fishing is also an important source of food for the population as a whole.

In 1956, the Preparatory Commission of the VRP estimated that with the formation of Volta Lake, fish production would be 18,000 tons per annum, which, according to Kwamina Barnes' calculation, was 58.06 per cent of Ghana's 1960 estimated catch from all the waters in the country and 38 per cent of Ghana's 1961 fish imports, which cost Ghana £4,814,000 in foreign exchange. Since the formation of the lake, studies done on the fishery resource indicate that the lake can be a dependable source of fresh-water fish for many years.

In 1972, Vanderpuye estimated the upper and lower limits of annual fish catch from the Volta Lake to be 40,000 (39,902) metric tons and 37,000 (37,250) metric tons, respectively. He also noted that the peak in abundance of commercial catch was reached in the rainy season of 1969. In another study, Bazigos estimated that the total fish caught for 1969 was 60,000 metric tons and in 1970 it was 40,000 metric tons. Larkin, however, has noted that the early stages of reservoir development are usually characterized by a high productivity
of fish, chiefly as a consequence of the injection of nutrients into the aquatic system by rapid bacterial decomposition and vigorous circulation. He pointed out in 1972 that "everyone expects the same sort of thing to happen at Africa's Lake Volta where fishermen have been enjoying a bonanza as catches increase from 4,000 to 60,000 tons per year over a five-year period." But it can be said that the Volta Lake has expanded Ghana's fresh-water fishing industry as a result of the VRP, as the following table indicates.

<table>
<thead>
<tr>
<th>Year</th>
<th>Metric Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1969/70</td>
<td>172,000</td>
</tr>
<tr>
<td>1971</td>
<td>281,000</td>
</tr>
<tr>
<td>1972</td>
<td>224,000</td>
</tr>
<tr>
<td>1973</td>
<td>220,000</td>
</tr>
<tr>
<td>1974</td>
<td>255,000</td>
</tr>
</tbody>
</table>

Source: Table 2. Fishery Production: World Catch of Aquatic Organism (Ghana), FAO Commodity and Outlook, 1976/77, p. 84.

The contribution by the Volta Lake fishing towards Ghana's domestic fish supply, although modest, was initially encouraging. In 1965, out of a total domestic catch of 80,029.4 metric tons, inland fishing accounted for 13,369.5 metric tons (16.7%). This was partly due to the formation of the lake in 1964. In 1964, importation of fish and fish products amounted
to 11,019.5 metric tons and was valued at £2,202.82. This was reduced to 5,802.8 metric tons, valued at £1,349,150 in 1965, being 47.3 per cent in tonnage of the previous or 58.6 per cent of the 1963 figure. In 1966 fresh-water fish amounted to 600 metric tons. By 1967 it had reached 3,000 metric tons (20% increase). It rose to 5,000 metric tons in 1968.

In 1974 Lawson noted that if the present level of fish catch is maintained, the lake's fisheries may provide some 20 to 25 per cent of Ghana's fish requirements, which are now estimated at 250,000 metric tons, while the country's total domestic production is estimated to be 190,000 metric tons. The difference is being met through imports, which consist mainly of sardine and mackerel.

However, the increase of food production through the development of an inland fishing industry [like the electricity supply], in the view of Forde, will better serve the interests of the southern sub-region [especially in the urban areas]. This is because of the lower transport costs in the distribution of the lake fishing and greater accessibility due to a more adequate road network. Indeed, in recent years a number of fish farms have been established in the Northern and Upper Regions where such farms, because of transportation problems in the supply of fish from the coast to the north, have become necessary. Nevertheless, the VRA's attempt to develop an integrated road and water transportation in the Volta Basin (Cf inland water transportation) is crucial to reduce this communication imbalance. Otherwise, a good section
of Ghana's population in the northern sub-region will be denied a full access to Ghana's domestic fish supply because of the lack of effective systems of transportation in that region.

In summary, it can be said that the VRP through its fishing industry has helped Ghana to expand her domestic fish supply. But in order to meet the great demand for fish in Ghana, every effort should be made to stimulate the growth of fish in the lake if the lake's fishery resource is not to be allowed to degenerate into a nine days' wonder and hence disenchantment for many thousands of people who now depend on the Volta Lake fishing for a living in the Volta Basin.

3. Inland Water Transportation

The development of inland water transportation is another subsidiary (derived) benefit from the Volta River Project. The inland waterway has provided an alternative route between southern and northern Ghana as well as arteries of communication within the Volta Basin. As a result of this, large quantities of foodstuffs, poultry, cattle and so on move from the north to the south and large quantities of petroleum, chemical and other consumer goods move from the south to the north, including a modest flow of passenger traffic since 1970. The inland waterway also provides the main link between the adjacent towns and villages along the lake.

Between 1970 and 1976, Volta Lake Transport Company (VLTC) transported a total cargo tonnage of over 122,000
with an average of 17,539.4 per year and 132,000 (132,404) passengers, with an annual average of 18,629.1. In 1976 there was a continuous demand of passenger transport, which the Akosombo Queen, serving the ports of Akosombo and Yapei (Port Tamale), proved inadequate to meet. 64

The total number of passengers carried by the Akosombo Queen in 1976 was 24,093, including 1,254 tourist passengers, who visited Dodi Island in the Volta River. But the Volta Lake Transport Corporation (VLTC) has been faced with:

an acute shortage of cargo capacity, lack of spare parts, and maintenance facilities as well as inadequate cargo handling equipment. Furthermore, the Akosombo port road reached such a state of deterioration that many bulk cargo handlers refused to carry load to the Akosombo port. 65

And in his recent study on the lake transportation system, David Hilling (1977) concluded that a poor port facilities and great imbalance in traffic flows have created difficulties. 66

However, the water transportation has advantages. The cost of freight is known to be cheaper by waterway than by road. This is particularly important given the high cost of fuel on the world market.

David Hilling has noted that while water transportation is, in theory, slower than a road journey, in practice the often lengthy delays of road vehicles at the Yeji Ferry crossing serve to reduce the difference. 67 The high cost of fuel on the world market emphasized the need to improve on the lake transport system, as this provides cheaper transportation to and
from the north for the bulk carriage of goods as well as the carriage of passengers, according to the 1976 Annual Report of the Volta River Authority (VRA). Since 1920 (and prior to the building of the Adomi Bridge as part of the VRP), vehicles had been queuing daily for the slow-moving Senchi Ferry. The Senchi Ferry served as the major link between Volta and Accra regions. When the Adomi Bridge was opened in 1956, the serious bottleneck was removed.

In 1965, Engmann observed that the whole Volta Basin, prior to the development of the VRP, was served by roads which were generally second and third class. The only existing first class or trunk road joined Ada to Accra, Ada to Aflao and Tema to Kadjebi. In her view, climate conditions made road construction and maintenance difficult and expensive: most of the roads became muddy and sometimes impassable in the rainy season, and dusty in the dry season. In the Afram Plains there were practically no roads, the chief means of communication being a few waterways, rough tracks and footpaths. The lack of communication had seriously impeded economic development in this area.

It must, therefore, be stressed that the emergence of the inland waterway was to enhance the network of communication within the Volta Basin and between the Basin and both Accra and eastern regions; and between the northern and southern sub-regions of the country.

The Volta Lake transportation system now in operation in the Volta Basin under the VRA came into being in 1969. It
started effective operation in 1970 and became incorporated in the same year. It was initially owned and operated as a limited company by the VRA and Elder Dempster but the latter withdrew from the company in 1975. There are now three well-established lake routes in the Volta Basin: Akosombo-Yapei, with average passengers of 7,697.7 from 1970 to 1976 and a total of 53,884 passengers within that period; Akosombo-Kete Krachi and Akosombo-Aman from as well as Kpandu-Yeji and Kete Krachi-Kpandu. 71

The Volta Lake is about 270 miles long and stretches on a north-south axis from Akosombo to within 45 miles of Tamale. This creates an opportunity for commercial inland water transportation within the country. The system covers an area of about 46,500 square miles within Ghana itself and, if the adjacent countries of Upper Volta and Mali, Niger, Benin and Northern Togo are included, the total area covered by this transportation system comes to about 35,200 square miles, and serves a population of some 9 million. The flow of cattle, ground nuts, cotton, foodstuffs from these areas in exchange for commodities like petroleum products, manufactured goods from the south, should generate great commercial activity. 72

It can be seen that the lake transportation system has potential for the movement of cargo and passenger traffic from south to north and vice versa and within the Volta Basin. However, in order to fully benefit from the many potentials offered by this transportation system, much remains to be done.
During the regime of Nkrumah, the government proposed the construction of the transport system as part of the government's Seven-Year Development Plan. Tamale and Tema were to be united by barges along the Volta Lake; road connections were to be made between Tema and Akosombo and between Port Tamale and Tamale. 73 The project involved the building of 12 new ports on Lake Volta, which were expected to be ready for use when the Volta Lake reached its permanent level in 1966/67. With the fall of the Nkrumah government, the proposed scheme did not materialize.

There is now a technical aid agreement between West Germany and Ghana, signed in 1979, for the development of an integrated Volta Lake transport system involving the building of ports along the shore, the provision of jetties, ferries and access roads, including a modern all-weather one to link Tema with Akosombo. 74 Whatever the situation and intentions of the government, the lake transport system is an unfinished but attainable investment opportunity of the VRP. Further development of the water transportation must be seen as a much longer term investment. This calls for a greater imagination, for capital, for reassessment and plan, and for enterprise, either from the public or private source, or both. If this is done, it will ensure an efficient flow of, and access to, resources in the economic development of the Basin.
NOTES

1 Full discussions of hydroelectric dams can be found from the following sources:

(a) Neville Rubin and William M. Warren, eds., Dams in Africa (London: Frank Cass and Co. Ltd., 1968);


2 Electricity Corporation of Ghana (ECG) buys power from Volta River Authority (VRA) and sells it to the general public for commercial and domestic uses. Note also that VALCO, the mines, Akosombo Textiles and Township, as well as Togo and Benin, receive directly their power supply from the source at Akosombo.


5 Ghana News (issued by the Office of the High Commissioner for Ghana, Ottawa, Canada), August, 1979, p. 7.

6 It must be pointed out that under its Seven-Year Development Plan of 1963/64-1969/70, the Nkrumah regime devoted £10 million for distribution of power in southern Ghana (including some 21 towns and villages) and for the improvement of the existing system of distribution. This was part of the government's electrification programme, which had two objectives: first, it was to provide adequate power to meet the requirement for Ghana's industrial expansion and second, it was also to eventually supply electricity to all homes in Ghana. But with the fall of the government of Nkrumah in 1966, the implementation of the programme fell through due to the suspension of Nkrumah's Seven-Year Development Plan. Ghana Today, March 25, 1964, 1(2), p. 9.

7 Yakubu Dadinkai, op. cit., p. 1.
In July, 1964, the Managing Director of Volta Aluminium Company (VALCO), Mr. R.E. Knight, explained that VALCO's inability to construct an alumina plant and develop the bauxite mines in addition to the construction of the smelter as contained in the original VRP plan was due to financial constraint. At that time it was not possible to provide an additional investment for the development of all three components of the aluminium industry: the smelter, alumina plant, and bauxite mines. The processing of bauxite in Ghana requires heavy equipment for the complicated chemical process involved in producing alumina from the bauxite for the production of aluminium ingots. (R.E. Knight, Managing Director of VALCO: A statement issued at the sod cutting ceremony for the beginning of work on the aluminium smelter at Tema, Ghana, Ghana Today, July 1, 1964, 8(9), p. 3.

See Appendix I.

Ghana's lack of coal is well illustrated by a fuel crisis of 1951. In the 1950's, the crisis of fuel was a major source of a higher cost of railway operation in the Gold Coast. As early as 1949 labour troubles of the Enugu colliery in Nigeria (which, since 1920, had been the sole supplier of coal for Gold Coast trains) reduced available supplies and it became necessary to import coal from South Africa. This was made worse by South Africa's inability to supply the Gold Coast railway with coal. An appeal to Britain produced only a little coal, since Britain had none to spare. This led to importation of coal from the U.S., though at a higher price: whereas coal had cost 90s 6d per ton to import in January 1951, by January 1952 the cost had risen to 210s 6d per ton. The significance of this is that the fuel crisis led to the introduction of diesel (oil-driven) electric locomotives in Ghana. Moreover, in August 1951, the Nigerian government without warning had suddenly stopped all coal exports and thereby precipitated a crisis on the Gold Coast railway. And, in addition to being evidence of Ghana's lack of coal, it shows her need for self-sufficiency in power. (R.B. Davison, "The Story of the Gold Coast Railway," West Africa, September 1, 1956, 5, p. 919.

Ghana's first attempt at exploration of oil was started in 1896, but there was no find of large quantity for commercial exploitation. The first discovery of oil was achieved in 1970. However, because of an insufficient amount of oil for commercial exploitation, its further development was abandoned. In 1977 and 1978, when exploration was resumed, another discovery was made. Today Ghana produces over 5,000 barrels (of low content oil, with an API gravity between 36 and 40 degrees) a day. Reserves at the fields are estimated to be about 6 million barrels. This makes it a marginal find (Ghana Commercial Bank, Quarterly Economic Review, Oct.-Dec. 1979, 2(4), p. 4.
E.L. Quartey (Chief Executive of the Volta River Authority), A speech on Industrial and Commercial Opportunities and Volta River Dam, given at the State House, Accra, Ghana, on Thursday, February 9, 1967, p. 3.


Ibid., p. 384.


Over 50 per cent of the industrial establishments in Ghana are concentrated in the cities of Accra, Tema, Kumasi and Takoradi (Ghana Commercial Bank, Quarterly Economic Review, April-June, 1978, 1(2), p. 6).

The first military coup in Ghana was on February 24, 1966, which swept away Nkrumah's Convention People's Party (CPP) after 15 years in power. After 3½ years of military rule of the National Liberation Council (NLC), Ghana was again returned to civilian administration in October, 1969 under K.A. Busia and his Progress Party (PP). In January, 1972, Busia's government was overthrown by another military coup led by Col. I.K. Acheampong. The military regime of Col. Acheampong, National Redemption Council (NRC), and later Supreme Military Council (SMC) ruled Ghana for nearly seven years. Ghana was about to enjoy another civilian government in July, 1979 when on June 4 yet another military coup removed the existing Supreme Military Council, then under General F.W.K. Akuffo, who had, in July, 1978, taken over from Gen. (formerly Col.) Acheampong after the latter had been forced to resign with immediate retirement from the army. The new military government of Armed Forces Revolutionary Council (AFRC), headed by Flt. Lt. J.J. Rawlings, ruled for only four months, from June 4, 1979 to November 24, 1979, when it handed power over to a constitutionally-elected government, the People's National Party (PNP), headed by Hilla Limann. This was a resurrected CPP and is the party presently in power.

See Appendix II.
Whereas in 1950/51 the budget of Ghana's government was £17.2 million, by 1962/63 it had risen to £133 million. And in 1966 it jumped to £185 million when the revenue for that year was only £124 million, giving rise to an estimated deficit of over £60 million. Actual figures are given below:

1959 - £12 million  
1961 - £53 million  
1962 - £28 million  
1963 - £46 million  
1964 - £33 million  
1965 - £19 million

(With no foreign exchange reserves at all), the average balance of payment deficit from 1959 to 1965 is £30.7 million (E.N. Omaboe (formerly Government Statistician and Chairman of the Economic Committee, during the regime of NLC), Address to the Seventh Annual Agricultural Conference of the United States Agency for International Development (AID) in Accra, Ghana Today, May 4, 1966, p. 3).


20 Ghana News, Ottawa, Canada, August 1979, p. 7.

21 Graham Hancock, op. cit., p. 187.


23 Ibid., p. 199.

24 Kwame Nkrumah, Ghana. A Broadcast to the Nation: Statement on Ghana's Economic Policy, Sunday, October 9, 1960. For explanation of each sector, see this statement.
Nkrumah created Ghana Industrial Holding Corporation (GIHC), Ghana National Construction Corporation (GNCC), Ghana National Trading Corporation (GNTC), State Transport Corporation (STC), Ghana Airways, and the Black Starline; he founded the National Investment Bank (NIB), Ghana Commercial Bank (GCB), State Insurance Corporation (SIC); and he established the State Farms and its wing of Workers Brigade, the United Ghana Farmers and Co-operative Council (UGFCC) and so on. This demonstrates clearly Nkrumah's strong desire to control industrial development both in manufacturing and agricultural industries, construction and financing. As Paul Kennedy has noted, it was designed to build up the state sector as part of a quasi-socialist strategy in order to increase Ghana's economic independence. Sometimes foreign capital was used, but Ghanaian private business was intentionally excluded because of Nkrumah's desire to build Ghana as a socialist country. (Paul Kennedy, "Indigenous Capitalism in Ghana," Review of African Political Economy, January-April, 1977, p. 32).

In the period of the NLC, through the encouragement of government, Ghanaians were expected to assume an increasing role in the private sector. By the government's private business decree of 1968, the NLC attempted to encourage the growth of private business in Ghana. In the private/government business sector, business enterprises were to be organized on a purely voluntary basis in that no private enterprise would be compelled to accept government participation, and every application from a private enterprise inviting the government to participate in the enterprise would be considered on its own merits. In the government sector, active state participation would be limited to certain basic and key projects. The co-operative sector was to contain simply producer and marketing co-operative.

The NLC economic policy was strengthened by the Busia government. It passed the Business Promotion Act, which strengthened the NLC's decree on private business. The Business Promotion Act effectively limited all trading and manufacturing enterprises under a certain size to Ghanaians and reserved some sectors of the economy entirely for indigenous businessmen and women, regardless of size or capital involved. In 1972, the NRC also provided some help for local business. Loans were made to people willing to invest in farming projects. And in December, 1976, the NRC's investment policy decree declared that henceforth Ghanaians must be allowed to hold a majority of the equity shares in foreign-owned companies (Paul Kennedy, op. cit., pp. 32-33).


30 James Moxon, op. cit., p. 212.

31 Ibid., p. 213.


39 Ibid., p. 228.

40 Ibid., p. 228.

41 *Ghana* 1977, p. 35.


46. In 1977, industrial consumers of the Akosombo Power took 100 MW or 53 per cent of the total power supply. Of this, state institutions used 47 per cent, foreign and joint foreign-local enterprises 37 per cent, while Lebanese owned business and wholly-Ghanaian owned business enterprises took 12 per cent and 6 per cent, respectively. Thus, even in the industrial sector, the use of power is largely concentrated in the hands of a few companies, mostly by non-Ghanaians ("Imperialism and the Volta Dam," West Africa, April 11, 1980, p. 657).

47. In 1952, Tema was a fishing village with between 4,000 and 6,000 people, rising to 12,000 in 1959. In 1963, the population of Tema rose to 27,000 two years after the construction of the Tema harbour, but the township lacked such services as hotel, or catering rest house, a rest house, a specialized hospital, a public library, and so on. It ranked very low as an urban centre. In 1968 Tema's population rose to 85,000 and to 250,000 by 1969. Now Tema is the most industrialized centre in southern Ghana because of industrial and commercial growth.


49. The VRP's Master Agreement (a record of all the commitments related to the understanding between all the parties concerned with the VRP) allowed the use of some 710,000 acre feet of water for irrigation purposes. This amount of water was considered sufficient to cover all the foreseen needs (VRP Preparatory Commission's Report (London: HMSO, 1956), p. 229) (Appendix VIII).


51. A.M. O'Connor, op. cit., p. 60. Note that in 1973 a financial loan of $15.6 million from the International Development Agency (IDA) was given to Ghana to rehabilitate the Asutsuare and Komenda sugar estates and factories, but they failed to produce better results ("Report on Sugar Project Failure," West Africa, February 4, 1980, p. 226).

53 Ibid., p. 20.


60 Lawson, op. cit., p. 226.


67 Ibid., pp. 312-313. Note, in addition, that the cost of moving a heavy tractor from south to north by lake transport is about £260 as compared to £1,000, being the cost by hired road low-loader, according to Hilling, Ibid., p. 312.


71 David Hilling, op. cit., pp. 312-313.

72 E.L. Quartey, op. cit., p. 4.


In Chapter V the intended consequences of the VRP were discussed. But I have also indicated that the VRP had two main consequences, intended and unintended. The unintended consequences were defined as those results of the VRP which were not originally envisaged. The VRP has had two main unintended consequences, which are partly beneficial and partly detrimental. The first consequence was the displacement of people brought about by the development of this project. And the second consequence is the side effects of Lake Volta, which also came into existence as a result of the Volta Project. In this chapter I will discuss these major unintended consequences of the VRP, indicating the extent to which they have both been beneficial and detrimental socially and economically.

**The Resettlement Scheme and Agriculture**

As already indicated, an immediate effect of this Project was the resettlement of about 80,000 inhabitants of the Volta Basin. The resettlement of these people did not only have some implications for the Government of Ghana, who saw the scheme as an opportunity to "promote healthier living and scientific mixed agriculture" in the rural Volta Basin. It also had
The Implications of the Scheme

In May, 1962, the Working Party for the resettlement scheme decided that the scheme should be used:

1. as an opportunity to enhance the social, economic and physical conditions of the people;
2. to improve their system of agriculture to enable them to effect the transition from subsistence to cash economy;
3. To plan and locate the resettlement in a rational manner so that the flood victims as well as others in the Volta Basin area can derive maximum benefits from the changes involved.

Therefore, the resettlement scheme must be seen not as primarily and merely an humanitarian and political gesture, but also, as Nicholas has noted, "a unique opportunity to wean appreciable proportion of Ghana's farmers from their wasteful, fragmented, and shifting system of agriculture to a settled and improved pattern of farming." The scheme was thus seen as a means by which agricultural transformation could be introduced in the Volta Basin and physical conditions of rural life improved. It also meant that the scheme required an elaborate plan and policy for its implementation so as to achieve a desirable result. In the discussion of this scheme, therefore, I will stress mainly the consequences of the scheme, especially as both the instrument and process of modernization.
Resettlement Townships and Housing

(i) Townships

The government introduced a new pattern of townships in the rural areas based on a four-tier settlement pattern consisting of: first, central towns with population of 8,000 to 10,000; second, service centre villages with population of 5,000 to 8,000; third, satellite villages with population of less than 5,000; and finally, farm houses and homesteads in the small traditional villages. Each settlement pattern was provided with different levels of facilities and services. And in order to serve a larger section of the rural communities in the Basin, the resettlement townships were arranged in such a way that their services would either benefit the existing towns or the services of the existing towns would benefit the new settlements.  

The scheme involved the development of new communities which included houses, markets, schools, and water supplies, as well as access roads and clearing for farming. These new communities were classified into three main sectors: a North-East sector which re-established and re-directed the communication lines affected by the lake; an East Volta sector which fitted new settlements and services into the existing hierarchy of service centres; and an all-season system of communication and a new pattern of service centres in a relatively thinly populated and under-serviced area. Each sector was provided with a service core centre: sanitary and central commercial areas where schools, markets, lorry parks and the main stores of the settlements would
be located. It appeared that in the hinterland of the Volta Basin the new townships would serve as a symbol of modernity and a sign of physical progress in the living conditions of the settlers. But it will be shown later that the settlers did not apparently see it that way.

(ii) Housing

On the other hand, in the resettlement towns the settlers were provided with three main forms of "core houses" - P, R, and D house types. A core house of any of those house types constituted a provision of a standard minimum level of housing for all the settlers. It comprised of a concrete floor with aluminium roof provided ready for two rooms, and cooking and sitting porches. The core house also had walls completed for only one room. The remaining walls were to be constructed through "aided self-help" (self-help with technical assistance from the government) after settlement. The core house was intended to help the settler to provide his own complete house. Thus, it was so designed as to enable a settler to expand it to suit his needs for extra rooms and other house facilities such as kitchen and bathrooms. But when Butcher studied the resettlement scheme in 1968, he realized that the settlers did not see the provision of the core house that way. The settlers felt that the government was supposed to replace their flooded houses.

Consequences of the Resettlement Scheme

The resettlement scheme benefitted the settlers in several
ways. The settlers were provided with relatively high standard of living through the building of new townships and housing in social services not available to them in their traditional set-ups.

Before the flooding of their lands and before their involuntary migration, most of the settlers lived in mud huts with thatch roofs which were valued at less than £20 each. But they were resettled in 52 new communities with houses estimated to be on the average 700 new cedis for an uncompleted core house and 1,200 new cedis for a completed house. Amenities and facilities like water supplies, roads, schools and markets were provided in the resettlement towns.

However, there were a number of problems that cropped up, in terms of housing, social amenities and social life, in these resettlement towns. Because of its single room base, the resettlement housing posed several problems for settlers, especially those with large families. The single room core house was found to be inadequate because it gave rise to overcrowding. It was found in 1965 that five to six persons ate and slept in the single room core house. And those who were greatly hit by the lack of adequate sleeping space and who also experienced a considerable inconvenience were polygamous men. They had to share the single room with their families. The fact that the
core house was inadequate was seen as the strongest complaint among the settlers.¹¹

To overcome some of their housing problems, settlers put up unauthorized structures (enclosures of all kinds which did not conform to architects' plan) for various uses as baths, kitchen, hen coops, extra rooms, and so on, using materials obtained from their old houses. According to Chambers, the building of unauthorized structures became an issue with the VRA officials, who said that the structures marred the beauty and modernity of the housing system. But the authorities failed to resolve the issue after an investigation in New Ajena, where a large number of these unauthorized structures had been put up.¹² Nevertheless, it must be stressed that the provision of core houses meant that the settlers would further develop their own core houses. It also implied an aided incentive towards the process of modernization in the rural housing. Even so, it cannot also be denied that the government's attempt toward an "induced" social change such as motivating rural people to improve their physical conditions in this way in terms of housing failed to communicate the desirable message. It can further be argued that Lerner's concept of empathy here breaks down, not because the settlers lacked the psychological urge to change their mode of housing or respond to change, but because they either lacked the means with which to further develop their houses up to the required standard or they had other uses for their disposable income.
Since the implementation of the resettlement scheme, studies done on some of the resettlement towns indicate that public services like water supply, communications and health have been insufficient, poor or non-existent. In 1965, Martha Dodoo found that the settlers in New Mpamu complained of the insufficient water supplies, lack of clinic and police post in their town. In his 1968 study of the Volta Project Resettlement Scheme, to which reference has already been made, Butcher found some of the grievances of the settlers to be irregular and poor water supply, poor communications and lack of market facilities. In the 1970's the situation had hardly changed. Paul Lumsden, in his study of New Grube resettlement township in 1973, noted that provision of better water supplies, health and communications would enhance economic activity in Nchumara area, where yams and other foodstuffs, which are in great demand in the south, are produced. But those facilities were lacking.

Like the house-extension programme, however, there was provision for the development of social amenities such as markets, health centres, community centres and water supplies. But these were meant to be accomplished by the people through community development programmes with the assistance of the Social Welfare and Community Development Department. Even so, as Kalitsi suggested in 1965, the settlers required financial and educational support to enable them to provide some of these
social services themselves. Moreover, the department in question has hardly done much, if anything at all, towards further development of the settlement towns.

In the new communities social relations among the settlers assumed certain dimensions. It was not easy for the settlers to initially get on well with one another as ethnic individuals or groups. The settlers were people of varying social patterns, forms and beliefs brought together through the creation of larger communities out of smaller and isolated ones. In the resettlement units they retained their traditional leaders, social systems and customs, not to mention related elements of status and roles of the different traditional authorities. Thus, on the one hand, the main problem was how to avoid conflict among one another, and on the other, how to achieve harmony between the Town Development Committees and the traditional authorities. In New Mpamu, for instance, there was a political rivalry between the chiefs of different traditional standing. And 'intraward' relations were more prevalent than interpersonal contacts. Also, in New Grube, Paul Lumsden found political relationship between the five village groups in the VRP's resettlement site to be antagonistic and among the groups was "a shared dislike of Akaniem's political ambitions" in the area. But Lumsden also observed that these groups were often brought together by funeral celebrations in the area. These instances suggest that there was lack of effective means of communication. But
in order to reduce conflicts and tensions, this was desirable. This point will be elaborated later.

The resettlement imposed other sorts of strains on the people because many lost their traditional means of livelihood such as farms (including crop bearing trees) and for those settlers whose farmlands were not replaced, they were forced to survive on their own in the townships. In the traditional village life, the old and the weak are secured against starvation because relatives in the same compound take care of them. But in the township's life everyone has to be on his own, living in his nuclear house and farming on his separate plot. The settlers do not produce a surplus for their immediate family because farming is commercial, not subsistence, and so they can hardly help their neighbours.

The settlers had the challenge of living together as heterogeneous societies, and of taking advantage of the opportunity offered them, to live a new life style in rural areas in terms of new amenities and new types of housing. The maintenance and further development of their new communities (modern townships) must conform to certain standard township and housing regulations of which they are less informed. All these raise several questions for the planners and planned, regarding "modernization and social change" from the western point of view as was done in the VRP. Questions about financial and educational support, new values and discipline in the use of public amenities, and so on, and finally, how to reach the people with new ideas, and to seek their support and understanding over issues that
may crop up, can all be envisaged. This will be taken up again.

The Agricultural Programme

Closely associated with the resettlement scheme was agricultural programming for the settlers. The agriculture programme was seen by the government of Ghana as a great opportunity for introducing social and economic change in the rural Volta Basin. In addition, the agricultural programme was seen as an important part of Ghana's Seven Year Development Plan. The pattern of farming was to meet the needs and target of the Seven Year Agricultural Plan in which local cash and export crops were to be developed to conserve and earn foreign exchange. The farming was "to produce foodstuffs for human consumption and feed for livestock and thereby improve, through the supply of more protein, nutritional standards of people."  

The agricultural policy had three key elements. First, the government thought that since land was not enough to absorb the large influx of people, it was advisable to adopt a system of scientific farming instead of allowing the so-called wasteful system of shifting cultivation which requires more land. For the government, the scientific methods of farming imply the choosing of suitable soils, using improved seeds, and applying fertilizers, manures, insecticides, and practising crop rotation.

Second, intensive arable production was to be practised based on mechanization. Mechanized farming did not imply only the use of tractors and ploughs for opening up the soil, extract-
ing of weeds and harrowing, it also included the use of machines for planting and sowing of seeds, for spraying and fertilizer application. The government agriculturalists were convinced that the best way to attain the required high yield in the field of production was to introduce mechanization.

Third, farming was to be on co-operative lines; each farming family would have its own farm plot, but the use of machinery, the purchase of farm materials (such as fertilizers, seeds, insecticides, and so on) and marketing of farm produce would be handled by the co-operatives which would deduct charges for the services rendered by the equipment provided by the government. It was the central co-operatives that, as already stated, would take charge of the overall operation of the co-operative farming. It follows from this that the type of co-operative envisaged was consumer and producer co-operatives in that farming inputs were to be purchased in bulk and shared or distributed among the farmers. And farming produce, on the other hand, would be marketed through the agency of the co-operatives.

Finally, the agriculture programme was to be practised in three main areas. On the flat land, mechanized arable cultivation was to be introduced for crops like maize, ground nuts, tobacco, sweet potatoes, cocoyam, yams, cassava and vegetables, all of which are crops generally grown by the people. A rotation system based on the regional and district experimental station's recommendation was to be used. In the Savannah zone, where the soils are considered generally hard, the existing pastoral type of farming was to be improved by the introduction
of better goats, sheep and cattle, and by disease control and vegetable production. And in the transitional zone of the two systems, mixed farming was to be actively encouraged according to the particular soil and ecological conditions.

From the above it can be seen that the agricultural programme had four main elements: it should be scientific, mechanized (as far as possible), a co-operative system, and commercial. Thus it can be concluded that the programme was an attempt towards agricultural revolution in the Volta Basin. For the settlers this implied a new type of farming based on rotational planting system, and mechanized and co-operative form of farming, commercial instead of subsistence agriculture, new crops, and so on. There is no doubt that this was a formidable challenge to cope with on the part of the settlers, given the fact that they were illiterate farmers who had no idea of scientific farming, and that it required several inputs, such as knowledge and skill, capital, machinery, education, and so on. In this sense, one would expect that the government would deal with the question of modern methods of farming and the commercial aspects thereof with great concern and enlightened approach, especially because of the problems involved and also because of the importance the government attached to agricultural revolution. The outcome of this programme will indicate whether or not the government felt that way.
Consequences of the Agriculture Programme as an Agent and Process of Modernization

It has been noted that the agriculture programme was meant to provide the settlers with a kind of farming that would enable them to achieve a higher standard of living. Because of insufficient land for extensive shifting cultivation, a more intensive system of farming was considered desirable. The Ministry of Agriculture thought that it would be possible to introduce the practice of mechanized agriculture and farmer-co-operatives. But both failed.

Several factors contributed towards the failure of this programme. But the key ones can be identified in terms of their social and economic dimensions. Socially, the scientific, mechanized, co-operative and commercial approach to farming in the resettlements failed to secure the understanding, and hence win the support, of the settlers for a good number of reasons.

(i) Scientific Farming

The failure of scientific approach to farming in the new settlements was partly due to lack of good public relations and agricultural extension services. According to Lawson, this contributed greatly to the farmers' lack of confidence and understanding of the scheme. Rural radio forums which Ghana adopted from Canada, established in Ghana through Canadian technical assistance in the mid-1960's, would have helped to meet the pressing need of educating the resettlement farmers regarding the opportunities of farming scientifically. According to McAnany, the "Basic Village Education Project" in Guatemala showed that
adoption of new agricultural practices was one social benefit that was related to exposure to a special agricultural radio programme. He also contends that when the media are used purposely for development communication projects they can promote some change, although he further explains that even under favourable circumstances constraints limit the impact to modest positive outcomes in some cases. But, as George Benneh has pointed out, it is a problem to persuade illiterate farmers who have grown to depend on and trust a system of farming which forms part of their heritage to accept a new technique involving cash inputs. He has also indicated that the success in the use of fertilizers in order to produce higher yields depends on a guaranteed market, stable prices, good storage facilities and a knowledge of the type of soil, and the time of year to apply it. In addition, there is also the problem of providing supporting services such as extension officers (something like one extension to every thousand farmers would be required). However, in his view, apart from the prohibitive cost of training such large numbers, it is difficult to envisage how innumerable farmers, each cultivating a few dispersed plots of a hectare or more and assisted in all matters by a host of extension workers, can provide the basis for a profitable and efficient agriculture. He has therefore suggested the need for a less expensive method of maintaining soil fertility which would not necessitate a complete break with the bush fallow system and so be easily adopted by the illiterate farmer.

Individual farmers lacked sufficient effort, had a reluctant attitude towards innovation and change, and persistently assumed that the government should do much more for them, according to
Lawson. She also said that host communities which were promised some participation in the improved system of agriculture from which they had not benefitted viewed with some envy the improved housing and village amenities of the settlers, and so were unhelpful.\textsuperscript{26}

Finally, in the resettlement agriculture, land was allocated by leasehold, not freehold. But the farmers wanted freehold land. Moreover, farmers were expected to observe certain tenancy regulations such as cultivating land in accordance with recommended practices, for example, and following as far as possible a suitable time of sowing, using the recommended improved variety of seed if and when available. These regulations were enforced through a close supervision of Extension Workers.\textsuperscript{27} To the farmers, all these measures implied a new mode of farming, one based on externally imposed, but not self-imposed, discipline. But they wanted their former economic freedom as owners of land and the right to decide for themselves.

(ii) The Practice of Mechanized Farming in the Resettlements

Settler participation in mechanized farming, as Chambers has indicated, was hindered by a number of factors. First, because of the fear of relying on one mechanized crop, settler farmers gave priority to their separate food crop production. Second, absenteeism made co-ordination of mechanization difficult because settlers sometimes neglected their important duty of curing the tobacco. The agricultural staff was thus compelled to either perform this duty or lose the crop. Third, until 1968, tractor service was freely provided but, when charges were subsequently introduced, most of those settlers who
previously accepted mechanization pulled out. Chambers has further pointed out that generally government-operated mechanized cultivation schemes have certain major set-backs. In terms of their control of tractor operation, and in the maintenance and supply of spare parts, they are not reliable. With the Volta agriculture programme he has contended that these problems were aggravated by the dispersal of the settlements and difficult communications. Moreover, despite their having worked little, by mid-1968 about one-third of the tractors on the resettlement farms were unserviceable. In his view, therefore, the mechanical cultivation programme became economically a disaster.\textsuperscript{28} In summary, however, there is no doubt that the failure of the mechanization was partly due to the inability of the agricultural staff to effectively explain economic benefits, and demonstrate the usefulness, of mechanization to the farmers who, being largely illiterate, required education and effective communication.

(iii) Farmer Co-operative System of the Agriculture Programme

Since the establishment of the United Ghana Farmers' Co-operative Council (UGFCC) in Ghana in the 1960's, farmers in the country had tended to associate co-operative organization with the UGFCC, which was a wing of the ruling Convention People's Party (CPP), and with exploitation of farmers by petty party officials (in recent years by "secretary receivers").\textsuperscript{29} Consequently, as Lawson has pointed out, because of political ambitions which were associated with the co-operatives in
agriculture in the Nkrumah regime, the movement had gained little respect among farmers.³⁰ In the Volta resettlements, Chambers has stated that farmers regarded co-operative organizations not as voluntary but as schemes imposed by authority which were inferior to their traditional practices.³¹ Whatever the implications of the farmer-co-operative to the farmers, Lawson has noted that the Volta agricultural organization was misnamed in that only the mechanized inputs and marketing of farm produce were to be organized on a co-operative basis.³²

Nevertheless, as Chambers has observed, junior agricultural staff did not themselves have a very clear idea of what co-operative organization implied and few co-operatives were launched. Moreover, in his view, these were not necessarily pioneering ventures.³³ Therefore it can be said that as an economic organization the farmer-co-operative was ill-understood by both the farmers and the agricultural extension officers. For this reason alone, the co-operative system stood very little chance of being successful. Also, it implied that the government failed to educate the farmers as to the usefulness and objectives of the farmer-co-operative. Presumably it was hardly clear to them as to which type of co-operative system was in operation - the producer co-operative, or the marketing co-operative, or the consumer co-operative, or a combination of any of these. But since the farmer-co-operative was intended to handle farm inputs and to distribute farm produce, it can be said that the system in operation was consumer and marketing co-operative.
(iv) Economic Implications of the Programme

In addition to social problems, there were other problems in the economic sphere. Adequate farming land could not be made ready for the settlers before their arrival because the necessary equipment (tractors and ancillary equipment) was not installed in time due to political interference in the agricultural scheme. When equipment was made available, lack of time, bad weather, shortage of spare parts, and so on, rendered the use of the equipment for the clearing of vital farmland and town sites highly competitive. Availability and access to starting capital was a problem for many settlers. Payment of compensation to the settlers was the primary source of working capital for many of them. The method of compensation employed was that the cash value of their flooded crops was added to that of their flooded house. The total was then set against the cost of their new house and, if their compensation total exceeded the cost of the house, they received the balance. If their crops and old houses were valued at less, they received no cash.

The effect of these measures was that a good number of the settlers had little or no working capital. Consequently, they sold their resettlement houses unofficially in order to make money. And because of the emphasis laid on the importance of legally acquiring and paying for farming land, many settlers had no land on which to farm. In 1973, Paul Lumsden noted that at New Grube resettlement, 66.2 per cent of the 201 male household heads surveyed on scarcity of farm land believed that there
was not enough farmland for all to use in the area.\textsuperscript{36} Thus, problems of land and capital have impeded the economic viability of commercial agriculture in many of these settlements. Moreover, as the Report of the WFP Mission on \textit{The Appraisal of the Volta River Resettlement in Ghana in Regard to WFP Assistance} (1967) states:

Most of the agricultural plans (of the VRA hitherto) were inadequate and unrealistic and the limited staff available at the time was neither sufficiently qualified nor experienced for the work, particularly in regard to agricultural economics, marketing, co-operatives, farm management, etc.\textsuperscript{37}

This means that the agriculture programme also lacked adequate and competent agricultural personnel to effectively deal with fundamental elements of commercial agriculture in these re-settlements (such as agricultural economics and management).

Finally, marketing of farm produce was inadequate and mismanaged in those few settlements where there were adequate crop harvests. For example, at Nkwakubew, which had the largest crop farming, most of the harvested maize was handed over to the Food Marketing Board, but owing to poor administration, there were long delays of five to six months before farmers were paid.\textsuperscript{38}

The failure of the mechanized and scientific agricultural programme to provide a livelihood for most of the settlers in the foreseeable future resulted in the revision of the agricultural programme in 1966. The government acquired land and then issued renewable 33-year leases to the settlers and host farmers who wanted to become tenants. The World Food Program (WFP
Project 356) provided food aid to feed settlers while they hand-cleared land for subsequent food cultivation. And although the plots were initially to provide subsistence food crops, agricultural staff were to maintain, and in fact did maintain, some surveillance of scientific methods of cultivation, as indicated elsewhere in this section. The VRA officially pursued two main objectives: the settlements should be made economically viable, requiring no further assistance from the government; and there should be a transition from subsistence to commercial agriculture.

The government attempted to initiate social and economic change in the rural Volta Basin through the implementation of the scheme so that it might serve as a pattern for the Volta Region and the rest of the country. The government saw the resettlement scheme as an opportunity to transform the social and economic conditions of the people in the Volta Basin. In this sense, it can be said that the resettlement policy was an instrument and process of modernization. But the revised policy failed to materialize for various reasons. As a process of modernization, the resettlement policy, from both social and economic points of view, not only presented several problems but also failed to achieve its objectives: first, to bring about economically viable rural communities in the Volta Basin; and second, as an agent of modernization that would have served as a national rural community development model.

It has been indicated that many of the settlers migrated,
either permanently or temporarily; a good number of those remaining became apathetic, dependent and suspicious of the official resettlement policy; access to adequate farmland became a big problem; and farmers' co-operative organization was seen by the farmers not as voluntary but compulsory economic movement meant to undermine their traditional practice. They also felt that planned agriculture deprived them of their traditional economic independence (for instance, as owners of land, like many of their fellow Ghanaians). Access to adequate farmland became a big problem because there was no legal means by which land could easily be obtained. Land could be obtained through customary means for use, but not "saleable" in the western sense. Commercial agriculture on the settlements and in the country at large did mean that farmlands should be saleable commodities - that is to say, that commercialization of farmlands was what the Government of Ghana envisaged in the long-run. This is because in order to encourage large-scale commercial agriculture, land must be readily bought and sold. But this conflicts with traditional concepts of land in terms of ownership and utilization of land for farming and other purposes. Traditionally, land is not a saleable commodity anywhere in Ghana. Since the government did not institute land reform measures which would have ensured easy access to farmland, there was little hope for the success of the government's approach to commercial agriculture on the settlements. Access
to adequate land must be seen as a prerequisite for commercial farming. And therefore land reforms must also be seen as part of the modernization process of which the whole agriculture programme was about but for which the government did not have an elaborate plan or measures to contain real or potential socioeconomic conflicts. Regarding the co-operative organization, it was seen that junior agricultural staff themselves did not have a clear understanding of co-operative organization, let alone being in the position to explain and help in the organization of co-operatives. In any case, the resettlement co-operative system was largely intended for the distribution of farm machinery and equipment, including other resources like fertilizers, insecticides and so on, and for marketing of farm produce.

The settlers did not either understand the resettlement policy or they did not find the measures involved accommodating. In either case, this is a clear case for the need of effective channels of communication, among other things. However, these problems impeded the agricultural programme. And, in addition, there was a tendency on the part of the government to stress a social welfare, more than economic, approach to the planning and implementation of the scheme. The success of the agriculture programme also implied the success of communities.
ultimately because it would have ensured economically viable communities. Pressure of time, nevertheless, was a major factor in creating this situation, since the evacuation exercise had a limited time for planning and implementation (from May 1962 to mid-1964). The revision of the Volta Project brought this time pressure. In the resettlement townships, settlers were unable to further develop their townships and housing without first seeking official approval. An apparent lack of guidelines regarding the development of the towns and their housing impeded the development of the towns.

Summary of the Resettlement and Agriculture Programmes

It can be summarized that the resettlement policy was intended to be self-help. The settlers should be helped to settle by themselves with some incentives from the government. It was also intended that no drastic change in the settlers' social and economic lives was to be initiated. The evacuation exercise was therefore not meant to be expensive, centrally managed and operated. Rather, individuals should make use of their compensations, in addition to technical and material assistance to be provided by the government.
However, the Government of Ghana, for political and social reasons, adopted a policy which meant the provision of houses, and which involved the grouping of settlers into larger units of communities, and the provision of a higher standard of living through the establishment of modern townships and improved agriculture. By doing so, it cost the government Nc26 million: Nc21 million for the resettlement scheme and Nc5 million for the agriculture programme up to June, 1968; and from July to December 31, 1971, an additional cost of Nc7.7 million, bringing the total expenditure to Nc34 million cedis (between £16 and £17 million). The original estimated cost as suggested by the Preparatory Commission in their report of 1956 was £4 million maximum. 39

In spite of the huge expenditure on this scheme, the outcome, in regard to the government's attempt to initiate economic development and social change which would have served as a model to the rest of Ghanaian rural communities, proved to be largely unsuccessful. The failure can be attributed to a number of factors. First, from the administrative point of view, the scheme lacked a comprehensive plan, a short and long-term objectives with specific targets to be reached within given constraints of time, and available resources such as capital, machinery, personnel, and so on. This would have ensured a continuity in policy and a sense of direction. Second, the people were either disregarded or taken for granted as a factor. They had a limited say in the planning and implementation of the programme. But there
was no doubt that the ultimate success of the programme depended upon their attitudes and beliefs, their understanding and support at every stage in the planning and implementation of the scheme. Third, and finally, in addition to educating the settlers on the agriculture programme, employing an effective means of communication, the programme itself required different and adequate inputs such as land, capital, marketing facilities and competent personnel. For these reasons alone, the scheme stood little chance of success.

The Side-Effects of the VRP

Health And Environmental Problems

A major side-effect of the VRP is the growth of water-borne diseases in the Volta Basin. The formation of Volta Lake has increased health hazards around the basin of the lake, and as a result has led to a deterioration in the health of people in the Volta Lake area, especially in the health of the fishing communities along the shores and catchments of the lake. The lake has proved to be a favourable breeding ground for schistomiasis (bilharzia) and onchocerciasis (river blindness). At the end of 1961, 10 per cent of the children between 10 and 15 years were affected by bilharzia. By the end of 1968, the rate was closer to 100 per cent and in 1970 the rates were almost the same. In regard to river blindness, Omo-Fadaka
found that half of the people over 40 years old living on the lake were blind as a result of simulium fly bites which cause the disease. The catchments and the shores of the lake are breeding grounds of the simulium fly, the insect vector of the onchocerciasis disease. The people on the former breeding grounds of the Volta prior to the formation of Lake Volta are now being infected by simulium flies from the Volta's tributaries. In addition, the installation of the turbines and tunnels in the dam itself have become other breeding grounds.

Similarly, the increase in bilharzia in the Volta Lake area was due to the ecological change which has favoured the growth of both fish and water snail (a vector of bilharzia). With some 60 to 70 thousand Ewe fishermen and women coming from the Lower Volta where bilharzia endemity was high, an infected population moved in and scattered on the lake. The attraction of this large-scale migration was the fish explosion.

In their studies ("Ecological Studies of bulinus rohlfsi, the intermediate host of schistosoma haemotobium in the Volta Lake") in 1977, R.K. Klump and K.Y. Chu of World Health Organization (WHO) traced the vectors and the infection of bilharzia to two main causes. They found that cerotophyllum (a plant) is the most important plant in promoting the vector snail that causes schistomiasis (bilharzia). Their study of the incidence of bilharzia on the Volta Lake indicates that transmission of bilharzia on Lake Volta varies significantly according to shape,
vegetation and geographical location of water "contact sites." They also found that the transmission of the disease is distinctively seasonal in most villages in the Volta Basin - the highest transmission occurs from December to April, with the months of January, February and March being the most dangerous in that order. Their study indicated that the high rate of incidence of bilharzia can be attributed to the extreme susceptibility of the snail as well as to the confined activity and high frequency of human contact in the water contact sites.

The rate of schistosoma haemotobium (bilharzia) among all age groups in the 26 sampled villages ranged from 31.7 per cent to 100 per cent, with 80 per cent as the prevalent rate in most villages. In spite of the high rate of incidence, the study of Klump and Chu contends that control of the transmission of schistosoma haemotobium in the Volta Lake is both attainable and feasible with existing methods of combating it.

Social and Economic Effect of Bilharzia and Onchocerciasis

The effect of bilharzia and onchocerciasis cannot be taken lightly. The use of chemicals for eradication of the carrier of bilharzia which has been found to be effective is also known to be a water-pollutant. So far, the best solution to this problem is for the fishermen to "enter the lake only early in the morning and in the evening when the density of the parasite is practically nil." This obviously limits, as Dr. Lavois-Pierre has pointed out, the daily fishing activity of the fishermen
and women, and hence, it must be added, the fishing industry as a whole at a time when fishing has proved to be a dependable occupation for many thousands of the Volta Basin inhabitants. Similarly, Waddy has noted that "ochocerciasis and simulium inevitably cause depopulation." 

**Public Health Administration of the VRP**

The Public Health aspect of the Volta Lake Research Project came into operation in January 1968. This became necessary because of the VRP. The Volta Lake Research Project is charged with the responsibility of conducting epidemiological surveys over the Volta Basin areas. Its responsibility also includes the establishment of a system of surveillance, and the development of appropriate control measures.

In financial terms, Lake Side Health maintenance has been relatively significant. It was estimated that the cost would be £1,100,000 a year during the period of construction of the project and £135,000 per year thereafter. But in 1966, when the project was completed, it had cost the VRA £1,247,018 to maintain the Lake Side Health during the period of construction, while the Lake Side Health and Safety maintenance expenditure as a percentage of the power sale was 3.7 per cent (707,323 cedis) in 1974, 4.3 per cent (820,565 cedis) in 1975, and 3.9 per cent (1,108,285 cedis) in 1976. In light of the above,
it can be seen that the environmental consequences of the VRP in terms of social, economic and financial costs have been relatively significant.

The Effects of the VRP on Social Life

On the other hand, the Volta Project has produced some health benefits. First, the additional source of fish meant an increase in Ghana's protein production and a decline in malnutrition (kwashiorkor) both in the Volta Basin and the country at large. Based on Ghana's 1957 population of 5 million, the per capita consumption of fish was 40 lbs. and the per capita cost was £0.4 million. In 1966, Ghana's fish consumption totalled 111,000 metric tons, rising to 116,000 metric tons in 1967, a 4.3 per cent increase. In 1967 the per capita consumption per annum on a population of 7.9 million was 32 lbs. The reduction was due to more fish production.

Lawson found a considerable improvement in protein consumption of the people in Lower Volta in 1965 as compared to the 1954 period. She has suggested that it was due to an increased consumption of river fish and shell fish which in 1954 were scarce owing to the seasonal floods. This led to much improvement in the calcium and protein content of the people's diet. The amount of protein consumed rose from 57.5 gm in 1954 to 98 gm in 1965. Lawson also dealt with social and economic aspects of Volta Lake's fishing industry. She found that fisher-
men were earning incomes several times their previous levels, and weekly earnings of $13 were noted. According to her, much of this money has been reinvested in the industry. In 1966, the level of investment in fishing was within the region of $100 per canoe (including the cost of the vessel). With 4,000 canoes in operation, the total capital investment was $400,000. In 1970, there were 12,637 (an increase of over 8,000) canoes on the lake. Based on the $100 per canoe, this represents a total investment of $1,263,700. Most of the money earned in 1966 by fishermen appeared to have been either reinvested in canoes and nets or sent to ancestral villages downstream where it was used for building houses.

Finally, the fishing industry has had some multiplier effect, notably in greater employment for carpenters, wood cutters, and so on, in canoe building and in increased trade and transport. Fresh fish fetches a higher price on the market, but because of the transportation, storage and preservation difficulties, fishermen are compelled to process the fish before sale. This meant jobs for fish smokers. Processed fish are conveyed by transport launches to some four major and six minor lakeside markets, from where they are further transported by roads to the big inland markets.

Summary of the Consequences of the VRP

Studies done on man-made lakes generally indicate that there are advantages and disadvantages in man-made lakes, with the VRP
being no exception. The VRP has brought about enormous benefits such as power generation, irrigation, water supply and flood control, navigation and fishing. In addition, the availability of power has generally enhanced the growth of industry, commerce and the use of power for other purposes in Ghanaian society. The combined effects of these benefits mean some improvement in the living standard of Ghanaians, both now and in the future.

On the other hand, the development of the VRP has had its side-effects. In addition to the hardships it brought to about 80,000 Ghanaians, the formation of the Volta Lake aggravated water-borne diseases like bilharzia and onchocerciasis in the Volta Basin, which have been a source of great concern to the Volta River Authority in Ghana. From this it can be concluded that the very VRP designed to bring about improvement in the living and working conditions of Ghanaians has also been susceptible to serious social and health problems. But the development of hydroelectric projects all the world over always tends to create diverse consequences, intended and unintended. The experience from the VRP must be seen as such.
NOTES


19. Ibid., p. 129.

20. According to the Seven-Year Development Plan of 1963/64-1969/70, "the resettlement is being treated as an exercise in positive economic development on regional basis designed to transform the areas and the lives of the people involved. This means that the new forms of farming, fishing and industry will be introduced into those areas, both for the people who are moved and the people already resident in the area of resettlement. The organization of settlement, the types and standards of housing, and access to public services will all be modernized in the long range resettlement scheme....But it is intended that the development of the resettlement area should continue to be looked at as a whole and treated as a special undertaking within the overall national development plan." Seven-Year Development Plan for National Reconstruction and Development, Financial Years 1963/64-1969/70, (Accra, Ghana: Office of the Planning Commission, March 16, 1964), p. 210.


The use of radio forums is based on the premise that problems of adult education in rural areas could be relatively overcome by the skillful use of radio broadcasting as a medium of communication and education. Radio forums are expected to deal with various aspects and problems of rural life and work, serving both social and agricultural education as well as political participation in the decision-making process. Programmes of radio forums feature agricultural news, interviews with successful farmers, talks with experts on new methods of farming, and so on.


28 Robert Chambers, op. cit., p. 236.

29 Ghana Planning Commission, *Seven-Year Development Plan, 1963/64-1969/70*, Accra, Ghana, March 16, 1964. According to the Nkrumah government, state and cooperative farming was to bring farmers a share of the local facilities they had so long been denied and also to have the opportunity to share in the up-to-date techniques of farming that should be employed in order to attain greater yields and diversity of crops. And that the interests of individual peasant farmers were not to be made subservient to those of the state farms and co-operatives (Kwame Nkrumah, President of the Republic of Ghana, 1960-1966; Speech by Osagyefo on launching of Seven-Year Development Plan, Wednesday, March 11, 1964, p. XV).


31 Robert Chambers, op. cit., p. 235.


33 Robert Chambers, op. cit., p. 235.


35 D.A.P. Butcher, op. cit., p. 4.

36 D. Paul Lumsden, op. cit., p. 130.

38 R.M. Lawson, op. cit., p. 103.


40 Jimoh Omo-Fadaka, "A Second Look at the Volta Project," West Africa, May 5, 1972, p. 556. According to Dr. Guy J. Lavoi-Pierre, "Worms and Volta," West Africa, December 25, 1972, p. 1714, bilharzia develops slowly in a person's body causing internal bleeding and damage to tissue, weakening the victim and making him/her liable to other and more serious sickness. A bite from a simulium fly leads to a transmission of tiny worms which, when they die in a person's (victim's) eye, create a fibrous substance which ultimately causes blindness.

41 Ibid., p. 555.

42 Ibid., p. 555. The steady flow of 20,000 cubic feet of water per second provides ideal conditions for the simulium fly, which thrives in fast moving waters. In 1956, when the Preparatory Commission of the VRP addressed the problem of possible ecological effects of the Volta Project, they assumed that the high incidence of simulium fly known to exist would be reduced or even eradicated. Their assumption was based on the fact that the simulium fly is known to be unable to withstand stagnant water. Therefore, it was concluded that the formation of a large mass of water such as Lake Volta would be unfavourable as a habitat for this insect vector (the simulium fly) for which, hitherto, the fast running Volta River had been a conducive environment. The Commission was also aware that the incidence of onchocerciasis might be influenced by the creation of a spillway to the dam and would act as a simulium breeding place unless it was designed so that at all rates of overflow of water there was a uniform current on the surface of the spillway. But even if the breeding of simulium should occur, in their view, it would not be difficult to control because of the availability of effective chemicals. Thus it was anticipated that the spillway could become a breeding place for the simulium. So that Omo-Fadaka's conclusion in his study of the effects of Lake Volta, that "the ecological consequences remain unevaluated," (Jimoh Omo-Fadaka, "A Second Look at the Volta Project," West Africa, May 5, 1972, p. 555) must be understood in the above light. (VRP Preparatory Commission's Report, London, HMSO, 1956, Part II, p. 200)
Ibid., p. 555. In fact, in 1956, the Preparatory Commission in their report predicted that the lake could become a source of bilharzia with which many immigrants were already infected.


Ibid., pp. 715-728.

Ibid., pp. 715-717.


Ibid., p. 1714.

Ibid., p. 1714.

Dr. B.B. Waddy, "Health Problems of Man-Made Lakes," Geographical Magazine, April, 1966, 38(12), p. 888. Note also that, in recent years, onchocerciasis in West Africa had attracted international attention. In 1974, following scientific reports on the disease, an international project intended to rid seven countries in the Volta Basin of this dangerous disease which has crippled more than a million people in a 700,000 square kilometer area involving parts of Benin, Ghana, Ivory Coast, Mali, Niger, Togo and Upper Volta, has proven successful. More than 70,000 inhabitants of the area have been completely blinded by this disease called river blindness because the tiny black fly (simulium damnosum) which carry the disease agent usually lays its eggs in fast moving sections of waters. The project which cost $20 million was financed by the World Bank, Canada, France, the Netherlands, Japan, United States of America and West Germany. (West Africa, January 1980, 101, p. 42)

Ghana, 1977, p. 35. The work involves studies on bilharzia, malaria, trypanosomiasis (sleeping sickness) and onchocerciasis. Examination of people in the Volta Basin areas for parasites in blood, skin, urine, stool and serologic tests are made continuously.


APPRAISAL OF THE VRP

Appraisal of the VRP here implies an evaluation of the VRP in terms of its assumptions and consequences.

The Assumptions of the VRP

The Government of Ghana saw the development of the Volta River Project as the key to the country's future economic prosperity for a number of reasons. It was assumed (i) that a large-scale aluminium industry in Ghana would be another major foreign currency earner (in addition to cocoa), which would reinforce the country's import capacity. The reinforcement of Ghana's export capacity had become particularly urgent owing to price fluctuations of cocoa on the world market; (ii) that availability of power would encourage the development of industry and commerce. These would give an impetus to industrialization of the country; (iii) that the project would generate economic growth in several sectors, directly through its subsidiary benefits such as fishing, inland water transportation, irrigation farming, and indirectly through the external economics of these subsidiary activities; (iv) that employment of Ghanaians during the period of construction and the period of operation of the
major components of this project (the power project, the smelter and mines and the ancillary facilities) meant acquisition of valuable industrial knowledge and skills as well as incomes for them; (v) that the combined effect of these economic gains, including their wide range of potentials, if and when developed, would lead to a diversified, and hence a strong, national economy, an increase in national incomes, and a rising standard of living. Finally, although the project would make its greatest impact on the localities immediately affected by its operation, its economic effect and social impact would, it was assumed, extend to all parts of the country eventually. The project was also to have its full impact within a twenty-year operation period, from 1957 to 1977, according to the original plan. At this point, it can be seen that the VRP was conceived as a developmental scheme intended to stimulate economic development and social change. The VRP was also seen as a multipurpose project because of its several derived advantages.

When the project was revised, however, a good deal of the impact envisaged was no longer realizable, because some of the components of this project were either dropped entirely (like the development of a new township for the smelter) or postponed (for example, aluminium production in Ghana using local bauxite). Also, some of the subsidiary benefits, such as the development of tourism, afforestation and wild game in the Volta Basin, still await their future development, while others like water
transportation, irrigation farming, and the fishing industry require further improvements. Nevertheless, all these have potentials for economic growth in the Volta Basin, although they were seen as long-term projects.

It can therefore be seen that, although the VRP is an unfinished project, this project has an enormous capacity to generate economic growth and hence bring about a considerable social progress, provided the various potentialities of the project can be effectively utilized. Whatever its present state and level of development, however, the VRP can be seen not only in regard to its immediate political and economic justification but also in regard to its long-term objectives for the social and economic development of Ghana.¹

In reviewing the consequences of the VRP, three main questions will be addressed. First, what has Ghana achieved from, and by, the VRP on both national and international levels? Second, was the project worth the national effort in terms of its economic and social benefits and in terms of its social costs? Finally, what are the major contributions of the VRP in the context of communication?

The Achievements of the VRP at the National Level

Economic and Social Benefits of the VRP

From the economic point of view, the availability of elec-
trical power made possible by the development of the VRP has engendered industrial development and enhanced commercial busi-
ness in southern Ghana. It was indicated that the provision of power alone had not been enough to stimulate industrialization in Ghana. Consequently, the VRP has not brought about an enormous economic development since electrical power is only one important and valuable contribution towards industrialization. Moreover, the use of the Akosombo power in industry and commerce and for domestic purposes is largely limited to urbanized southern Ghana, where most of Ghana's industrial establishments and factories are located, especially in the cities of Greater-Accra, Kumasi and Sekondi-Takoradi and major mining and forestry resource towns.

As areas with great industrial and commercial activities and demand for industrial knowledge and experience, commercial and administrative personnel and persons with all kinds of busi-
ness, profession and trade, they hold prospects for the estab-
lishment of new businesses. They also provide external econom-
ies (social and economic advantages) which are beneficial to new businesses. Concentration of the industrial and business build-
ups in the urban sector also mean imbalance in the distribution of industry and commerce between the urban and rural areas. It also means disparity between these areas in terms of social and economic progress generally, made possible by the provision of power as a means of industrial and social development.

The Volta scheme's aluminium industry, which was intended to reduce Ghana's dependence on cocoa as a major export, has not
been developed either by VALCO or the Government of Ghana. VALCO's unwillingness to embark upon an integrated aluminium industry in Ghana is largely attributed to the fact that, because Kaiser (with 90 per cent equity in VALCO) successfully negotiated a tax-free operation in Ghana for thirty years, VALCO has had no incentive to invest in bauxite mining or alumina production based on locally processed bauxite in the country. Moreover, because different firms are involved in VALCO, each is unwilling to commit resources for integrated aluminium development.² Finally, because of its other multinational interests, even though it was supposed to develop the local bauxite after ten years' operation, VALCO has had no desire to do so. In 1978, Kaiser sought to expand its multinational sectors in Australia because of the growing demand for aluminium in the world market,³ but had virtually done nothing about Ghana's bauxite development.

On the other hand, the great capital costs involved in this economic venture and the need for sufficient personnel with adequate knowledge and experience in this specialized field of production, like the aluminium industry, make it difficult for the government itself to undertake this venture.⁴ It can be said that, because so far VALCO has shown no strong desire towards the future exploitation of Ghana's bauxite, the aluminium industry in Ghana based on locally processed bauxite is a remote possibility.

Nonetheless, whatever the present situation, it can also be argued that because of her weak bargaining position during the
negotiations with VALCO in 1961, Ghana was unable to seek good business terms for the development of her aluminium industry to expand the country's weak economy. Moreover, the Government of Ghana had pressure to reach an agreement with a smelter company, like VALCO, which would consume a greater part of the Akosombo power before loans from the World Bank, the U.S., and so on, could be granted. It has already been emphasized that the development of the VRP largely depended on this fact - the fact that without a smelter to serve as a major market for the power, the VRP was not economically feasible. The Government of Ghana was therefore obliged to come to terms (favourable or unfavourable) with VALCO.

In conclusion, however, while VALCO has earned a substantial profit in the past ten years (about $100 million) due to cheap energy cost⁵ and several other concessions granted to the company, Ghana has had to wait until such time that she is in the position to exploit her bauxite. This means that VALCO's capital investment in Ghana since 1964 has failed to produce a significant impact on Ghanaian economy due to its failure or inability to assist in the development of Ghana's aluminium industry, which was an integral part of the VRP. But Nkrumah has pointed out that the VRP was accepted in principle by his government not only because it provided for establishment of a smelter that could consume much of the power, but it also provided for the production of a large and reliable source of power for many years to come for Ghana's development.⁶ Even so, it is now realized that
the Akosombo power is exhausted. However, the so-called enlightened business self-interest on the part of multinational business concerns makes the participation of multinational corporations, like VALCO, in the economic development of developing countries, like Ghana, a questionable proposition in future because of Ghana's experience with the VRP.

The VRP has created several other benefits in terms of water transportation, fishing and irrigation. But none of these is without some setbacks. The Volta transportation system is faced with an efficiency crisis because of poor facilities and irregular cargo and passenger traffic. While large-scale irrigation farming is planned for the production of crops like cotton, rice and tobacco, pilot and experimental schemes are being employed at the initial stages in order to ensure its ultimate success on a large scale. But Ghana's weak agriculture production for industrial raw material and foodstuffs since the colonial days and frequent food shortages, especially in the 1960's and 1970's, suggest the irrigation scheme must be taken very seriously if the country is to be in the position to meet its growing and great demand for food and industrial raw materials. And the fishing industry, which has so far proved to be a great means of gainful occupation for many thousands of Ghanaians, given impetus to boat-building industry, and has provided a market for the transport industry in the distribution of fish in the south, is threatened by disease like bilharzia and onchocerciasis, which restrict the fishing activity and lakeshore settlement.
Finally, the resettlement agriculture programme, which was seen as an opportunity to scientifically improve and commercially expand agriculture production in the Volta Basin, did not succeed, for reasons already given elsewhere.

It can be seen that the potentialities of the various economic benefits have not so far been fully utilized owing to some social and economic problems which have retarded their developments. But this is also due to the government's failure to mobilize the society around these issues.

From the social point of view, the VRP has improved the diet of many Ghanaians through the fish supplies. It has created jobs for many Ghanaians as well. By their work, these Ghanaians acquired knowledge and skill, but knowledge about industrialization and its benefits was limited to a small group of people in the privileged positions in Ghanaian society. And the availability of power, which was supposed to generate rapid industrial growth, was limited to the privileged few in urban southern Ghana. The settlers who were displaced by the creation of Volta Lake enjoyed a relatively improved standard of living as a result of the resettlement scheme and its agriculture programme. But they were not pleased about being coerced into using modern processes and techniques of farming. What could have suited the farmers who were mostly illiterate was encouragement in the use of modern methods of farming. They would have also appreciated it if these were re-interpreted to suit their ways as
far as possible. Moreover, there are housing and employment problems as a result of the industrialization and urbanization. But despite this, no one can doubt the many advantages of industrialization in terms of commodities and social services.

The VRP as an Instrument of Social Change and Modernization (in Terms of Processes and Techniques of Development)

(i) Development of Modern Townships

The VRP was seen as an instrument of social change and modernization. The development of Akosombo, the resettlement and Tema townships meant new settlement patterns in Ghana. The Tema and resettlement townships were expressions of the kind of new Ghana the government envisaged in the urban and rural Ghana. These townships were also reflections of western development pattern in that, as Lerner has advanced, this involves, first, physical transformation in terms of modern townships and infrastructure; secondly, urban growth as a result of industrialization; and finally, third, psychic mobility (empathy). The growth of Tema is largely due to the development of the VRP. Lerner has also stressed another important requirement in the process of urbanization which became evident in the resettlement township. This is the need for police. The settlers stressed the lack of a police post and pointed to the problem of disorderliness in some resettlement townships. As a community assumes
urban status, the problem of law and order becomes very significant. This was the case of the settlements.

(ii) **Agriculture Development**

In the agriculture field the use of the resettlement agriculture as a means of encouraging peasant farmers to adopt scientific and mechanized farming was another attempt towards modernization. This was meant to serve as a pattern of modern methods of farming for the rest of the country. Allocation of farming land in these resettlements was not by freehold but by lease on a contractual basis, which constituted a new kind of social and economic relation in regard to the use of productive resources, like land, labour and capital. Land, capital and labour all became saleable commodities. But because of inadequate preparation for the change in terms of social education and land reforms, the programme was bound to fail and, indeed, did fail. The settlers had several misgivings, as already stressed elsewhere, about the government's intention and approach to the resettlement and agriculture scheme. In this regard, too, Lerner's concept of empathy (psychological urge on the part of individuals to want to advance their social and economic position) was not evident among the settlers who, although induced to change their traditional patterns of living, did not respond. It was not enough for the peasant settler-farmer to become a modern and scientific farmer; he must both want to do so and have the ability and resources to become one. Like the principle of demand in economics, which implies demand backed by purchasing power, Lerner's concept of empathy must be seen to include
certain psychological, social, and economic requirements: a person must have the desire, the means, and the ability to pursue a particular goal in a given socio-economic set-up. To be a workable concept, therefore, "empathy" must not be an imaginary desire based on "psychological instinct", but an attainable desire based on realistic assumption. Otherwise, it must be seen as an utopian concept in the realm of social psychology. Finally, although the resettlement and agriculture scheme can be regarded as an index and instrument of change in that the scheme implied both structural change and diffusion of knowledge and skill in social and agricultural fields in the Volta Basin, because of its inability to promote viable commodities for which the scheme was designed, it merely passed as a symbol of modernization (token modernity) without any substantial improvement in the quality of the rural life.

(iii) The Provision of Electrical Power as an Aspect of Economic and Social Modernization in the Ghanaian Economy and Society

It has been indicated that the Volta Project was primarily an infrastructural development which was intended to provide hydroelectric power for industrial and other uses, though its immediate concern was for the production of aluminium. To this extent it can be argued that the VRP was part of Ghana's modernization process in that it provided power for the improvement in the process and techniques of industrial production and for the improvement in the social life of people in the Ghanaian society.
For instance, the provision of an energy surplus was expected to be a great attraction to industry and help to speed up the rate of economic modernization, especially in the industrial and commercial production. That is to say, that the availability of cheap electrical power over large areas of the country, especially in the south, would encourage the adoption of more modern equipment and techniques in both large-scale and small-scale businesses in Ghana. Socially, the coming of electricity would help to transform social life in many towns and villages. Agriculture would also benefit from the power supply.

The use of power has grown since the inception of Akosombo power. And, while prospects for potential use of power in various sectors cannot be denied, the use of electrical power, both in industrial and agricultural sectors, is limited by several factors, such as the volume of production, accessibility and cost of power, as well as ability to use power. For instance, agriculture is considered as a potential source of demand for electrical power. It can be used, for example, for cultivation and for the processing of farm products. But the application of electricity in agriculture involves scientific methods of farming and the use of capital intensive technology which are beyond the immediate reach of peasant farmers (who constitute the largest proportion of the farming community) unless accompanied by systematic training. With their small incomes, small-scale and labour-intensive farming, the use of electricity for farming, unless subsidized, would be uneconomical and so is unlikely to appeal to them.
And in the industrial sector, in addition to the cost of power and degree of mechanization, the extent to which electricity can be applied in an industry depends on the structure of the industry. This implies the extent to which a large part of the industry is power-intensive (capital-intensive). In electrochemical and electrometallurgical industries, for example, where electrical energy is an important raw material in that they consume a large quantity of power, apart from applying electricity as motive power, they may use it also for lighting and heating and as electrochemical reaction or process. The cost of electrical power as sold to an industrial consumer has therefore large effects on the energy-intensive industries (like the production of fertilizers, caustic soda and aluminium) and their development, since this may be as high as 15 to 30 per cent. Thus it can be seen that the use of electrical energy is influenced by factors which are economic, social and technical.

Nevertheless, the availability of power has enhanced industrial, commercial and agricultural development in the country. It has helped with improvement in the process and techniques of industrial production and in the domestic and commercial services. In a recent survey on "Indigenous Capitalism" in Ghana from 1968-1970, Paul Kennedy found that 68 per cent of the indigenous manufacturers had invested in power-driven machinery. It has also helped to improve social life generally, especially in the areas where there is an access to electricity supply. But in capital-intensive industry the use of power means less labour input as a factor of production. On the other hand, power-intensive industry
also implies a great deal of production efficiency. In sum, as a means of production, electrical power has many uses which, when and if utilized, can improve the quality of human life in Ghanaian society. It is in this context that VRP must be understood.

(iv) Unemployment and the Growth of Urban Slums

Migration to Tema and Akosombo townships, as well as the city of Accra, meant an increase in the number of unemployed Ghanaians in these areas. Because of housing problems, the growth of urban slums like Ashama in Tema and Medina in Accra was inevitable. The drift to towns was the outcome of improved communication between the Volta and Greater-Accra regions and between the north and south.

Social Costs

Health Problems

The Volta Lake came into existence as a result of the VRP. This lake, which now occupies nearly 4 per cent of Ghana's territory, has become a real and potential public liability. In order to maintain the lake as a healthy environment for the fishing industry, tourism, navigation and irrigation, the area requires frequent surveys of, and control projects for, mosquito and simulium, as well as health education programmes for the inhabitants of the Basin. It cost not less than 3 per cent of the total power sale each year for the lakeside health and safety maintenance and this may not be adequate to the task.

The formation of the lake has aggravated diseases like bilharzia, which used to be on the decline prior to that. This
has come about as a result of the ecological changes in the shores and basin of the lake. It has also revived diseases like onchocerciasis. When the lake was formed, the vector of this disease, the simulium fly, which does not thrive in stagnant water, was supposedly eradicated. But the lower Volta and the dam itself have become its new breeding grounds. These diseases endanger the lives of inhabitants of the Volta Basin and set limitations on their new-found and lucrative fishing activity.

**The Resettlement of the Displaced People**

The construction of the dam required the evacuation of about 80,000 inhabitants of the Volta Basin, bringing them considerable hardships. And because of the pressure of time, the settlers could not be grouped according to ethnic affinity, and also be provided with an adequate farm land on their arrival.

The VRP has also deprived these people of their land and land tenure system which constitute the basis of their territorial integrity and ethnic identity. Some of the settlers, who previously by customary rights had no land, obtained some; but some others who by custom and their tenure system had land, lost it. In the settlements, allocation of land was based on new criteria, irrespective of one's previous rights and privileges.

It caused permanent migration of many of the inhabitants who could not cope with the new system. Some lost permanently
their ancestral shrines which had been the focus of their spiritual life. This loss meant emotional uncertainty in their lives because of the fear of ancestral retribution. It also implied that economic measures in modernizing Ghana took precedence over emotional concerns.

However, in the final analysis, the VRP on the national level was largely concerned with the development of an infrastructure for industrialization. This consisted basically of the development of power, as power is one of the key features of economic development. However, in addition to the development of power, there are other factors which are equally important in economic development; factors such as the training of high and medium-level manpower for both industrial and administrative services and the development of a comprehensive network of communication to ensure adequate and efficient flow of information between the ruling and the ruled, urban and rural areas, more developed and less developed regions, and between literate and illiterate people. Since the development of the VRP was meant to primarily provide electrical power, its main objective has been accomplished. In addition, power alone can not be used as a yardstick to determine a country's development and so the VRP must not be seen as such. And, although in terms of Ghana's energy requirements, the Akosombo power has proved inadequate, it has helped enormously to reduce the country's dependence on thermal energy. Moreover, with the present high costs of oil on the world market and since Ghana has no known coal deposits, the
importance of the Akosombo power can be highly appreciated. In this sense, Ghana's energy diversification policy since the 1950's has proved to be economically and socially sensible.

At the International Level

Internationally, Ghana benefitted from the development of the Volta project in three main ways. First, it was a source of financial capital. Ghana obtained half (£35 million) of the VRP's investment capital (£70 million) through international loans (see Table IV). The construction of the aluminium smelter also brought in an additional foreign private capital investment of £58.6 million, bringing the total external investment to £93.6 million. Apart from financial capital, Ghana benefitted from the knowledge and experience of the west through the development of the VRP and the building of the smelter. The smelter became the major source of market for the Akosombo power and it was also intended to ultimately provide a base for an integrated aluminium production in Ghana based on locally processed bauxite.

On the other hand, as an international development project, the VRP has not so far been able to substantially provide the underpinnings of Ghana's weak economy for which it was intended. Consequently, the contribution of the VRP towards the raising of Ghana's standard of living has been minimal. This can be explained in two ways.
### TABLE IV

**SOURCES OF EXTERNAL LOANS FOR GHANA'S VOLTA RIVER PROJECT**

<table>
<thead>
<tr>
<th>Source</th>
<th>Amount</th>
<th>Interest Rate p.a.</th>
<th>Total Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Bank for Reconstruction and Development (IBRD)</td>
<td>£16,790,000</td>
<td>53/4%, 25 yrs.</td>
<td>£40,296,000</td>
</tr>
<tr>
<td>Agency for International Development of the United States Government (AID)</td>
<td>£9,640,000</td>
<td>3 1/2%, 25 yrs.</td>
<td>£23,136,000</td>
</tr>
<tr>
<td>Export-Import Bank of the United States Government (EX-IM)</td>
<td>£3,570,000</td>
<td>53/4%, 25 yrs.</td>
<td>£8,568,000</td>
</tr>
<tr>
<td>United Kingdom Board of Trade acting through the Export Credits Guarantee Department (U.K.) ECGD</td>
<td>£5,000</td>
<td>6%, 25 yrs.</td>
<td>£12,000,000</td>
</tr>
</tbody>
</table>

**Total**

£35,000,000

£84,000,000

**Sources:**


First, instead of helping Ghana with the planning and development of the VRP's subsidiary benefits which, when and if developed, would ultimately benefit many Ghanaians at both the national and local levels, the government of the United States of America was more concerned with seeking assurances of good political behaviour from the Nkrumah regime, domestically and externally in 1961, before the loans Ghana required could be granted. By doing so, the government of the United States of America made the financing of the VRP an ideological issue. But the United States of America, under the Kennedy administration, failed to realize that the success or failure of its ideological campaign in Ghana depended to a large extent on the value of the contribution to be made by U.S. economic assistance towards Ghana's economic development.

Second, the U.S. was also more concerned about the business arrangement of the VRP's economic venture, such as the legal and administrative implications of the development of the VRP at national and international levels than helping Ghana to find ways and means to deal with a more fundamental question of local participation in order to ensure effective utilization of the benefits of the project. Both the agreement and construction of the VRP were subjected to rigorous legal and administrative scrutiny in order to ensure that the project was legally well protected and efficiently managed during the period of construction as well as operation.

Although the rigid construction timetable set for the VRP
helped to reduce the cost of the VRP, it also brought pressure to bear on the development of the resettlement and agriculture scheme for the displaced people. The planning and execution of this programme could not be adequately investigated through feasibility and survey studies at the local level. Thus, it can be said that the local interests were either taken for granted or ignored because of the pressures at the national and international levels during the negotiations and the signing of the financial agreement.

Similarly, while administrative conditions set for the operation and management of the Volta River Authority (VRA) made the organization relatively efficient, they also denied Ghana the right to manage its own affairs. Thus, the VRA became an administrative satellite for a multinational business interest. After all, the U.S. idea of international development implied self-help and local initiative and involvement of foreign companies in the development and planning of development schemes. And in the final analysis the success or failure of the VRP rested with Ghana.

But since the ultimate goal of international development is to improve the living conditions of the poor and underprivileged at both local and national levels, it was necessary for the participants in international development to make sure the international development project would achieve its basic objectives. Thus, if international development effort is to have any meaning at all to both developing and developed countries, the success or failure of international development projects should be a joint
responsibility of their participants at both national and international levels. Otherwise, as a means of reducing world poverty and thereby bringing about the so-called world peace, international development can not make significant and valuable contribution, let alone serve as an effective international communication mechanism.

VRP's Social and Economic Gains

The benefits so far derived, and yet to be derived, from the VRP indicate that the project's development was worth the national effort. As an infrastructural development, the VRP has provided Ghana with power for industrialization and other uses. The VRP was also seen as an integrated economic development programme for the less-developed Volta Basin. It was assumed that the development of the VRP could bring about economic growth and social change, first, through the planned settlements and agriculture for the displaced inhabitants of the Volta Basin, and second, through the development of fishing industry, water transportation and irrigation farming in the Accra and Afram Plains, which were also considered as potential sources of economic growth. But the successes and failures of these schemes in the Volta Basin have been attributed to diverse factors which have already been discussed.

On the other hand, the VRP has produced an array of side-effects. The development of the VRP gave rise to health problems, like the growth of diseases, though these appear to be
under control; it brought hardships to the displaced people, but they also enjoyed certain benefits in return; unemployment has been the effect of industrial and urban growth in Greater Accra due to the influx of people from other regions to this place for various reasons. This poses a political problem for the government because of its social and economic implications. Finally, the already existing development imbalance between the sub-regions of northern and southern Ghana and between Greater Accra and other southern regions, like central and eastern, is susceptible to political interpretation if this is not gradually alleviated. In sum, while a good deal of these problems can be, and are being, accommodated, the Government of Ghana must take a more comprehensive approach towards the utilization of the economic benefits, and the continuous remedy of the social effects, of the VRP.

Communication and the VRP

In terms of communication, the development of the VRP has had several ramifications in Ghana. First, it has heightened the national consciousness of Ghanaians about large-scale economic development. The development of cheaper means of transportation by a network of inland communications has strengthened the physical contact between the south and the north, Volta and Greater-Accra regions, and within the Volta Basin itself. This meant a great deal of social and economic relations through trade and migration.
Internationally, it has strengthened the trade and communication links between Ghana and her neighbours like Togo, Benin, Upper Volta and Niger, with whom Ghana has had a long history in trade relations, especially in cattle and migrant labour.

Regional Relations as an Aspect of Communication

Second, the VRP reinforced the existing regional imbalance between north and south and between coastal and central regions in the diffusion of industrial development and in investment and job opportunities that go with them. The inland communication link between the industrializing Greater-Accra and agricultural northern regions implied a centre-periphery relationship. The industrial sector in the southern region has become both a pull-and-push factor. As the pull factor, the industrial sector had demand for agricultural products, especially food and industrial raw materials, like cotton, peanuts, as well as unskilled and semi-skilled labour for industrial and mining work. As the push factor, it also meant the movement of industrial and consumable commodities to the north. Also between the coastal and central regions there is a great disparity in terms of industrial development and urbanization. While in the coastal sub-region there are highly industrialized centres like Accra, Tema and Takoradi, in the central sub-region, only Kumasi has a measure of industrial growth.
Third, in the diffusion of the VRP's benefits, urban areas in southern Ghana gained more than the rural areas. The construction of the smelter in Tema, instead of rural Kpong, only reinforced the growth of population, commerce and industry of that town. The domestic and industrial uses of Volta's power and employment opportunities were limited to the urbanized southern Ghana.

Employment opportunities and social mobility were limited in the Ghanaian society to the already dominant class of individuals and groups who had the ability and capacity to utilize employment and investment opportunities created by this project.
NOTES

1Kwame Nkrumah, Revolutionary Path (London: PANAF, 1973), p. 384. Before Nkrumah departed in 1966, he noted that the completion of the VRP was a positive break-through in Ghana's agricultural and industrial revolution because the VRP provided the electrical power for Ghana's social, agricultural and industrialization programme.

2F.E. Ian Hamilton, "Aluminium is Power," Geographical Magazine, June, 1979, LI, pp. 598-600. Note that the signing of the agreement of the VRP in 1959 contained no commitment for the establishment of a plant to convert locally mined bauxite into alumina. This was, however, a major departure from the original conception of the VRP. The scheme as recommended by the Preparatory Commission included a bauxite mine and alumina plant.

3See Appendix


CHAPTER VIII

CONCLUSIONS

Communication in this discussion is used in two senses. First, it is used to imply the role of communication in economic development and, second, it is also used to depict the development of the VRP as a form of communication, both as seen by countries and institutions involved in the Project and in the context of international development.

The Implications of Development Communication Theory for the Development of the VRP

In order to ensure effective economic development, an adequate flow of information was vital. This required not only the development of information media to the required level, but also access to, and effective use of, media. But because of the origins and top-down approach to the development of the VRP, one-way communication resulted, in which the government officials sought to inform and explain the objectives and the benefits of the project to a large group of people, and to persuade them to accept it. However, this study has shown that multi-purpose communication was needed in this kind of project, in which cooperation, understanding and optimum participation of a good number of people is required.

It is the conclusion of this study that if the government had endeavoured to encourage local participation in the project,
at different levels of its implementation through the use of an effective system of communication, many of the problems encountered could have been avoided or been effectively contained.

Some bottom-up communication was used regarding the social welfare aspect of the scheme and for this reason it was relatively successful. A series of surveys were made and various discussions were held with the settlers regarding resettlement groupings, site selections, choosing resettlement or compensation, the provisions of new houses and better services, and a host of other matters. These actions were taken to seek local views and opinions about the issues involved in the evacuation exercise and to explain the part the settlers were expected to play.

A case in point is the selection of sites for the resettlements. It is said that when the site selected by the people was not acceptable to the VRA for technical reasons, such as lack of access roads, lack of water, poor soil or inadequate agricultural land to sustain the population, the officials had to resort to all forms of contacts to persuade the people to accept an alternative site. The techniques employed included the use of mass education campaign to demonstrate the benefits the people would derive from accepting the VRA's site and the use of the social welfare staff to explain things to them as well as the local influence such as the district commissioner, the regional commissioner, the chiefs, and so on, to persuade the people to compromise. Out of 101 sites that were selected throughout the Volta
Basin, 21 were rejected and 52 were accepted through discussion and persuasion. This is no doubt a clear case for seeking understanding and cooperation in decision-making processes.

Town Development Committees served as further channels of communication. They were interim organs which dealt with resettlement questions, administration, and so on, during the execution of the resettlement programme. Contacts were also established through the local chiefs, headmen, district commissioners, regional commissioners, members of Parliament, clerks of council and other persons of influence.

However, no advisory bodies were established at local levels to serve as direct communication links between the authorities and the people. Establishment of consultative advisory bodies, in addition to using other forms of contact and channels of communication, would have been an ideal policy for two main reasons. First, it would have ensured a continuity of policy between people and the government. Second, in addition to being a vehicle for local opinion and a source of information, it would have served as a medium of influence to reach out to the settlers. Better understanding over issues could also have resulted. For example, local farmers' council to serve as a co-ordinating organ for the planned agriculture would have been a good starting point to win the confidence of the peasant farmers in the running of the programme; while local authorities would have dealt with general local matters. It must be stressed that the lack of local authorities of this kind created a vacuum when the Town Development Committees were ultimately
dissolved since there were no bodies to deal with problems of sanitation, civil disorder and matters at the governmental level.

At the government level, the establishment of a Working Party which handled the overall resettlement policy during both planning and execution of the scheme served as a link between the local people and the VRA. Unlike the Town Development Committees, there were no local representatives on the Working Party. It consisted mainly of experts, such as social workers, physical and regional planning experts, surveyors, agriculturalists, and so on.

The government used a top-down approach to the agricultural programme. The government felt that the settlers required a change in their approach to farming and so introduced modern methods of farming. But partly because of the government's inability to provide adequate farming land ready before the arrival of many settlers, and partly because of imposition of certain disciplinary measures regarding the planned farming, many settlers became suspicious about the intentions of the government's agriculture policy. Many of the settlers felt that despite the government's declared policy that nobody should be worse off than before as a result of the VRP, the government was not doing enough to assist them in making a living. The paternalistic attitude of the government also gave rise to apathy and dependency on the part of many settlers. Settlers who did not obtain land on their arrival became disgruntled. These
problems could have been avoided through the use of effective channels of communication. The government could have explained to the settlers the problems of economic development through an effective use of the media and other channels of communication. In particular, they could have explained that its inability to supply adequate farmland was due to the pressure of time and the lack of machinery. In addition to these technical difficulties, the resettlement agriculture required a sudden switch from traditional shifting cultivation to stabilized agriculture. The peasant farmers had to be taught a new system of farming which required new values, attitudes, discipline, organization and management effort, as well as capital and expertise. Indeed, because it involved the use of specialized inputs like fertilizers, insecticides, new seeds, machinery and equipment, and so on, it required a professional farmer with a scientific mind and technical skills, or at least, a farmer with clinical experience in modern methods of farming. In addition, a country like Ghana, where by custom and tradition land is not a saleable commodity, there was the need to ensure an easy and ready access to the use of land for farming. All these problems called for political and social education; the giving of technical assistance and moral encouragement, as well as the cooperation of the people. And these all required effective communication. But this was either non-existent or inadequate where any attempt was made.
It can be argued that the government's resettlement agriculture failed to gain the necessary understanding and support it required because of the lack of attention given to the role of communication in its implementation. The government failed to realize, or underrated, the fact that agriculture development is an organization and development effort which requires not only the right kind of technology to meet the needs and to suit the conditions of a given environment, but also requires an effective means of communication to teach the peasant farmers how to use the technology.

Similarly, the resettlement housing became another source of misunderstanding. Some of the issues that emerged, such as the building of unauthorized structures, could have been avoided had the government taken the trouble to explain the housing policy to the settlers and had they been consulted regarding suitable housing. It became apparent that there were no guidelines regarding the manner in which the settlers could expand their core houses, although the settlers were expected to develop them on their own. And even though they were required to seek official approval before they could expand their core houses, there was no clear-cut avenue through which settlers could readily obtain permission. A permanent Town Development Committee with legal powers to oversee such problems as sanitation, provision of additional facilities, and the overall development of the settlement townships was necessary.

All these problems suggest an effective system of communication by which information could flow to and from the people
was lacking. As far as passing information on from the government to the people is concerned, a carefully planned media campaign could have been implemented. An integrated approach, utilizing mass media such as radio and television (say, for documentary films) as well as exhibitions, public talks and interpersonal communications, could have been used. Such an effort could have helped mould people's opinion and influence their attitudes and beliefs. It would have helped to promote new values and aspirations. And it would have made clear the VRP's development problems and benefits.

In particular, radio forums like those now in existence, which usually feature various aspects and problems of rural life and work, could have been used effectively, particularly with regard to handling crash programmes of economic, political and social nature.

Radio forums were launched in 1964/65 at the time when the resettlement exercise was at its peak. But it is not known whether they were ever used during the implementation of the Volta resettlement scheme to explain and educate the rural public on the objectives and benefits as well as the problems of the VRP.

As far as communication from people to government is concerned, information-gathering devices like public opinion polls, surveys, interviews, and questionnaires could have been used.

In conclusion, the success or failure of the VRP depended not only upon the opportunities created by the project, but also upon the attitudes and receptivity of the people towards these
opportunities. This depended on the people fully understanding the VRP in terms of its objectives, problems, possible solutions, and so on. The analysis of this project has demonstrated that, unless accompanied by effective channels of communication, development projects like the VRP cannot by themselves bring about successful social change.

The role of mass communication in economic development has been criticised in terms of its assumptions, impact and pattern of communication since the 1970's. The assumption that mass communication is a powerful instrument able to directly lead a mass audience through persuasive messages about development issues is an exaggeration. It is now known that the relative power of mass communication to facilitate development is only indirect and contributory, rather than direct and powerful. The next assumption that the impact of the mass media is widespread and direct is another exaggeration: access to the media in terms of usage is heavily influenced by social and economic factors (such as literacy and income). And, in terms of the credibility of the media, it was assumed that they were universally forceful and readily acceptable. But it is now seen that the impact of mass communication is both internally and externally mediated and constrained by several political and technical variables. Thus, the impact of the media on development in terms of their reach and credibility, can not be taken for granted. The pattern of communication was seen as a one-way, hierarchical flow of information from top of the social system
downwards to the bottom. Government officials sought to inform and persuade a large audience of different publics. It is now claimed by communication scholars that two-way flow of information and multipurpose system of communication should be promoted. This is required by local participation in the decision-making process in projects as well as independent and critical feedback. In spite of these criticisms, mass communication is still regarded as an important instrument for economic development. It can speed and ease social transformation by the mobilization of human resources behind national effort and through the flow of information vital to development in order to regulate different levels of social tension and inculcate into people new values, beliefs and ideas. But unless political and technical barriers to communication are either eliminated or effectively contained, the ultimate role of the media will be counter-productive to development. People's expectations will end in frustrations.

The Implications of International Development Theory for the Development of the VRP

In the context of Western development theory, development implies economic growth, which requires industrialization. The VRP was seen in this light as instrumental in the economic growth and modernization (in the sense of structural transformation of the social and economic base) of Ghana.
Industrialization requires modernized agriculture and industry. Without an improved agriculture, industrial growth would be retarded since industry depends on an agricultural base for market (because improved agriculture means high productivity and hence rising incomes, which also means a strong purchasing power and consequently effective demand), "surplus labour" (in the sense of dynamic decrease in labour force on land as a result of improved methods of agriculture), and raw materials. On the other hand, agriculture depends on industry as a source of industrial products and market. Thus the growth of one means the growth of the other. And since industrialization as a precondition requires modernization (structural transformation) of the economic and social system, modernization was seen as a prerequisite for economic development, and hence, development generally.

Closely associated with this development concept was the role of the state. It was generally thought that in the transitional development period the government should do two things. First, the government should provide the basic infrastructure (for example, power) in order to enhance economic activity generally; and second, the government should plan economic development in certain vital areas. The provision of infrastructure was intended to encourage different economic interests to participate in national development according to their initiative, ability, and within given socio-economic and political
constraints. The provision of an infrastructure was based on the principle of inducement, which implies the creation of a conducive economic climate for economic activity.

On the other hand, economic development was to be planned because price mechanisms were considered ineffective in a low income economy. In a developing economy, like that of Ghana, economic growth could be generated through an injection of investment capital and technology into a sector or region which had economic potential. Nevertheless, development was generally seen as an individual or group affair, which has always been a characteristic feature of the western concept of development. The VRP was therefore intended to generate economic development and social change.

In the context of this theory, the VRP was intended to achieve two main things. First, it was intended to modernize Ghana's economic power base; and second, it was seen as an opportunity to initiate a revolution in the country's agricultural system as well as in social conditions in the rural areas. The other benefits such as irrigation farming and lake fishing were seen as potential sources of economic growth in the Volta Basin, while the inland transportation system would strengthen the transportation systems in the Volta Basin and between northern and southern sub-regions of Ghana.

From the analysis of the effects of the VRP, it was seen that the availability of power has encouraged industrial and commercial growth in the country, although, owing to certain political, economic and social problems, industrialization and
economic development have generally been modest since the inception of this project. And while other problems have arisen or been aggravated due to the development of the VRP, some of the effects of this project have been advantageous.

To ensure its ultimate success, the VRP still requires, in addition to optimum participation of Ghanaians, large inputs of Ghana's scarcest resources: foreign exchange, capital, modern knowledge and skills. It was not enough to have used a substantial part of Ghana's resources for the VRP's development without also ensuring that its potentials would be further developed to meet the needs of the country. Economic development implies not only a country's desire to develop its productive resources, as was done in the VRP, but also its ability and capacity to creatively use these resources for further economic development. It was not that there were no plans for the utilization of these resources. Rather, since the completion of this project, several attempts have been made to utilize some of the benefits of the project, though several socio-economic problems have militated against some of these attempts.

It was assumed that this project would generate further economic development by inducing individuals and groups to take advantage of it. But since the VRP's development policy was designed not with the people but for the people, this assumption was not realistic. This was a top-down project, centralized, and technically dominated. It demonstrates how easy it is to undertake capital intensive project development but how difficult it is to deal with the social and communication aspects.
Many Ghanaians required public education and socialization in order to benefit from these economic opportunities. This suggests that communication has an important role to play in economic development.

The VRP was a "symbolic" expression of western ideas of economic development in the 1950's. It was based on the premise that economic changes would generate social change. And that western science and technology, as an instrument of economic development, was relatively neutral in its application, despite differences in culture between the western and non-western societies.

In theory, the development of the VRP meant the injection of capital, technical skill and infrastructure into a relatively low-income economy, like that of Ghana, naturally endowed with resources but economically poor in these factors, in order to generate economic growth. This in turn was to spark off social change predicated upon the development of potentially productive resources of the economy. In practice, the VRP was based on export-oriented raw material development in Ghana with a priority to meet the raw material requirement of metropolitan United Kingdom industry, and to indirectly add to the export capacity of the colonial economy of Ghana. The development of productive resources with export potential, like Ghana's aluminium industry, was first to serve the British aluminium market and then to generate economic growth in Ghana. In addition, the
VRP had several advantages as infrastructural development that went with it, which in turn was to bring about social change and thereby lead, supposedly, to national development. In principle, therefore, the VRP implied using exogenous factors of capital investment and technology to stimulate an endogenous process of economic growth and social change.

Thus, the VRP was not expected to bring about an enormous national development, given the fact that this project was a single project. As such, the VRP was narrow in scope, and the benefits derived from it were not only limited to a few areas but were also slowly diffused into the Ghanaian economy.

The diffusion of the benefits was based on the notion that the opportunities created by this project would trickle down, which was a characteristic of the 1950's western economic thinking. The opportunities were expected to induce people to take advantage of them. Besides, the idea was to avoid the problem of distribution of these opportunities due to many limitations. But socially, in addition to differences in motivation, aspiration and ability of economic and social interests to take initiative and risks, the diffusion of the benefits implied the knowledge that such opportunities existed and were accessible to many people; economically, it also depended largely upon availability of capital, market, knowledge and skill. So that, by these implications, the effective utilization of the benefits of this project depended not only upon social and economic
factors, but also political action to ensure participation of an optimum section of the Ghanaian society, especially people in the Volta Basin. It is in this regard that communication has an important role to play in the process of economic development, but it was seen that this was lacking in the VRP's development.

At the national level, the VRP was originally conceived as a colonial export development scheme, designed to meet the needs of the metropolitan aluminium market, which the Convention People's Party (CPP) administration capitalized upon and re-interpreted to suit its economic policy and political ambitions. As the CPP government's economic policy, the VRP was sold to the people of Ghana as a "package" deal. The VRP was the Government of Ghana's effort to develop the less-developed Volta Basin and to initiate Ghana's industrial development and agricultural revolution. However, designed primarily to meet Ghana's energy requirements, other benefits being only by-products, little or no regard was given to the implementation of the subsidiary benefits and their socioeconomic implications. This reinforced the neo-classical economic notion that the government should create a favourable economic climate, especially in the field of infrastructure and social services, to serve as inducement for people to invest in their own fields of economic endeavours.

The VRP produced many opportunities which could have been utilized to generate economic growth in several areas,
but the supply of adequate capital, knowledge and skill, technology and the lack of adequate local response to some of the opportunities were seen as major constraints on their development. And as an international development project, the VRP only succeeded in meeting the energy requirements of multinational corporations, like VALCO, which operates as an economic enclave in Ghanaian economy. Apart from serving as a major market for the Akosombo power and offering employment for a few Ghanaians, VALCO has no significant linkages with Ghana's economy. Consequently, it has not generated any substantial economic growth in Ghana since 1967. Nonetheless, the VRP has improved the living conditions of many Ghanaians through the flow of proteins and electricity supplies in limited areas in the south. The inland water transportation of the VRP has also enhanced the flow of resources and provided access to real and potential marketing points within the Volta Basin and between the south and the north.

In the context of communication and development, the government's inability to provide settlers with a systematic programme based on an effective system of communication and education in the period of transition from subsistence to settled agriculture implied that the government failed to explain well in advance its resettlement and agriculture policy to the settlers. This made them suspect the real intention of the government regarding the scheme. The scheme itself did mean revolutionary change in agriculture. And under Nkrumah's "repressive" regime, little scope was allowed for public criticisms. It undoubtedly created
a psychological vacuum regarding the government's ability to provide a sound basis for scientific and commercial farming, especially given the fact that the government was unable to immediately impress the settlers by making readily available adequate farmland for commercial agriculture. The problem was compounded by the lack of capital on the part of the settlers, and the lack of adequate and efficient agriculture personnel, equipment, and so on, on the part of the government for the implementation of the programme.

Thus, the settlers were bound to have misgivings about the whole programme, especially about the government's commitment to effectively deal with their various problems; they were bound to have regrets for having had to leave their traditional environment to which they were psychologically and socio-economically attached for many years; and finally, they would also undoubtedly realize what problems are involved in economic development in modern times. All these became real and potential sources of conflict and tension.

These various problems suggest that an effective communication was desirable for both the planning and implementation of the scheme. But, apart from a brief nation-wide public relations campaign as yet not evaluated carried out to publicize the project, there was no plan to deal with the question of communication and social education at the local level in regard to the planning and implementation of the VRP. Therefore, as a national development programme, many of the setbacks could be explained in terms of development and communication.
The government's inability or failure to educate people at both the local and national levels on the socioeconomic implications of the project to ensure an effective utilization of the VRP's benefits can be seen as such. Communication has an important role to play in economic development, especially in "planned" modernization and "induced" social change, as was done in the VRP's resettlement and agricultural scheme. The development of Volta Lake as a means of transportation also implied an expansion of a network of communications between the south and the north and within the Volta Basin itself. In addition to enhancing the flow of resources and movement of people to and fro within the Volta Basin and between the south and the north, the inland water transportation has heightened geo-politically regional and national consciousness within the Basin and between the developed and less-developed southern and northern sub-regions. Also, the transmission system in the south for distribution of power constitutes another means of public utility for various uses. An effective system of communication can contain conflicts in the process of economic development through the creation of common grounds for understanding and appreciation of development problems and their possible solutions. Similarly, an effective system of transport and communication will ensure an efficient flow of resources and services as well as movement of people in the course of their socioeconomic endeavours.
The VRP in the Context of International Development and Communication

At the international level the VRP was an instrument of communication in that it involved not only the explicit transfer of resources consisting of investment capital, market, technical knowledge and skill, and so on, but also the implicit transfer of political and ideological interests of those concerned. During the negotiations, both in the 1950's and in the 1960's, the Government of Ghana and the Western interests involved in the development of the VRP were particularly concerned with the business, political and ideological implications of this international development project. International development involves different levels of communication. At the national level, economic and social ramifications of the VRP were prominent, while at the international level, economic, political and ideological implications were dominant. Thus, as an instrument of communication, international development was differently understood and appreciated by all those concerned and affected.

As an international project, the development of the VRP has demonstrated that though Ghana and the west had their specific and fundamental differences in ideology, beliefs and values, they had common grounds for international development. They all shared the belief that poverty in the Third World was a threat to world peace and that through international development cooperation this could be gradually reduced, if not completely eliminated.
While Ghana saw its relationship with the west as a business partnership, with political undertones, the west saw its relationship as a political one with business undertones in this economic venture. They all viewed international development as an effort towards peace, but they were motivated by different concerns and with different biases. Ghana had a dual ambition of economic development at home and political unity in the new Africa. The U.S. wanted to be sure Ghana's leadership in the new Africa was not harmful to western interests.

They disagreed on political ideology. Ghana under Nkrumah and the CPP administration became anti-capitalist by 1961. The government eventually considered capitalism unsuitable for, and incompatible with, the country's socioeconomic development because of Ghana's egalitarian system as well as the government's accelerated economic development policy. Capitalism as an economic system was seen as individualistic and as a political system it was considered too complex, liberal and superfluous. On the other hand, the government did not favour communism as an alternative system because of its ideological implications such as denial of freedom of religion and other forms of socioeconomic restriction. But Ghana had to do business with capitalist countries, as she badly needed western assistance in her VRP. The U.S. was in disagreement with Ghana's socialist tendency but felt obliged to aid Ghana. The U.S.'s refusal to do so would have had political implications for both Ghana and the rest of Africa, having in 1956 denied Egypt any economic aid.
The western involvement in the VRP was a means of helping Ghana to provide economic underpinnings of the country's economy with the view to bringing about economic growth and hence ensuring political stability in post-independent Ghana. But the West's contribution towards Ghana's economic development initiated by the VRP did not succeed in alleviating political instability in that country, as events since February, 1966 have shown. And the fact that Ghana has not significantly departed from the western political and ideological system since the overthrow of the Nkrumah regime cannot largely be attributed to the successes of western diplomatic effort in Ghana through whatever means, including their participation in the VRP. I suggest that Ghana's experiences since 1966 must be understood in a wider context. I will also add that the concept of international development supported by institutions like the World Bank, U.S. AID, CIDA and U.N. Specialized Agencies cannot bring about any substantial progress in the Third World because international development projects are only meant to support local initiatives and development efforts in the Third World countries, like Ghana, but not to supplant them.

The western strategy for international development will have to be seen to imply that local initiative, participation and self-help must be emphasized in planning and implementation of international development projects. And that the burden of international development must be shifted to multi-lateral arrangements, involving different countries and organizations such as the World Bank, U.N. Specialized Agencies and multi-
national corporations, if and where possible, so that the costs, problems and interests involved can be shared among participant countries and organizations. In this sense, international development can be seen largely as functional, designed to reduce the political sensitivity which is often associated with bilateral arrangements of foreign assistance, while attempting to achieve specific interests and objectives. But the western approach to the VRP could not pass this test because the west, especially the U.S., allowed political considerations to nearly ruin the western participation in Ghana's VRP. But the involvement of international organizations like the World Bank was not devoid of political considerations, nor certain business conditions, such as economic viability of the VRP and distribution of the project's benefits in the Ghanaian society which, in the view of the Bank, must be seen to benefit an optimum section of the population.

The VRP has shown that development means something more than economic growth. It has also shown that the involvement and initiative of the government in economic development without a political commitment to the people at the local level are not enough guarantees to help break the economic underdevelopment. While massive capital investment may be necessary to develop the productive capacity of an economy, several other additional inputs may be required to ensure further economic development is both internal and external, social and economic, as well as political and technical.
The VRP has demonstrated that the western concept of development in the 1950's implied that economic growth is fundamental as a basis of social progress because economic growth engenders structural change which, in turn, creates a climate for development generally. To develop, a country must industrialize because industrialization means economic growth. But industrialization cannot be effected without modernization (structural transformation) in the country's socio-economic system, using modern science and technology which must be accompanied by an effective system of communication as an instrument of change. Effective system of communication implies not only the use of available and improvised channels of communication, but also the taking of social-structural measures that would help remove barriers to communication in a given situation. The VRP was well conceived but in the planning and implementation of the project too much emphasis was laid on the national and international interests. Consequently, the local interests were ignored or taken for granted (i.e. at the local level, the people as a factor were taken for granted in the planning and implementation of the VRP).

The success or failure of development projects like the VRP depends not only on economic, but also on social factors. It is in this light that communication has an important role to play in development. Second, industrialization programmes cannot succeed without a revolutionized agriculture. A revolutionized agriculture was seen as a prerequisite for industrialization
programmes because urban and industrial sectors depend on agriculture for food and raw material, market and 'surplus' labour. And only an efficient agriculture system can provide these.
APPENDIX I

PROSPECTS FOR GHANA'S ALUMINIUM INDUSTRY
APPENDIX I

PROSPECTS FOR GHANA'S ALUMINIUM INDUSTRY

In 1966, Tony Killick suggested three main reasons why Kaiser, with greater equity share in VALCO, would not be prompted to develop the local bauxite and alumina plant in Ghana. First, unless the state of the world market is very optimistic, Kaiser would not undertake the exploitation of Ghana's bauxite. Second, any decision on the part of Kaiser to go ahead with the development of the local bauxite would be considered in relation to Kaiser's overall development in the world-wide aluminium business, and finally, Kaiser would take into account whether the climate in Ghana was right for investment, especially regarding political stability in the country. But he also noted that if the power price had been above a certain figure, a smelter would have been an economic proposition only on the basis of alumina produced from local bauxite. Thus, the fixing of the price of power for 30 years deprived Ghana of the main means it could have had of bringing pressure to bear on VALCO to install an alumina plant. (Tony Killick, "The Volta Project," in Walter Birmingham, I. Neustdlt and E.N. Amaboe, eds. A Study of Contemporary Ghana (Evanston: 1966) 1, p. 403)

Apart from political instability in Ghana since February, 1966, demand for aluminium in the world market has been relatively high. According to Ian Hamilton, the world output
of aluminium has risen from 1,650,000 tons in 1950 to almost 15,000,000 tons today (F.E. Ian Hamilton, "Aluminium is Power," Geographical Magazine, June 1979, Vol. L1:9:593). In 1978, Kaiser itself predicted a great expansion in the world's aluminium industry and planned to increase its own production capacity in Australia to 225,000 tons per year at the cost of 160 million. But no mention was made of plans to develop Ghana's aluminium industry (James Vais (Director of Economic and Marketing Research, Kaiser Aluminium and Chemical Corporation), "Prospect for Aluminium: 'Aluminium Squeeze,'" West Africa, November 13, 1978, p. 2250). Thus, Ghana still lacks integrated aluminium production because several attempts since 1969 to form a consortium of U.S.A. and Japanese companies to exploit bauxite at Kibi have failed (Ian Hamilton, op. cit., p. 600). In 1980, a correspondent of the West Africa Magazine indicated that the situation had not changed, regarding the future of Ghana's aluminium industry (see West Africa, 1980, March 24, pp. 518-523; March 31, pp. 571-573; and April 11, pp. 655-660, a series of articles entitled, "Imperialism and the Volta Dam").

On the other hand, since 1973 the government of Ghana has been trying to secure the assistance of some other countries, including the Soviet Union and Hungary, in order to initiate an integrated project that will utilize the Nyanahin bauxite deposits (Cameron Duodu, "Volta Dam Presages Era of Co-operation," Financial Times, Wednesday, January 10, 1973). In 1976, Marshall also noted that Mitsubishi and Nipon were involved in a feasi-

It must be stressed that the government of Ghana is unable by itself to undertake the development of Ghana's bauxite mines because of the great capital cost involved, in addition to the difficulty of obtaining sufficient personnel with adequate knowledge and experience in aluminium production, which is a highly specialized field.
APPENDIX II

SOCIAL AND ECONOMIC BACKGROUND OF GHANA
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Ghana, under the National Liberation Council (NLC), experienced drastic changes in her economic policy. NLC's policy was based on principles of consolidation and liberalization which was diametrically opposed to the economic policy of the ousted Convention People's Party (CPP) government under Nkrumah. The policy of consolidation implied "economic stock-taking" (National Liberation Council (Ghana) 1966: A text of broadcast to the nation by Lt. Gen. J.A. Ankrah, Chairman of the National Liberation (NLC): New Economic Policy for Ghana, Ghana Today, March 23, 1966, Vol. 10:2, p.1) and the objective was "the restoration of a healthy (Ghanaian) economy" (Ibid., p. 1), while economic liberalization implied less state participation in the national economy. In pursuit of this policy of consolidation, the NLC abandoned Nkrumah's Seven Year Development Plan, which had existed for only two years and which had a programme for the implementation of some of the potential benefits of the VRP, for example, inland water transportation and irrigation farming. Half-completed industrial projects of the Nkrumah regime were halted; state enterprises considered uneconomic or contrary to the government's declared economic policy, were sold off to Ghanaian and foreign interests (Judith
In addition, Ghana's currency, the cedi, was devalued in 1967. An attempt was made to improve Ghana's food production. As first step towards this goal, Ghana's co-operative movement, which had become a political wing of the CPP, was re-instituted as a purely economic organization. It functioned as a marketing and producing co-operative.

Similarly, in accordance with its policy of economic liberalization, the NLC aligned Ghana's economy with the transnational companies, instituted liberalized import policies, and relaxed foreign exchange controls. Thus, they removed the rigid control of import and, in addition, used supplier credits as a form of external borrowing, which had been a characteristic of the Nkrumah regime since 1962. Finally, active state participation in the Ghanaian economy was limited to the production of industrial raw material, like rubber, oil palm, sugar cane, cotton, livestock, and so on, where the government thought large-scale organization had a decided advantage in production, in the introduction of new crops and proven techniques, and in the opening up of uncultivated areas. On top of this, a decree promulgated in 1968 made it possible for local and foreign business interests to expand without undue restrictions. All these measures were taken in order to deal with Ghana's huge external debt of some $400 million (1,000 million cedis), a legacy of Nkrumah's regime.
The NLC liberal policies were made possible by the dramatic increase in cocoa prices during the spring of 1966, which brought about a viable Ghanaian economy for a brief period of time. It alleviated temporarily the balance of payments crisis and made possible the importation of commodities and the relatively active functioning of trade and commerce (Judith Marshall, op. cit., p. 55). This did not, however, bring about any dramatic expansion of industries. But the policies of the NLC had their side-effect as well. Massive retrenchment from the state projects in industry, construction, infrastructure and farming drastically reduced employment opportunities in the urbanized southern Ghana. It is estimated that some 63,000 workers were laid off over a two-year period, and while strikes were officially illegal, there were some 200 strikes and lockouts during the 3½ years of the NLC's rule (Ibid., p. 56).

The economy of Ghana did not fare any better when from October 1969 to January 1972 Busia's Progress Party government ruled Ghana. By 1971, cocoa prices were again falling and debt repayment and foreign exchange crises had become virtually a permanent feature of the economy. The falling sales of Ghana's cocoa abroad (£194 per ton in December, 1971, the lowest since 1965) gave rise to hard currency shortages (Judith Marshall, ibid., p. 56). Private savings, which had been another source of investible funds, dwindled. And as a result of a general stagnation in agriculture, there was an accelerated exodus of Ghanaians from rural to urban areas.
In addition, Busia's austerity budget of August, 1971 brought import surcharges, restrictions on luxury goods, and a development levy on salaries and wages which prompted strike threats, particularly against the levy and demand for a raise in minimum wages from 65 to 75 pesewas (roughly 75 cents) per day. The state had to rush through, under a certificate of emergency, a new Industrial Relations Act in September, 1971 in order to forestall possible strikes. Moreover, a massive 44 per cent devaluation of Ghana's currency was instituted. The devaluation of the cedi led to a virtual collapse of Ghana's economy, and resulted in a drop in real wages. The cost of living in April, 1971 was up 100 per cent from March, 1970, with a 4.7 per cent increase from March to April (Judith Marshall, op. cit., pp. 56-57). The Volta Dam Industrial Area, which had in 1969 experienced a slump due to the NLC's economic rationalization, sank lower, while serious work stoppages, which had increased by 25 per cent in 1968 due to industrial strikes, continued (Thomas Howell et al, op. cit., p. 187). From January, 1970 to June, 1971 alone there were strike actions with 172,997 mandays lost (Judith Marshall, op. cit., p. 57). In addition, more than a quarter of the registered labour force, some 600,000, were unemployed in 1970 (Ibid., p. 56). Finally, despite modest western economic aid to the Progress Party government, economic progress was hard to come by. 'In an attempt to fulfill its national commitment to Ghanaians, however, the Busia government sought, but with
little success, a ten-year moratorium for repayment of Ghana's British debts. So, socio-economically, all was not well for Ghana when the January, 1972 military coup swept away Busia's government. Nonetheless, during the next seven years of NRC government, Ghana experienced its worst socio-economic stagnation since independence.

During the rule of the National Redemption Council (NRC), an attempt was made by the government to 'resurrect' some of the policies of Nkrumah. A vigorous curtailment of imports and campaigns to popularize locally produced goods, a revaluation of the cedi, and repudiation of some national debts, along with rescheduling of others, were some of the measures taken to stabilize the economy. Increase in cocoa price and higher prices on the world market for gold and timber after 1971 gave Ghana some relief (Judith Marshall, op. cit., pp. 58-59). Being aware of the existing problems in the industrial sector, such as under-utilization of industrial productive capacity, high dependence on imported raw materials, low-grade management capacity and poor financial support in the state-owned industries, the government launched "Operation Feed Your Industries Programme" (Quarterly Economic Review (Ghana Commercial Bank publication), April–June, 1978, Vol. 1:2, p. 5), designed to produce sufficient raw materials locally for industry so as to gradually remove the high dependence of the country's industries on imported raw materials and increase the existing industrial capacity which was largely underutilized. And the policy of increasing Ghanaian participation
in the country's industrial development was given a further boost with the promulgation of the Investment Policy Decree in 1975 (NRCD 329). Under this decree, a complete foreign ownership of business in Ghana was no longer permitted. Foreigners who wanted to do business in that country should henceforth team up with either the government or Ghanaians (Ibid., p. 5).

And in the agriculture field, the NRC's policy of Operation Feed Yourself (OFY), in which, as Marshall has observed, "an array of material and moral incentives were offered, ranging from guaranteed minimum prices to a food production corporation, state farms and technical inputs such as seeds, fertilizers, tractors and combined harvesters," (Ibid., p. 59) made rice production increase from 11,000 in 1971 to 61,000 tons in 1973; maize production jumped phenomenally from 53,000 tons in 1971 to 430,000 tons. But Marshall has argued that the guaranteed prices and government-subsidized inputs benefited rich farmers, civil servants, business and military officers (mostly absentee farmers, who responded with great eagerness to the new opportunities) more than Ghanaian peasant farmers, who were primarily involved in active farming. As a policy to ease foreign exchange pressures, OFY had some success, but the dramatic leaps in oil prices, in the view of Marshall, more than matched the savings from decreased food imports. In 1972, oil imports amounted to 25 million cedis. By 1974, they were estimated at 130 million cedis (Ibid., p. 58).
So, the NRC's attempt to tackle Ghana's foreign exchange problem through self-sufficiency in food production did not achieve its intended results, partly because increased demand for oil and spare parts for the transport sector exacerbated foreign exchange problems. But Marshall has noted that little attention was given to replacing motor transport with water and bicycle transport. In her view, a more fundamental strategy of transformation based on self-reliance and local initiative and innovation would have been a better approach (Ibid., p. 59).

Finally, according to the Ghana Commercial Bank Quarterly Economic Review's report (on "The Manufacturing Industry in Ghana," April-June, 1978, Vol. 1:2:5), the most single discouraging aspect of Ghanaian industrialization is that it has not succeeded in diversifying the economy. The country is as dependent on cocoa in 1978 as it was at the turn of the century. It also contends that while fluctuations in the world price of cocoa do exert a significant influence on the course of the country's industrialization, the structure of the industry itself makes it difficult to make significant reductions in foreign exchange allocation to the industrial sector even in balance of payments crisis without impairing its efficiency or contribution (Ibid., p. 5).
APPENDIX III

GHANA'S POWER CRISIS
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According to Dadinkai, Ghana appears presently to be in an energy crisis for two reasons (Yakubu Dadinkai, "Akosombo Power Gets Exhausted," Weekly Spectator, Saturday, June 16, 1979, p.1). To enable it to proceed with its expansion programme, VALCO has not only applied for 55 MW to which, by a 1962 agreement between VALCO and the government of Ghana, it is entitled, but has requested an additional 30 MW, making a total of 85 MW. This obligation cannot be met by the government because the power supply from Akosombo has been completely exhausted. This has made the building of a second dam at Kpong on the Lower Volta necessary. But even the additional 147 MW of power which the Kpong dam is to yield will not meet the country's future electricity needs. Ghana will have to develop an additional source of power, estimated at 1,400 MW, to develop Ghana's bauxite deposits and to service its aluminium smelters, iron and steel industries, and so on. But even if all the viable hydroelectrical potential was exploited as planned from small dams on the other rivers such as the Pra, Tano and Bui, they would produce only 610 MW, which is less than the estimated 1,400 MW needed by the country. Thus, as the then Commissioner for Fuel and Power, Lt.-Col. Abudulai Ibrahim observed in April 30, 1979, "...when the Akosombo dam was commissioned in 1965, it was expected that this single major source
of power would be capable of meeting our energy needs up to 1980" (Lt.-Col. Abudulai Ibrahim. A speech at the opening ceremony of the Interdisciplinary and Intercultural Seminar at Kwabenya, Ghana, cited Yakubu Dadinkai, ibid., p. 1) but, as he further remarked, "within a period slightly more than a decade ... the 599 MW of power generated from the Akosombo Dam have proved to be inadequate" (Ibid., p. 1). This had necessitated the building of a second dam at Kpong on the Lower Volta.

The Kpong hydroelectric project, which was started in November, 1977 and which is "about 38 per cent complete," (Ghana News (Ottawa, Canada: Office of the High Commissioner for Ghana, August, 1979), p. 4) is expected to be completed by the end of 1981 at an estimated cost of 600 million cedis, including 140 million cedis in local currency (Ibid., p. 4). But in light of the above facts, the seriousness of Ghana's energy crisis cannot be denied.

We might note that the Ghanaian experience is not unique. On May 4, 1974, Henry Tanner (of the New York Times) wrote about the Aswan High Dam, which had for many years been regarded by Egyptians "as a man-made miracle that was going to solve all their formidable problems by providing water to make the desert bloom power to get hundreds of new factories started and electricity to light the peasant villages" for the Egyptians (Henry Tanner, "Debate Flares in Egypt Over Aswan Dam," New York Times, May 4, 1975, p. 1). He said:
That is no longer the view. It is now recognized that if President Anwar el-Sadat's drive for foreign investments succeeds, the country will soon need far more power for industry than they can provide. In a few years Egypt will be short of power. This is why the government is interested in American and European nuclear reactors and other major power projects. (Ibid., p. 1)

Ghana and Egypt are now faced with an energy crisis and are seriously concerned about how to deal with the problem. The capital investment needed for energy development in Ghana and Egypt will be considerable.
Books


Articles


F.A.O. (Food and Agriculture Organization). Commodity Reviews and Outlook. 1967/77, p. 84.


Nature, "Dam; After the Dam the Depression?" June 19, 1975, 255, p. 570.


Nkrumah, Kwame. Press Conference in Ottawa, Canada. African Digest, August 20, 1958, p. 73.


Turner, Darrell J. "Dams and Ecology: Can They be Made Compatible?" Civil Engineering, September, 1971, pp. 76-80.


Reports


Government Documents or Publications


