

Case Study Report on Capacity Development

A Study of the Effectiveness and Problems of JICA's Technical Cooperation from a Capacity Development Perspective

Case Study of Support
for the Advancement of
Ghana's Irrigated Agriculture

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Ghana's Irrigated Agriculture

Takahiro MIYOSHI
Representative Director, M M Service Inc.

Narihide NAGAYO
Senior Advisor, JICA

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Fax: (81)-3-3269-2185
E-mail: iictas@jica.go.jp

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Introduction

This study examines the effectiveness and problems of technical cooperation provided by the Japan International Cooperation Agency (JICA) from a Capacity Development (CD) perspective through a case study to Ghana for the advancement of their irrigated agriculture. Since its establishment, under the slogan of “human development and nation building” JICA has promoted assistance to developing countries using technical cooperation focused on the three main areas of dispatching experts, supplying equipments and materials, and conducting training in Japan. However, now there is a push to reexamine the impact of this approach, and how it should be. Currently, major donors from various countries are shifting from technical cooperation to the provision of general budget support to the national treasuries of developing countries, or the provision of budget support such as common basket funds. Some are even of the opinion that Japan’s technology-focused support is already “outdated.” Furthermore, as is symbolized by the recommendation issued by the United Nations Development Programme (UNDP) for Capacity Development, there are assertions that the individual-based cooperation promoted by Japan has not gone as far as producing solutions for the organizational and societal levels, and a transformation is needed in the paradigm of technical cooperation. JICA’s technical cooperation, which has focused on the development of human resources, has been regarded as a given, but now there is mounting pressure to reexamine its effectiveness. In recent years, JICA has been conducting a range of studies in response to these environmental changes, and this study will help to indicate what approach JICA should take for technical cooperation in the future.

JICA’s efforts for the advancement of Ghana’s irrigated agriculture have been taken up as a case study in this report. For more than 16 years since 1988, JICA has provided assistance to Ghana’s irrigated agriculture through the Ghana Irrigation Development Authority (GIDA). In 1988, an individual expert was dispatched to GIDA, and he established the “Irrigation Development Center” (IDC). Following this, research and training on irrigated agriculture was carried out mostly at the IDC. From 1997, this was further expanded to include technical cooperation projects, and cooperation took on the form of a project covering 2 model districts. Then, after follow-up cooperation of 2 years, this endeavor developed into cooperation for the creation of a nationwide system for the management of irrigation facilities, and this style of cooperation is still continuing to be provided.

The purpose of this study is to provide suggestions for future developments by chronologically reviewing the long process of cooperation, carefully examining and analyzing the wide-ranging views and opinions of the various persons involved, drawing out the characteristics of JICA’s technical cooperation, and then systematically sorting out their effectiveness and problems. Due to the timeframe and other factors, this study will be limited to the case example of JICA’s technical cooperation in Ghana’s irrigated agriculture. So, readers should note that the conclusions arrived at in

this report may not necessarily be able to be generalized as characteristics for all of JICA's technical cooperation.

This paper is comprised of 4 chapters. In Chapter 1, as an overview, we summarize the current state and problems of irrigated agriculture in Ghana, and track the flow of JICA's efforts to resolve them. In Chapter 2, we divide JICA's cooperation of the 16 years into 4 phases, and reveal respective characteristics so as to analyze their effectiveness and problems. In Chapter 3, we analyze the results of field studies in Ghana. Finally, in Chapter 4, from the flow of the previous chapter, we organize and analyze the effectiveness and problems of JICA's technical cooperation from a Capacity Development perspective. In addition, we also raise proposals on methods for overcoming the problems while making full use of the advantages of Japan's style of cooperation.

Supplementary Theory: Capacity Development (CD)

Capacity Development (CD) is the viewpoint from which the arguments contained in this study are based. Before commencing the main discussion, we will summarize the concept of CD and its trend in JICA.

Arguments regarding the impact of aid have mounted since the 1990s, and articles and statements which are skeptical about the impact of particularly technical cooperation have become conspicuous. For example, the 1991 *Human Development Report* had already raised the suggestion that “technical cooperation is the area of development assistance that is most in need of review,” and there was a spate of skeptical criticism against technical cooperation, including the acrimonious criticism by the DAC Chairman at the Maastricht International Conference in 1990: “That technical cooperation is depriving jobs from competent persons in developing countries is a waste of resources and is difficult to accept.”

JICA summarized the various criticisms of technical cooperation in its research report, “The Effectiveness and Problems with the Japanese-style of International Cooperation,” as follows:

(1) Problems on the part of donors

Ownership diminishes due to cooperation being donor-driven (or priority being given to the needs of the donor).

Because too much emphasis is being placed on short-term goals, cooperation ends up being centered around the activity of the expert, and capacity and institutional development are neglected.

The expert-counterpart method is ineffective. (In addition to above, the enthusiasm of the counterparts is an issue.) It is inefficient. (There is a great expense incurred in recruiting and dispatching experts.) There are also negative impacts. (Employment opportunities are being taken away.)

Donor management issues. (Individual projects are implemented disjointedly. They are not consistent with the national plan of the partner country. Aid is not being coordinated.)

(2) Problems on the part of aid-recipient countries

Management issues of developing countries (Developing countries do not have enough capacity or systems to adjust, absorb and internalize technical cooperation into the country’s own national system.)

Policy environment problems in developing countries (There are a number of instances where policies in conflict with the project purpose are adopted.)

Institutional environment problems in developing countries (Problems include corruption and undeveloped legal systems. Systems which can effectively utilize technology have not been

developed.)

(3) Other problems

Since it is basically (grant) aid, the level of cost-consciousness from a cost-benefit perspective diminishes, and market selection is not conducted.

Various recommendations to counter these issues have been put forward, but the most important and that which has become the turning point of the paradigm shift is the *Capacity for Development: New Solutions to Old Problems*, which was released by the UNDP in 2002. The report organizes and analyzes the abovementioned issues surrounding technical cooperation, and criticizes that the “old model” of technical cooperation in question is based on the following mistaken assumptions:

- The approach ignores existing capacities in developing countries, and tries to replace them with knowledge and systems produced elsewhere. Development in this case is not transformation, but rather replacement or displacement.
- The asymmetric donor-recipient relationship. This is the belief that, while donors and aid-recipients are regarded as equal partners, the development process is (should be) controlled by the donor.

Since technical cooperation had been conducted based on these “mistaken assumptions,” the technical cooperation undermined local capacity, distorted priorities, chose only high-profile activities, and undertook technical cooperation which ignored local needs under fragmenting management by expensive methods. This was the analysis of the report.

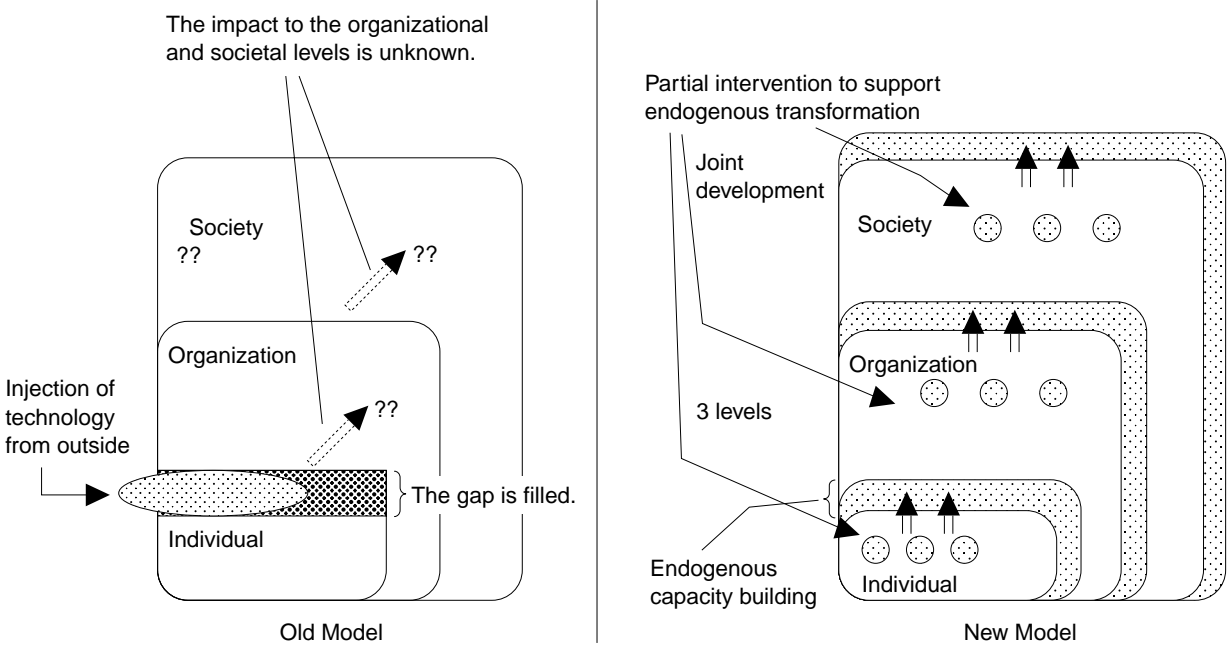
Table A-1 A Shift in the Paradigm in UNDP Reports

		Current paradigm	New paradigm
1	Nature of development	Improvements in economic and social conditions	Societal transformation, including “building of right capabilities”
2	Conditions for effective development cooperation	Good policies formulated overseas	Good policies formulated endogenously in developing countries
3	Symmetric property of donor-recipient relationship	Should be handled generally through a “spirit” of partnership and mutual respect	Should be addressed as a problem for which concrete measures should be taken
4	Capacity Development (CD)	Human resource development (also combined with institutional development)	Should be developed as three cross-linked layers of capacity: individual, organizational and societal
5	Acquisition of knowledge	Knowledge is transferable	Knowledge has to be acquired
6	Forms of most important knowledge	Development of knowledge in the North, and export of the knowledge to the South	Local knowledge combined with knowledge acquired from other countries in the South or the North

Source: Created by author from Fukuda-Parr, Sakiko et al. (2001)

In order to break free from this situation, the report questions the fundamentals of the aforementioned mistaken assumptions, and asserts that there needs to be a “shift to a new paradigm.” This assertion can be summarized as in Table A-1. In other words, according to this new paradigm, development is a transformation, not something displaced from outside, and knowledge should be acquired endogenously, but it is not something transferred from north to south. Furthermore, in order to support this, the policy environment also needs to be endogenous. CD is not simply something at the individual level, but it needs to be concurrently implemented at the organizational and societal levels as well. The relationship between the donor and the developing country is not a problem that should be settled with a generality such as the partnership spirit, but rather there needs to be a concrete awareness of the problem. Figure A-1 maps out this kind of thinking.

Figure A-1 The “Old Model” and the “New Model” of Technical Cooperation



Source: Created by author

In the old model, despite that the capacity needed by developing countries requires improvements for organizations and social systems to which those individuals belong, what is actually being carried out is external experts “injecting” foreign technology to individuals only. Injection is the notion, for example, where the technology of a so-called developed country is introduced without adjustment, and the technological gap for individuals in the partner country is filled. With technical cooperation in the old model, the cooperation does not go beyond introducing technology from outside to the individual level, and it is unclear how this will impact on the organization and society. Furthermore, in worse cases, there may be instances where experts do nothing more than substitute for the work of the counterparts in the developing countries. On the contrary, in the new model, efforts are undertaken to build capacity, not just for individuals, but also for organizations and society as well. This is not a gap-

fill injection of technology from outside, but it is partial intervention for the counterparts to build their endogenous capacity, and acquire problem-solving abilities for themselves. Against these two models, JICA's support very much aims for person-to-person technology transfer at the individual level, and the relationship is donor-driven, so JICA's approach may be criticized as fitting the old model.

In response to this kind of criticism, JICA issued a report called, "The Effectiveness and Problems with the Japanese-style of International Cooperation," where it conducted analysis based on several examples of JICA's best practices. With cases of JICA's projects referred to, the report asserts that these criticisms against the old model do not fit JICA's projects. Table A-2 sets forth the reasons.

Naturally, these counterarguments to the criticisms are the views of the author of this report and are not JICA's official views. Furthermore, although these counterarguments are based on 31 examples of JICA technological projects, these are "best practices," as the report also admits, and further research will be necessary in order to conclude that these best practices are typical of JICA's technical

Table A-2 Criticisms towards Technical Cooperation, and the Responses in JICA's Report

Criticisms towards Technical Cooperation	Responses in the JICA Report
Centered around the conduct of practical business. Only filled the gap.	JICA's technical cooperation has emphasized "technical cooperation for human resources development" based on Japan's technological knowledge and experience. It does not fill gaps, but rather supports human resources development in the partner country.
Only substituted for the work of counterparts, and deprived them of employment opportunities.	In addition to the response similar to the above, the report said that the criticism would apply to experts employed on consultant contracts, and that in JICA's case, its experts are mostly recruited from government offices and related organizations for a limited period of time, so the criticism would not apply in most instances.
The relationship between donors and developing countries is not equal, and asymmetrical. The needs of the partner country are ignored, and there is no ownership.	From its own previous experience as an aid-recipient country, Japan has a basic attitude of emphasizing ownership by the developing countries and supporting self-help efforts. In addition, Japan respects the national plans of the partner countries, jointly formulates proposals based on the principle of "requests-basis," and promotes cost-sharing. Furthermore, Japan has never set conditionalities.
Preoccupied with transfer of foreign knowledge and systems.	As part of its process for modernization, Japan has experience in making improvements on the knowledge and systems of developed countries before adopting them, rather than just a mere transplant. Stemming from this kind of experience, JICA's approach is to place importance on identifying the needs of the partner country, internalizing the knowledge, and utilizing local knowledge.
The means for acquiring knowledge is inadequate; not the knowledge transfer.	The method of technology transfer in JICA's technical cooperation is not just training and other types of formal education, but it embraces OJT and group learning through projects, and has already started implementing the UNDP recommendations.
Efforts are needed at the three levels of individual, organization and society.	JICA's technical cooperation places importance on the development of institutional capacity and on the direct capacity development of counterparts, and it has not expressly conducted efforts for the societal level. However, its support for organizations that perform a social function can be regarded as having favorable impacts on sectors and society.

Source: Created by author

cooperation. At present, the Research Group at JICA's Institute for International Cooperation is taking the lead to conduct various lines of research on CD.

At the same time, it could probably be said that these criticisms for technical cooperation and the counterarguments in JICA's report reveal the particularity of how far JICA's technical cooperation is removed from the technical cooperation of donors at large. Surely the technical cooperation developed by JICA for many years with an emphasis on "human resources development" cannot actually be grouped together with the type of technical cooperation that "deprives jobs from persons in developing countries," as criticized scathingly by the aforementioned DAC chairman. Technical cooperation is defined as "cooperation or support through technology," but it is easily conceivable that there will be considerable variances according to a type of aid philosophy, its purpose, and a type of approach for implementation. To start with, there is a chance that using the term "technical cooperation" to bundle together these different forms of aid, and then arguing the rights and wrongs, will lead to needless misunderstanding. What is important here is not to investigate the general effectiveness of assistance that is implemented under the name of technical cooperation, but it is important to clarify what kind of technical cooperation is effective. In this study, we will focus on this issue and proceed with an investigation based on hard facts so as to lead to more practical recommendations.

Chapter 1

Historical Changes in Technical Cooperation Provided to Ghana's Irrigated Agriculture Sector

Aim of this chapter: As one of the settings for JICA's technical cooperation, which is the subject of this study, this chapter summarizes the history and the issues of Ghana's irrigated agriculture sector, and outlines the flow of technical cooperation undertaken by JICA.

1-1 Overview of Ghana's Irrigated Agriculture

1-1-1 General Overview

Agriculture is a key industry with a central socioeconomic position in Ghana. According to statistics from the year 2000, Ghana's agricultural sector accounts for about 65 % of the work force, about 40 % of the gross domestic product, and about 40 % of foreign currencies acquired through exports. Although this demonstrates that the agricultural sector is the key industry of Ghana, the structure of the industry is vulnerable because the industry relies on rain-fed agriculture during a roughly 6-month rainy season when almost all of its production is conducted. There is also a high risk of droughts and other types of unseasonable weather. Under these conditions, irrigation development has been implemented as a national policy for food security and the development of rural areas, by means of agricultural production that is conducted throughout the year.

The history of irrigation development in Ghana is quite short. For roughly 40 years since its inception in the 1960s, approximately 19,000 hectares (ha) of land has been developed. Of the land, approximately 9,000 ha have been developed by the Government of Ghana, with the remainder of the land having been developed by the private sector. At present, there are 22 public irrigation districts in the whole country. Most of the development of these public irrigation districts has been conducted with financial and technological support through bilateral cooperation with foreign countries including China, the former Soviet Union, Taiwan, Japan and Republic of Korea, or from international organizations, including the UN Food and Agriculture Organization (FAO) and the World Bank. The reasons for the support are: Ghana lacked the financial capacity to bear the costs of irrigation development (current development costs are between approximately US\$ 4,000 and US\$ 10,000 per ha); and Ghana lacked accumulated technology and systems necessary for irrigation development.

After World War II, irrigated land areas increased rapidly in the world. In particular, the increase of irrigated land was phenomenal after 1960. In 1961, the area of irrigated land measured 139 million ha, and by 1996, this increased to 263 million ha. Of this, irrigated land in developing countries accounted for approximately 70 %. It is estimated that the area of irrigated land on the African

continent is approximately 12.4 million ha, or 7.5 % of arable land.¹ However, the rate of increase peaked in the mid-1970s with an annual rate of 2.3 %, and since then it has slowed. A number of reasons can be cited for this deceleration, including a rise in construction costs, a decline in market prices for crops, an increasing recognition of environmental and social costs, and a slump in the performance of irrigation. The rise in construction costs was, in part, brought about by the decline in land suitable for development. Under these circumstances, the World Bank and other organizations have been curtailing their investment in agriculture since 1980, especially in irrigated agriculture. This has been one of the direct causes for the declining rate of increase in irrigated land areas in developing countries.²

Irrigation development in Ghana has also followed the global movements, with a peak in 1970. However the scale of overall development has remained incredibly low. Irrigated land, measuring approximately 19,000 ha, represents a mere 1 % of approximately 1.9 million ha of land suitable for development, and only approximately 0.36 % of approximately 5.3 million ha of agricultural land.

1-1-2 Implementing Agency of Irrigated Agriculture (Outline of GIDA)

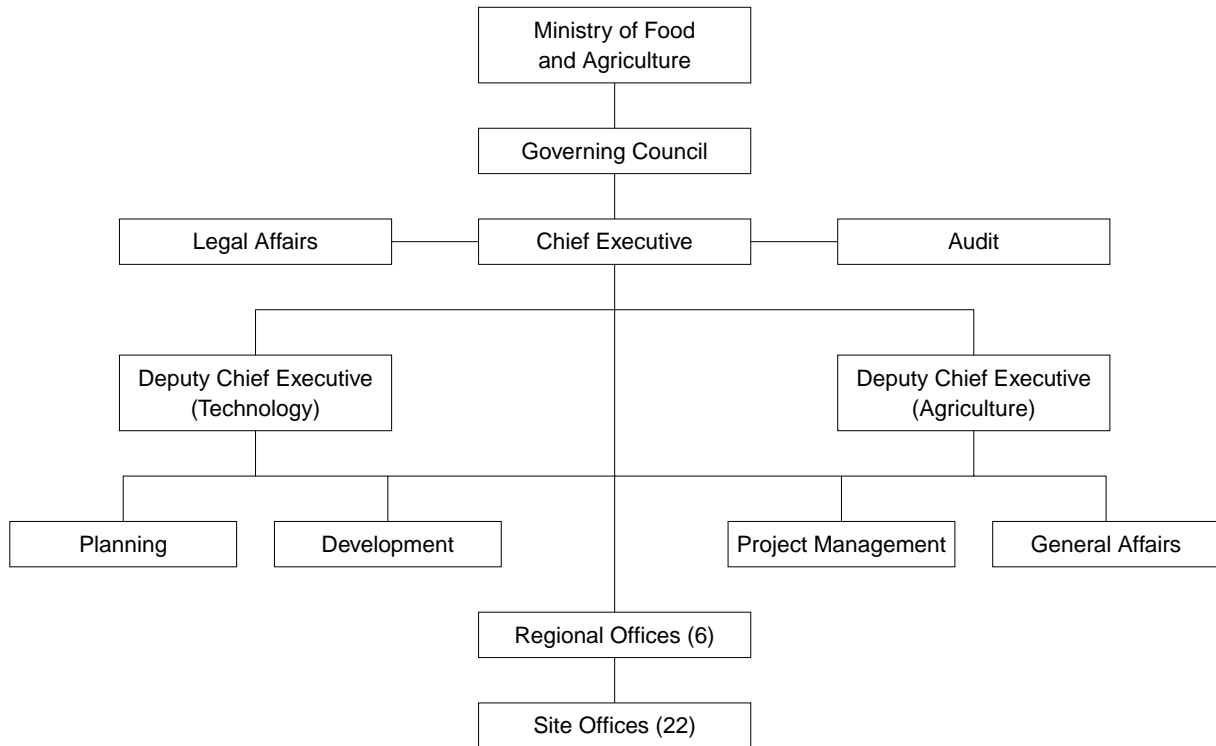
JICA's technical cooperation for irrigated agriculture in Ghana, which commenced in 1988, has been implemented with the Ghana Irrigation Development Authority (GIDA) as JICA's counterpart organization. GIDA is a government organization that comes under the jurisdiction of the Ministry of Food and Agriculture, and the only public organization linked to irrigated agriculture. GIDA's forerunner was the Land Improvement and Preservation Unit, which was established in the early 1950s within the Department of Agriculture for the purpose of soil conservation in the northern part of Ghana. This was promoted to the Irrigation Development Department within the Ministry of Agriculture in 1965, and then established as GIDA by government decree in 1977. GIDA is in charge of surveying candidate sites for irrigation development across Ghana, designing and constructing facilities, managing and maintaining irrigation-project districts under further development, and disseminating farming technology among farmers. GIDA has actually developed 22 irrigation-project districts of varying sizes in a total developed area of 8,800 ha across the country.

Figure 1-1 describes the organizational structure of GIDA. Under the Chief Executive sits, 2 Deputy Chief Executives (technology and agriculture) who oversee their respective fields. GIDA's head office is comprised of 4 departments: Planning, Development, Project Management, and General Affairs. Throughout Ghana, there are 6 Regional Offices and 22 Site Offices. In the Site Offices, there are project managers and agricultural extension officers, and they are in charge of managing the irrigation districts and providing technical guidance to farmers.

¹ Tsutsui (2000), FAO (1996).

² Oga (1998).

Figure 1-1 GIDA Organizational Chart



Source: Created by author

Since its establishment, GIDA has been developing and managing the public irrigation districts with a tremendous amount of government subsidies, and the staff assigned. However, as part of its policy for structural adjustments, the number of personnel at GIDA was reduced. The roughly 1,500 personnel of the 1980s were cut sharply to 739 in 1993, 441 in 1994, and 377 in 1995; now in 2004, there are no more than 304 personnel. This number is made up of 121 head office personnel (including Irrigation Development Center (IDC) staff), 73 personnel at the Regional Offices, and 110 personnel at the Site Offices. GIDA's budgets have also been continually cut since the structural adjustments. Its financial conditions, as presented in Table 1-1, portray an especially harsh picture, with personnel expenses accounting for 82 % of the total expenditure. The aggregate of administrative expenses and

Table 1-1 Breakdown of GIDA Expenditure in 2003

Account	Expenditure (US\$)	
	Government of Ghana	Aid agencies
Personnel expenses	548,183 (82 %)	
Administrative expenses	78,045 (12 %)	
Service expenses (project expenses)	43,974 (6 %)	
Investment (facilities construction)		2,699,093
Total	670,202 (100 %)	

Source: Created by author

project expenses is no more than about US\$ 120,000, so it is extremely difficult to manage the public irrigation districts appropriately.

1-1-3 Outline of Public Irrigation Districts

Table 1-2 outlines the public irrigation districts managed by GIDA. These public irrigation districts are scattered around Ghana, and they cover a total of approximately 8,800 ha. The number of farming families that benefit from the districts amount to approximately 11,000, and the average cultivated area per household is approximately 0.8 ha. In other words, Ghana's irrigated agriculture is comprised of small-scale farmers. It is for this reason that JICA's project-type technical cooperation offered from August 1997 to July 2004 was titled "The Small-scale Irrigated Agriculture Promotion Project". The 22 public irrigation districts are classified into 13 small-scale irrigation districts (about 60 % of all the districts) of 100 ha or less, 5 medium-scale irrigation districts of between 100 and 500 ha, and 4 large-scale irrigation districts of 500 ha or greater. By type of irrigation, there are 8 districts irrigated by pump, 5 districts irrigated both by pump and gravity, and 9 districts irrigated by gravity. Ghana has a large number of irrigation districts that use pumps, which are costly to operate and maintain facilities. The reason for this is that much of Ghana is topographically flat, and hence there is little land suitable for gravity-type irrigation development.

Ghana's irrigated agriculture aims to produce rice and vegetables. With recent urbanization and the growth of the middle class, the amount of rice consumed is steadily increasing. Along with these structural changes of Ghana's society, the consumption of rice is growing in comparison with its staple food of yams and other tubers because rice has the advantages of being easy to cook, and easy to store. In the year 2000, the consumption of rice per capita was 20 kg, and the total national consumption of rice was approximately 400,000 tons per year. However, rice production has not been able to keep up with the increasing consumption, so Ghana is reliant on imported rice for about 50 % of its domestic consumption, or 200,000 tons, and consequently expends approximately US\$ 100 million each year.

Ghana's Ministry of Food and Agriculture has set one of its key policies to ameliorate this situation, in other words, to reduce the amount of imported rice by increasing its domestic rice production. Nonetheless, increased rice production based on this policy has not been made smoothly. Its problem lies in the declining profitability of rice cultivation. Incentives for farmers to cultivate rice are on the decline because of competition with imported rice (an influx of better quality and less expensive rice), and the soaring prices of imported agricultural materials and equipment which farmers rely on.

Under these circumstances, farmers' interest is being shifted to the cultivation of more profitable vegetables (including okra, fresh maize, cabbages, red peppers, tomatoes, and onions). However, there

Table 1-2 Outline of Public Irrigation Districts (as at June 30, 2003)

No.	District	Area of developed land (ha)	Area of actually irrigated land (ha)	Irrigation type	Target crop	Remarks
1	Ashaiman	155	56	Gravity-type	Rice and vegetables	
2	Dawhenya	200	150	Combination of gravity-type and pump-type	Rice	
3	Kpong	2,786	616	Gravity-type	Rice and vegetables	
4	Weija	220	0	Pump-type	Vegetables	Abandoned irrigated agriculture in 2003
5	Afife	880	880	Gravity-type	Rice	
6	Aveyime	60	0	Combination of gravity-type and pump-type	Rice	Abandoned irrigated agriculture in 1998
7	Kpando Torkor	40	6	Pump-type	Vegetables	
8	Mankessim	17	17	Pump-type	Vegetables	
9	Okyereko	81	42	Gravity-type and pump-type	Rice	
10	Subinja	60	6	Pump-type	Vegetables	
11	Tanoso	64	15	Pump-type	Vegetables	
12	Sata	34	24	Gravity-type	Vegetables	
13	Akumadan	65	0	Pump-type	Vegetables	Abandoned irrigated agriculture
14	Anum Valley	89	0	Combination of gravity-type and pump-type	Rice	Abandoned irrigated agriculture
15	Amate	101	0	Pump-type	Rice	Abandoned irrigated agriculture
16	Dedeso	20	8	Pump-type	Vegetables	
17	Kikam	27	0	Combination of gravity-type and pump-type	Rice	Abandoned irrigated agriculture
18	Bontanga	450	390	Gravity-type	Rice and vegetables	
19	Golinga	40	16	Gravity-type	Rice and vegetables	
20	Libga	16	16	Gravity-type	Rice and vegetables	
21	Tono	2,490	2,450	Gravity-type	Rice and vegetables	
22	Ve	850	500	Gravity-type	Rice and vegetables	
	Total	8,745	5,192			

Source: Created by author

are many problems of pests, and it could be argued that the cultivation of perishable vegetables still involves taking risks.

1-1-4 Transition of the Management Framework for Irrigation Districts

As previously mentioned, GIDA's personnel and budget were substantially reduced as a part of the government's structural adjustments. As a result, in early 1990, fundamental changes were also made to the management framework of the public irrigation districts. In terms of finance and personnel,

keeping the previous “government-led management” system going had become difficult, and so a “Participatory Irrigation Management” was introduced whereby beneficiary farmers and others could manage the irrigation facilities.

This transition from “government-led management” to “farmer-led management” has become a major trend in the irrigated agriculture sectors of developing countries. In many developing countries, government financial and human resources were used for almost everything from the construction to the maintenance of the majority of irrigation facilities developed under state projects after World War II. Therefore a situation has been brought about where farmers who are the beneficiaries of the facilities have a poor awareness of the responsibility toward the management of the facilities, and making disbursements for maintenance costs has become difficult because of financial constraints. As a result, many of the irrigation districts are now confronted with the problems of inappropriate water and facility management. Against this kind of backdrop, there are an increasing number of developing countries that started to adopt the system of “Participatory Irrigation Management,” which is designed to cut government expenditure and to improve water management.

In Ghana, since the introduction of the system of “Participatory Irrigation Management” in early 1990, the operation and maintenance of irrigation facilities in the public irrigation districts has been mostly conducted with funds sourced from irrigation service charges collected from the beneficiary farmers. Irrigation service charges are determined with consideration given to the irrigated land area of each farmer, the irrigation type of the district in question (by pump, and/or gravity), and the standard of the facilities. Therefore irrigation service charges per unit area (ha per season) differ by several ten to several hundred US dollars.

1-1-5 Transition of Policies for Irrigated Agriculture, and Japan’s Technical Cooperation

Irrigated farmland accounts for no more than 17 % of the world’s farmland, but supports approximately 40 % of the world’s food production. In this sense, irrigated agriculture performs a large role in food security and its productivity is quite high in comparison with rain-fed agriculture. For this reason, as mentioned previously, despite development costs being high, developing countries have promoted irrigation development in order to increase food production in response to population growth. With this ongoing trend, Ghana has been promoting irrigation development policy since the 1960s, and the country conducted new development-oriented projects until the 1980s.

It is not until the mid-1980s that the focus finally turned to the “effective utilization of existing irrigation districts”. What triggered this was the World Bank’s review on Ghana’s irrigated agriculture issued in 1986. In the review, the World Bank assessed Ghana’s irrigated agriculture as having “not showing achievements which adequately reflect the investment.” Based on this achievement, the World Bank then issued recommendations to the Government of Ghana with regard to the “functional

recovery of existing irrigation districts” and “promotion of the operation and maintenance of facilities by farmers themselves.” Behind the recommendation for the “extended participation of farmers” was the “curtailment of the government’s role” driven by its structural adjustments.

Subsequent to receiving these recommendations from the World Bank, in February 1990, Ghana formulated the Medium Term Agricultural Development Plan (MTADP), which indicates the direction of “a policy of focusing on the functional recovery of existing irrigation facilities and on improvements to their productivity by repairing and improving them, and of promoting the operation and maintenance of irrigation facilities by promoting small-scale irrigated agriculture with the participation of farmers” rather than a policy of promoting new irrigation development projects.

At that time, the following problems were pointed out at the sites of the irrigation districts: unskilled water management and farming techniques; the decline of facility functions due to a lack of thorough maintenance; and the decline of agricultural productivity. Against this background, Japan’s series of technical cooperation got underway with the dispatch of an individual expert in 1988. What the Government of Ghana sought in Japan’s technical cooperation was the functional recovery of existing irrigation districts, the promotion of the operation and maintenance of facilities by farmers themselves, the establishment of a sustainable farming system for small-scale farmers, and the enhancement of GIDA’s technical support framework for farmers.

1-1-6 Issues of Ghana’s Irrigated Agriculture

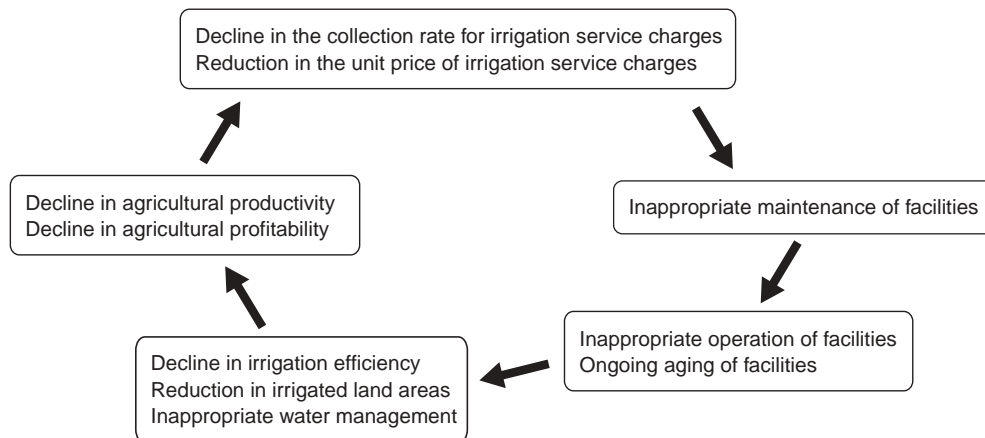
In this section, we will highlight the conditions under which Japan’s technical cooperation was provided, by describing in detail the specific issues related to Ghana’s irrigated agriculture.

(1) The issue of sustainability (a decrease in actual irrigation land areas), and the negative cycle

As mentioned previously, the total developed land area in the public irrigation districts is approximately 8,800 ha, but actual irrigation land areas have been decreasing year after year. As of 2003, they decreased to approximately 5,200 ha. In this way, Ghana’s irrigated agriculture has a serious problem in terms of its sustainability. The decrease of actual irrigated land areas is being caused by such problems as a decline in the capacity to convey and distribute water due to aging facilities, the abandonment of irrigated agriculture due to the complete collapse of facilities (pumps, etc.), and the suspension of irrigated agriculture (due to inability to bear the costs of operating pump stations).

It can be argued that these problems have become chronic owing to the emergence and acceleration of a “negative cycle,” as shown in Figure 1-2. The inappropriate maintenance of facilities causes such problems as the inappropriate operation of facilities, and the facilitation of their aging. Eventually these problems, in turn, trigger a decline in agricultural profitability, and further accelerate the problem of the inappropriate maintenance of facilities partly due to a decline in the collection rate

Figure 1-2 Negative Cycle in Ghana's Irrigated Agriculture



Source: Created by author

for irrigation service charges. This vicious cycle is a “negative cycle.” The issues surrounding the sustainability of Ghana’s irrigated agriculture can be explained using this kind of “negative cycle.”

(2) Deficiency in irrigated farming technology and fragile farmers’ organizations

Like other developing countries, Ghana had also been implementing irrigation developments with a focus on the construction of facilities, so this caused major lags in the development and dissemination of software-related technology which was necessary for the effective utilization of existing irrigation districts. To be more precise, there was a considerable shortage of technology related to water management, the operation and maintenance of facilities, cultivation, farming, agricultural machinery, etc. The shortage of irrigated farming technology was one of the factors in triggering the “negative cycle,” and it was also partly responsible for “not showing achievements which adequately reflect the investment” as criticized by the World Bank. The “vulnerability of farmers’ organizations” was also continuously pointed out as a point of issue. Irrigated agriculture is a kind of communal farming. Since beneficiary farmers who engage in irrigated agriculture share the same water resources and facilities, they must organize themselves and jointly manage irrigation facilities in order to maintain the continuation of irrigated agriculture and to raise its efficiency. If farmers’ organizations are not active, it becomes difficult to distribute water fairly, and to appropriately operate and maintain facilities funded by irrigation service charges. In other words, enhancing the development of farmers’ organizations is fundamental to promote irrigated agriculture.

Nonetheless, as stated previously, like in other developing countries, irrigation development in Ghana had been implemented without the participation of farmers and burden charges. Therefore beneficiary farmers had a poor awareness as parties involved, and were heavily dependent on the government. This fact was a major hurdle to the development and enhancement of farmers’ organizations.

(3) Absence of a farming support system

In addition to the farming technology mentioned above, a so-called farming support system is necessary for the advancement of irrigated agriculture. The farming support system refers to a financing system for farming funds, the joint procurement of agricultural materials and equipment, the joint shipment of agricultural produce, and the group usage of agricultural machinery, etc.

We will explain by taking the example of farming funds. It would appear that, not only in Ghana, but also across developing countries in general, it is extremely difficult for farmers to get loans from banks, so they end up raising funds at high interest rates from “market mummies” (agricultural produce purchasers and distributors). As a result, farmers are placed in a situation where they are forced to sell their agricultural products to market mummies under disadvantaged terms. This cycle of financing, purchasing agricultural products, and refinancing by “market mummies” has become one of the major factors for hindering the increase of farmers’ income. Even if farming techniques are disseminated and agricultural productivity is improved, the sustained advancement of irrigated agriculture will not be achieved as long as necessary farming support systems remain unimproved. In Ghana’s irrigated agriculture, most irrigation districts totally or partially lack these farming support systems. This fact has become a major obstacle to the advancement of irrigated agriculture.

(4) Lack of systems

The lack or vulnerability of systems that are necessary to implement policies for irrigated agriculture is also one of the problems Ghana’s irrigated agriculture sector face. What is particularly notable relates to the “Participatory Irrigation Management.” As discussed earlier, in the early 1990s, Ghana introduced “Participatory Irrigation Management,” under which farmers’ organizations assume responsibility for the management of facilities. However, no systems, laws or technical support that were essential in firmly establishing this management framework and increasing its effectiveness were provided. This resulted in a situation where neither farmers nor the government took responsibility for the management of irrigation districts, and Ghana’s irrigated agriculture grew stagnant.

1-2 Overview of the Transition of JICA’s Cooperation in the Irrigated Agriculture Sector

Japan’s technical cooperation for the advancement of Ghana’s irrigated agriculture got underway with the dispatch of an individual expert (from 1988 to 1991), followed by a mini project (from 1992 to 1995), and the Small-scale Irrigated Agriculture Promotion Project (the Main Phase from 1997 to 2002, and follow-up cooperation from 2002 to 2004). In this way, 16 years have passed since the inception of Japan’s technical cooperation through JICA. In 2004, a new project started in order to create a system for the management of irrigation facilities. Table 1-3 represents these series of technical cooperation in each phase from the perspective of CD. Like this, Japan’s technical

Table 1-3 Transition of Technical Cooperation from the Perspective of Capacity Development

Cooperation Scheme	Timeframe	Targets of Capacity Development
The Age of the Individual Expert	1988 ~ 1992	Formation of a base for the development and dissemination of irrigated farming techniques through organization-building (IDC)
The Age of the Mini Project	1992 ~ 1995	Establishment of a base for the development and dissemination of irrigated farming techniques through the strengthening of the organization (IDC), and the development of human resources (counterparts)
Main Phase of the “Small-scale Irrigated Agriculture Promotion Project”	1997 ~ 2002	Formation of model irrigation districts for the advancement of irrigated agriculture through the development of human resources (counterparts, farmers from model districts), and the building of farmers’ organizations (model districts)
Follow-up cooperation for the “Small-scale Irrigated Agriculture Promotion Project”	2002 ~ 2004	Formation of a nationwide framework for the advancement of irrigated agriculture through the development of human resources (farmers from all the districts), the building of farmers’ organizations (all the districts), the formulation of technical guidelines, as well as the formulation of action plans for the amelioration of farming, and subsequent assistance in the implementation of the plans
“Project for Improving the Farmer Participatory Irrigation Management System” (New project)	2004 ~ 2006	Formation of a sustainable framework for the implementation of irrigated agriculture through assistance in institution-building (system for the management of irrigation facilities), the development of human resources (farmers from all the districts nationwide), and organization-building (all the districts)

Source: Created by author

cooperation has continued in a larger scale up until now. We would now like to turn to a description of its transition.

(1) The age of the Individual Expert (from 1988 to 1992)

As previously mentioned, as a result of the World Bank’ review on irrigated agriculture in 1986, the Government of Ghana adopted the sustainable improvement of productivity in existing irrigation districts as its key policy; and to this end, the focus was then placed upon the development and dissemination of requisite irrigated farming techniques. However, at that time, GIDA possessed neither frameworks nor human resources to carry out the development and dissemination of such irrigated farming techniques. Therefore, it could be argued that, under these circumstances, the individual expert virtually approached CD for the advancement of Ghana’s irrigated farming techniques from scratch.

The most notable achievement of this expert is the establishment of the IDC. Through the vigorous efforts of the expert, who considered the establishment of a “base for the development and dissemination of irrigated farming techniques” as a starting point for everything, it was decided to construct the IDC in the Ashaiman Irrigation District (approximately 20 km from Accra, the Ghanaian capital). The establishment of the IDC from nothing was fraught with difficulties. It took approximately 3 years to develop its framework, including securing the site, constructing the building, providing electricity, water and other infrastructure, securing personnel, and building a base for

development and dissemination projects. The framework was developed mostly by the Japanese expert, and he also served as the center's founding Director General during this period. Members of the Japan Overseas Cooperation Volunteers (JOCV) program were also dispatched (forestry, rice cultivation, and farming), and they made great contributions to the establishment of the IDC. During the period while the individual expert was in Ghana, the framework of the IDC was developed; various fields, such as rice cultivation, soil, the environment, farming and general administration, were established organizationally; and personnel training was also commenced.

At that time, GIDA's civil engineers, who took charge of the planning, design and construction of facilities, held positions of absolute authority within the authority. Meanwhile, its agronomists, who took charge of the development and dissemination of irrigated farming techniques, were considered comparatively low in position. The latter did not even have their own offices, and it appeared that they did not fit within the organization. With the establishment of the center, a base for the agronomists was provided, and the first step toward the advancement of Ghana's irrigated agriculture was taken both in name and substance. It could be argued that, from the perspective of CD, the dispatch of the individual expert made remarkable achievements in "foundation-building (organization-building)" geared toward the advancement of Ghana's irrigated agriculture.

(2) The age of the Mini Project (from 1992 to 1995)

After the individual expert left, a Mini Project focused on the IDC was implemented between 1992 and 1995. 2 experts (irrigated agriculture and water management) and 2 members of JOCV (rice cultivation and afforestation) were sent from Japan. Their activities included research on irrigated farming techniques at the IDC, technical guidance at 4 irrigation districts, and seminars on rice cultivation. From about this time, rice consumption in Ghana was on an ever-increasing upward trend, and increased rice production was one of the great hopes for irrigated agriculture. Furthermore, counterpart training was also conducted in Japan, and personnel training was provided in addition to technical guidance at the IDC. At that time, the IDC was also operated mainly by Japanese. During the initial phase of the Mini Project, the position of center director was held by an expert.

It could be argued that, from the perspective of CD, the age of the Mini Project was focused on the development of irrigated farming techniques and the establishment of a framework base for the dissemination of such developments, through the strengthening of the IDC as an organization, and personal training for counterparts.

(3) Main Phase of the "Small-scale Irrigated Agriculture Promotion Project" (5 years from 1997 to 2002)

The Main Phase of the Small-scale Irrigated Agriculture Promotion Project was launched after a blank of about 2 years following the completion of the Mini Project (1995). This new project was

operated for 5 years from August 1997 through July 2002. The overall goal of the project was for technical cooperation to “improve farming systems for each irrigated agricultural district under the jurisdiction of GIDA,” and the project purpose was for technical cooperation to “establish model farming systems in the irrigated agriculture districts under the jurisdiction of GIDA.” A model farming system was defined as “a system to attempt to establish farming systems required for the implementation of combined paddy and upland crop farming with the use of irrigation facilities; and the establishment of a farming support framework (including GIDA’s technical and systematic aspects) for individual farmers and farmers’ organizations, required for the maintenance and development of farming that is conducted under those farming systems.”

The 2 irrigation districts of Ashaiman and Okyereko were selected as model districts to pilot the establishment of the model farming systems. The 2 districts are outlined in Table 1-4. The specific activities of the Main Phase were a study of farmers’ situation and the farming systems (2 model districts), the improvement of individual technology (cultivation, water management, agricultural machinery, and farming), the demonstration of the farming systems in the 2 model districts, the improvement of farming support systems in the 2 model districts, and training for farmers, government personnel, and staff from farmers’ organizations. Because this was the Main Phase of a technical cooperation project, a significant input was provided by the Japanese side, as indicated in Table 1-5. At the same time, Ghana also allocated over 20 counterpart staff, and a portion of the project costs (fuel costs, purchase of materials and equipment, etc.)

The focus of activities in this phase was the establishment of farming systems in the 2 irrigation districts, Okyereko and Ashaiman. Consequently, about 70 or 80 % of activities went to the construction of the model districts. Other activities included a variety of cultivation experiments (rice and vegetables) and research at the IDC test fields, as well as national training (technical training for

Table 1-4 Outline of the Two Model Irrigation Districts

Ashaiman Irrigation District	Okyereko Irrigation District
<p>The Ashaiman Irrigation District is located approximately 20 km from Accra, the capital of Ghana. It is a settlement precinct on land purchased by the government, and the settlers are comprised of natives from each region. The irrigation districts with reservoirs are gravity-fed irrigated land with a developed land area of 155 ha, and an actually irrigated land area of 56 ha. The number of beneficiary farming families is 94. Originally, the irrigation district was developed for paddy rice farming, but there has recently been a shift to upland crop farming (vegetables) because of the declining profitability of paddy rice cultivation.</p>	<p>The Okyereko Irrigation District is located approximately 65 km from Accra, the Ghanaian capital. Unlike Ashaiman, this district is a tribal society which is centered around a chief. The irrigation district is also gravity-fed irrigated land with reservoirs (and a pump station for supplementary irrigation) with a developed land area of 81 ha, and an actually irrigated area of 47 ha. The number of beneficiary farming families is 131. The Okyereko Irrigation District is in a region surrounded by large rain-fed fields.</p>

Note: Grant aid provided by the Japanese government was applied to both districts, and irrigation and drainage facilities were repaired and upgraded (work completed in March 2000).

Source: Created by author

Table 1-5 Input from the Japanese Side

Item	Description
Dispatch of long-term experts	Team leader; coordinator/training; cultivation; water management; farmers' organizations and farming; and agricultural machinery
Dispatch of short-term experts	Total: 16 persons
Provision of machinery and equipment	Vehicles, and machinery and equipment for research, farming, training, administration, etc. in a total of approximately JPY 104 million
Counterpart training in Japan	Total: 17 persons
Share of local costs	Approximately JPY 91 million; Other: approximately JPY 25 million

Source: Created by author

Table 1-6 Achievements of Japan's Technical Cooperation in the Model Districts

Achievement of a high collection rate for irrigation service charges and farmer-led facility management in model irrigation districts

In Ghana, the general rule is that the operation and maintenance of irrigation facilities is done using irrigation service charges collected from beneficiary farmers. However, in general, collection rates for irrigation service charges for irrigation districts remained quite low, and this caused problems such as the improper maintenance of facilities. In the 2 model districts, Japan's technical cooperation led to the successful development and reinforcement of farmers' organizations, as well as their vigorous activities. These resulted in a notable improvement to the collection rates for irrigation service charges, and substantiated what the Government of Ghana had sought in Japan's technical cooperation, in other words, the operation and management of irrigation facilities by farmers' organizations.

Increase in rice productivity, and improved farming-related revenue

The yield of rice per unit area improved considerably in the 2 model districts thanks to Japan's technical cooperation. In Ashaiman, the yield of rice was 3.6 t/ha during the rainy season at the start of the Main Phase, and increased by close to 1 t/ha to 4.7 t/ha by the final year of technical cooperation. Meanwhile, in Okyereko, productivity similarly increased by about 0.5 t/ha. These increases in rice productivity have a direct bearing on the farming-related income of each farmer. According to the results of an impact study of the assessment survey at the end of the project, most farmers responded that their income increased. Furthermore, in both irrigation districts, more than 10 % of all the farmers achieved a yield of in excess of 6 t/ha, which is on a par with Japanese farmers. This reflects the fact that Japan's technical cooperation is leading to the steady fostering of devoted farmers who possess high levels of cultivation techniques.

Operation of the Farmers' Bank, and continuous activities of farmers' organizations

As described previously, one of the major points of issue in Ghana's irrigated agriculture is the "procurement of farming funds". In order to resolve this issue, as part of Japan's technical cooperation, the "Farmers' Bank" was established in the 2 model irrigation districts. Its role is to provide loans to farmers for farming inputs such as fertilizers and pesticides. The bank works with a revolving funds system whereby farmers who get the loan of actual things make repayments with interest (at the same rate as commercial banks, and used to offset inflation and for the running costs of the Farmers' Bank). The Farmers' Bank was established in 2001, and its board of governors which is comprised of representatives from the 2 irrigation districts takes the responsibility for its operations. Full-time employees are employed by the Farmers' Bank, and the bank is being operated smoothly.

Furthermore, based on the achievements of Japan's technical cooperation, vigorous activities essential for the advancement of irrigated agriculture are being performed by the farmers' organizations. The respective farmers' organizations in the 2 model districts set up sections (farming, the operation and maintenance of facilities, marketing, etc.) respectively, and have been developing activities. They conduct general meetings, board meetings and reelections for executive officers independently, and "autonomous activities" whereby the organizations review and resolve issues related to their irrigation district by themselves have been firmly established.

Source: Created by author

representatives from irrigation districts across the nation during the project's 4th and 5th years). As a result of the project's strategic cooperative activities, numerous achievements were accomplished in the 2 model irrigation districts, as outlined in Table 1-6. They include the enhancement of the irrigation facilities management framework, and the improvement of the collection rate for irrigation service charges through the reinforcement of farmers' organizations, the improvement of the productivity of rice (yield per unit area), the establishment of a lending system for farming investments following the establishment of the Farmers' Bank, and the improvement of farmers' earnings.

It can be argued that the very model for the "promotion of facilities that are operated and managed by farmers themselves" and the "establishment of a sustainable farming system for small-scale farmers," which the Government of Ghana originally requested the Japanese side to establish through technical cooperation was established through activities in the model districts, as stated in 1-1-5. However, it is true that, throughout the period of the project, there were differing opinions among relevant parties over the interpretation of "model farming systems" as expressed in the overall goal and the project purpose, and that they went through a difficulty that prevented the efficient implementation of technical cooperation. (Refer to Chapter 2 for details.) From the perspective of CD, it could be argued that this Main Phase of this project left its mark on human resources development directed at counterparts and farmers, and on the building of farmers' organizations in the model districts.

(4) Follow-up cooperation for the "Small-scale Irrigated Agriculture Promotion Project" (2 years from 2002 to 2004)

As discussed previously, technical cooperation during the 14 years from the dispatchment of the individual expert to the Main Phase (including the 2-year interruption partway) was devoted to the creation of foundations for the advancement of farming in existing irrigation districts. Remaining issues are compiling the achievements of a series of technical cooperation, and raising the overall level of Ghana's irrigated agriculture through the nationwide dissemination of the achievements of technical cooperation. During follow-up cooperation, there was a strong awareness for efforts dedicated toward these 2 issues from the stage of formulating cooperation plans. Consequently, technical cooperation that unfolded had a project purpose to "formulate technical guidelines and strategies for the amelioration of farming systems in the irrigation districts under the jurisdiction of GIDA," with specific activities being follow-up for the amelioration of farming systems in the 2 model irrigation districts (Ashaiman and Okyereko), the formulation of technical guidelines that will contribute to the betterment of farming, the formulation of strategic papers for the betterment of farming, and the implementation of training and workshops. Table 1-7 shows Japan's input for the implementation of these follow-up activities. The details of Ghana's input are virtually the same as the Main Phase.

The nationwide dissemination of irrigated farming techniques through the implementation of

Table 1-7 Input from the Japanese Side

Input item	Description
Dispatch of long-term experts	Chief advisor; coordinator / training; cultivation; farmers' organizations / farming
Dispatch of short-term experts	Total: 9 persons
Provision of machinery and equipment	Spare parts, etc., for equipment provided
Counterpart training in Japan	Total: 4 persons
Share of local costs	Approximately JPY 34 million

Source: Created by author

Table 1-8 Examples of the Achievements of the Follow-up Cooperation

<p>Formulation of technical guidelines</p> <p>Guidelines on irrigated farming techniques were formulated as a complete summary of Japan's previous technical cooperation. Its contents were comprised of water management for irrigation, the operation and maintenance of facilities, cultivation (paddy rice farming, and vegetables), agricultural machinery, and farming/farmers' organizations. The guidelines on irrigated farming techniques were the first of their kind, not only for GIDA, but for Ghana as well. The guidelines with many photos and charts were available to be used by site project managers and agricultural extension officers effectively for the guidance of farmers. 1,000 copies were printed, and they began to be used as training materials in the irrigation districts under GIDA's jurisdiction, and also small-scale irrigation districts overseen by regional administrations.</p> <p>Formulation and the subsequent implementation of strategic plans for the betterment of farming</p> <p>This strategic plan was formulated based on the achievements of "Farmer Participatory Workshops," which were held in all the 22 irrigation districts throughout Ghana. In the workshops, farmers themselves first confirmed needs and issues for the amelioration of farming, and then drew up necessary action plans (short-term and long-term). The action plans described "who should take action, and when and how they should take action." Through the process, great efforts were also made to overcome the adverse effects of a top-down approach which was a conventional development method, and to promote Ghana's irrigated agriculture from the bottom up. Each of the action plans was different in content, but most regions gave their purposes as strengthening their farmers' organizations, increasing the yields of their agricultural products, reducing their production costs, improving their farming techniques, and joint shipping. The action plans began to be implemented half a year into the follow-up cooperation, and many outcomes were achieved. These outcomes included an increase in farming-related revenues (some irrigation districts achieved a 2-fold year-on-year or more increase in revenues due to joint shipping and increased productivity), an increase in collection rates for irrigation service charges, and the revitalization of activities by farmers' organizations. The efforts for the advancement of irrigated agriculture using a bottom-up approach, through the formulation and implementation of these strategies, were the first ever taken in Ghana. The impact they imparted were not only technical in nature, but were also organizational and systematic.</p>

Source: Created by author

training and workshops was also one of the focuses of the follow-up cooperation. The total number of people participating in the training and workshops that were designed mainly for farmers from all the 22 irrigation districts nationwide reached approximately 5,500. Previously, farmers around the nation had barely had any chance to acquire skills and techniques, so the dissemination of technology through direct guidance had a great impact, and the increases of crop yields and other tangible achievements were attained. From the perspective of CD, the follow-up cooperation had significant effects on human resources development for all the irrigation districts (especially for farmers), the building of farmers' organizations, the formulation of technical guidelines and action plans for the betterment of farming,

and the creation of a nationwide framework for the advancement of irrigated agriculture through support for the implementation of those guidelines and action plans. In other words, we could also say that frameworks were built and some efforts were taken toward the overall goal of the project-type technical cooperation that began in 1997, namely to “improve farming systems for each irrigated agricultural district under the jurisdiction of GIDA.”

(5) “Project for Improving the Farmer Participatory Irrigation Management System” (New project from 2004 to 2006)

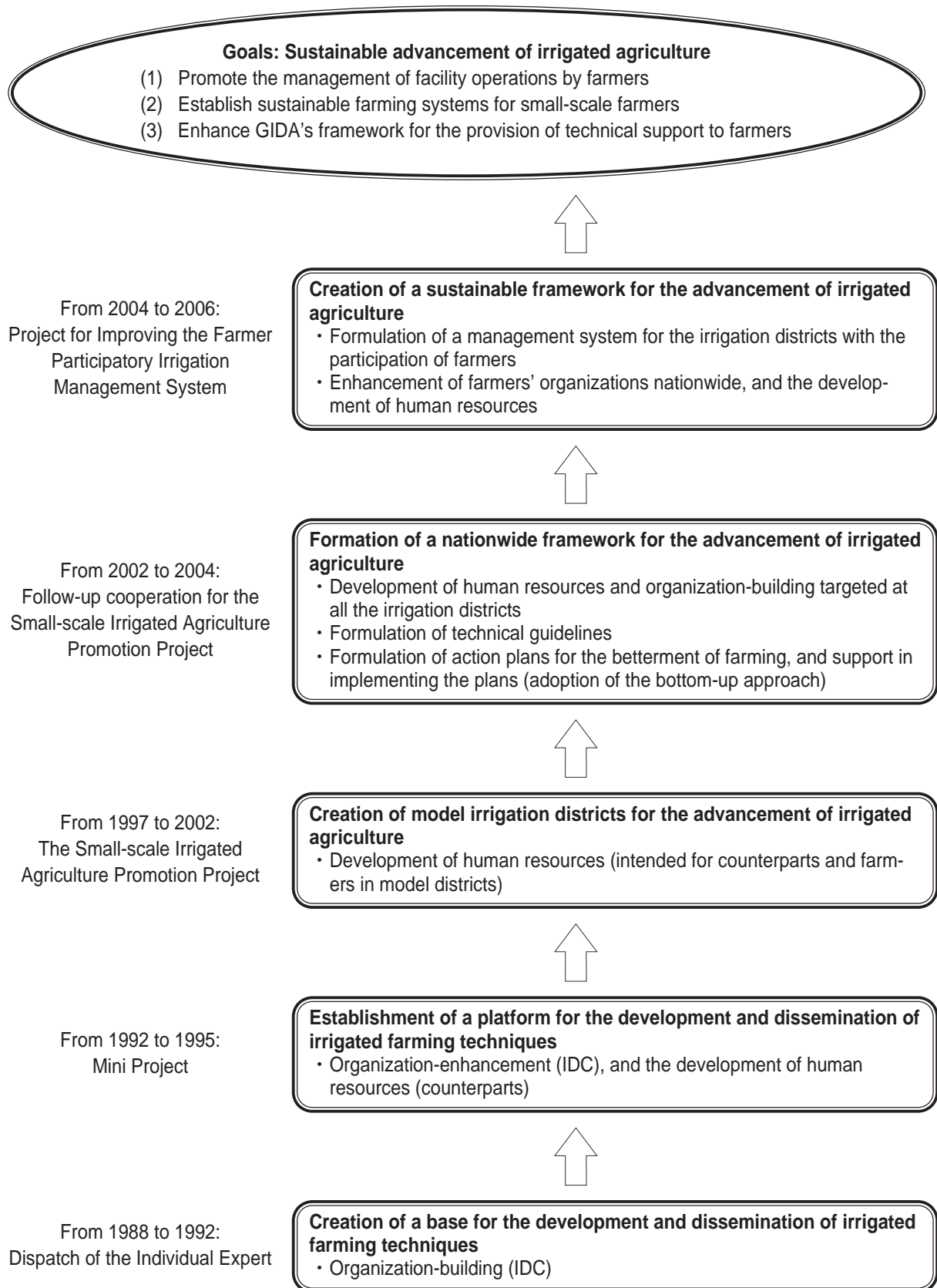
While activities were being expanded in all 22 irrigation districts across Ghana as part of follow-up cooperation for the “Small-scale Irrigated Agriculture Promotion Project,” relevant parties became aware of a significant issue related to Ghana’s irrigated agriculture. The issue was the “inadequacies of the management system of the irrigation districts.” As previously discussed, during the early 1990s, Ghana introduced the “Participatory Irrigation Management,” whereby farmers’ organizations would assume responsibility for the management of the facilities. However, since the system necessary to raise the efficiency of that management remained undeveloped, the responsibility for the management of the irrigation districts remained in limbo, and this caused a major factor for a decline and a slump in Ghana’s irrigated agriculture, as well as a lack of its sustainability. In other words, the concerned parties became aware of the problem that there were no actual frameworks aimed at the advancement of irrigated agriculture. It became evident that, without these frameworks, there would be no prospects of the sustainability or dissemination of achievements attained through the technical cooperation.

Following this sequence of events, it was decided to implement the “Project for Improving the Farmer Participatory Irrigation Management System” scheduled to start in 2004 and complete in 2 years. The project purposes are to “improve a framework for the implementation of the participatory irrigation management based on the new system,” and to “enhance the role in guidance for irrigated agriculture of GIDA.” Specifically, the activities being implemented include the formulation of a proposal for a system that includes the conclusion of an agreement document on the management of irrigation facilities between GIDA and individual farmers’ organizations throughout Ghana, training for farmers, and support for the implementation of action plans for the betterment of farming. Once again, from the perspective of CD, this new project is designed for technical cooperation for the development of systems, manpower and organizations for the sustainable advancement of irrigated agriculture (both manpower and organizations are targeted at farmers’ organizations in all the irrigation districts across Ghana).

(6) Summary

Figure 1-3 shows a summary of the changes in JICA’s cooperation that have been discussed thus far. If viewed from the present perspective, as demonstrated in Figure 1-3, we can see that, since 1988, Japan’s technical cooperation has provided constant support for Ghana toward the goal of the

Figure 1-3 Overview of the Transition in JICA's Efforts for Technical Cooperation



Source: Created by author

“sustained advancement of irrigated agriculture” in spite of the interruption of several years along the way. As a result of this support, a number of concrete outcomes have been delivered with regard to organization-building (technology development center, and farmers’ organizations) and human resource development (counterparts and farmers) that are essential for the advancement of irrigated agriculture. Furthermore, based on the outcomes of these cooperative efforts, further cooperation for “institution-building” is now being implemented to create a sustainable framework for irrigated agriculture. Nevertheless, questions remain as to whether the step-by-step progress of the cooperative efforts over the 16 years has progressed systematically from the very beginning, and as to whether there has been a different way to produce effects more effectively. Furthermore, although various experts have been involved, doubts remain whether their goals and approaches have been consistent, and what extent contexts have been maintained.

In Chapter 2, we will present a detailed analysis of goals and activities undertaken at each phase of technical cooperation, and that of actual approaches taken and their outcomes. We will then summarize this step-by-step flow of technical cooperation once more. Then, in the subsequent Chapter 3, we will analyze these issues in light of local circumstances.

Chapter 2

Characteristics of Each Phase of JICA's Cooperation

Aim of this chapter: JICA has proceeded with technical cooperation projects for the support of the advancement of irrigated agriculture in Ghana for 16 years. This chapter will break down the projects into 4 phases, then diagrammatize their aims as well as the content and approaches of activities, uncover the features of each phase, and subsequently examine their results and effectiveness. Furthermore, in this chapter, we will rearrange these chronologically in order to understand the actual conditions of phased flows.

2-1 Issues to be Examined, Methods and Points for Consideration

2-1-1 Issues to be Examined

Chapter 1 took a broad view of JICA's efforts for irrigated agriculture in Ghana. In this chapter, we will classify these efforts into 4 phases (of certain durations) according to periods and schemes, and examine the effectiveness of the efforts in each phase. In this research, JICA's efforts are classified under the concept of phases (as per Table 2-1) because of their readability, without using official names. The term "phase" refers not only to "duration", but also to a concept of a duration or stage with certain purposes or characteristics. Starting in 1988 with the dispatch of an individual expert, and finishing in 2004 with the conclusion of the SSIAPP (Small-Scale Irrigated Agriculture Promotion Project) follow-up, the direct purposes of each phase changed. However, JICA has continued to provide support under its long-term consistent theme, "technological support for the advancement of irrigated agriculture in Ghana." At the same time, the direct aims of this support and the approaches taken can be seen different for each phase. With regard to the "Project for the Promotion of Farmer Participatory Irrigation Management" (2004-2006), which is currently in progress, it is still at its early stage of the project, and its activities have not been clarified at the research investigation stage, so this phase has been excluded from this analysis.

The approaches taken in the 4 phases are typical approaches adopted by JICA for its support activities.³ Even today, JICA essentially takes similar approaches in the countries it provides support though their content and backgrounds may somewhat different. The subject of this chapter is to comprehensively assess the typical approaches taken in each phase, and examine their overall impact in consideration of connections among the phases.

³ According to Mabuchi (2005), the typical models of JICA's technical cooperation are "local society empowerment", the "core function development", and the "policy and institution development". The Mini Project Phase can be positioned as a "core function development", the Main Phase as a "local society empowerment", and the Follow-up Phase as "policy and institution development."

Table 2-1 Classification of the Approaches Taken in Each Phase

Implemented years	Phase	Approach	Official Name and Description
1988 ~ 1992	Individual Expert Phase	Individual base approach	“Dispatch of Individual Expert to GIDA” Individual expert is dispatched to counterpart organizations in order to build a base for technical support and ensuing full-scale support through an individual and flexible approach.
1992 ~ 1995	Mini Project Phase	Core function development	“Ghana Irrigation Development Center Project” Activities related to research and training in accordance with certain themes are conducted centering on a center which is to become a central facility for technical support.
1997 ~ 2002	SSIAPP Main Phase	Local society empowerment approach	“Ghana Small-Scale Irrigated Agriculture Promotion Project” Model districts are marked, and models for ideal development are established and presented as pilot projects.
2002 ~ 2004	SSIAPP Follow-up Phase	Long-term strategic approach	“Ghana Small-Scale Irrigated Agriculture Promotion Project Follow-up” Regional strategies and an associated framework are created with an emphasis on each locality with a view to developing them nationwide from the outset.

Source: Created by author

For this purpose, it will be necessary to clarify the following viewpoints on the approaches taken in each phase:

- What was the background that led to the phase being implemented?
- What were the aims of the phase?
- How was the phase approached?
- Were the intended results achieved?
- Were there any unintended results or negative impacts?
- Were there any points of reflection or problems?
- How was each phase linked to the next, and what kinds of effects did each phase have?

In addition to the above analysis, we will list the 4 phases in chronological order, and conduct a longitudinal analysis from an overall perspective as below:

- What were the characteristics common to each phase?
- What were the changing characteristics in each phase?
- What were the links connecting each phase?

This chapter goes no further than comprehensively understanding an overall picture of the cooperation of 16 years. In Chapter 4, we will proceed with an examination from the perspective of CD, which is the subject of this research, based on the results of field studies outlined in Chapter 3.

2-1-2 Method of Examination

To examine the effectiveness of the approach taken in each phase, it is important to first clarify

“What was JICA originally attempting to achieve?” and “How did they try to achieve this?” before analyzing the results (degrees of achievement). Then, in addition to the achievement of the original goals, it is also important to analyze the various positive and negative impacts experienced during the process of the activities. Consequently, the sequence of our examination is as follows:

< Examination Sequence >

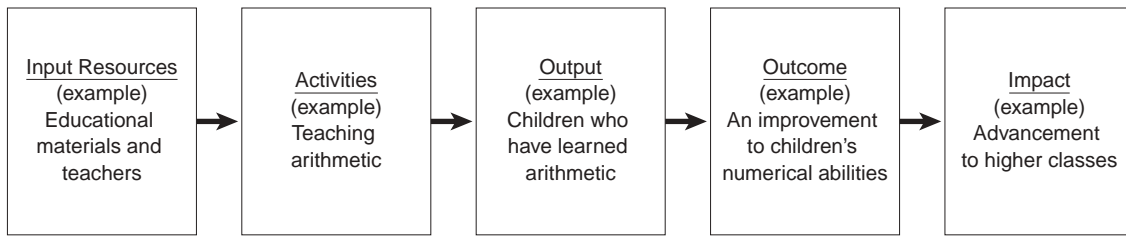
What was JICA initially aiming to achieve?	(Initial goal)
How did JICA attempt to achieve the goal?	(Method of achievement)
Was the goal fulfilled?	(Goal attainment level)
What impacts were generated during the process of trying to achieve the goal?	(Positive and negative effects)

The flow is similar to the examination taken in the so-called “project evaluation” conducted by JICA. However, in this examination, areas not shown in the so-called “logical framework (logframe)” (or project design matrix (PDM)) were also emphasized. Furthermore, in addition to the project, the dispatch of the individual expert was examined by the same method, and an emphasis was placed on a comprehensive and long-term analysis from the viewpoint of technical cooperation. In conducting a comprehensive examination, sufficient analysis cannot be made by just tracking the goal attainment level, or the content of activities. Particularly in JICA’s case, the means of cooperation is technical cooperation, which is an extremely complex and dynamic entity. It does not just involve training, On the Job Training (OJT) or any other actual activities, but also various elements, including a systematic organization for implementing those activities, work practices for the organization, and ways for implementing the activities. In technical cooperation, people do not only act as a central means of cooperation, but they are also the very ultimate beneficiaries of support as well as the appliers of technology in the field. Effects on people working as media are not unilateral but bilateral and complex, and they change according to various factors. Incorporating these factors into analysis is difficult, however, any examinations would be incomplete without the factors.

The examination method adopted this time for the comprehensive analysis of the effects is the diagrammatization of the approaches of each phase, and the examination of the effects based on the diagrammatized approaches through the application of a “logic model.” A logic model is applied to public policy programs and projects, and maps out correlations among input resources, activities, intended results (outcomes and impacts). Figure 2-1 shows a simple example with a basic diagrammatic relation.

In the case of the example of Figure 2-1, “teachers” use certain “educational materials” to “teach arithmetic” to certain children, in the expectation of them being some help in “advancing them to higher classes.” In several hours, “children will learn arithmetic” as a natural result, and “their

Figure 2-1 Example of a Basic Logic Model



Source: Created by author

numerical abilities will improve” as an intended result, so the previously mentioned “advancement to higher classes” might possibly be fulfilled. This is a simple logic model. This logic is only based on an initial intent, so it is unclear in the planning stage whether this logic can be turned into reality. It is necessary to examine such questions as to whether the input “educational materials” exist, whether activities are sufficiently conducted, and whether numerical abilities are improving as a result of learning the arithmetic. An arrangement like this with the use of a chart makes it relatively easy to examine as to what extent aims have been realized (a degree of achievement), what their reasons are (analysis of causes), and what action should be taken from now onwards (modifications and improvements).

The logic model was developed by J. S. Wholey et al. of the Urban Institute, a policy think-tank in the US during the 1970s, as a model for evaluating policies, and it has now established itself as a standard tool for policy evaluation and policy management. Incidentally, a way of thinking for the logic model is also applied to a project logframe (PDM), which is organized in a tabular form. Logic models are useful to sort out and analyze broad and complex structures like policy programs. They can also be applied more flexibly to projects in comparison with log-frames when one wants to understand projects from a more comprehensive perspective. In addition to the box-type structure of Figure 2-1, logic models can also be presented as flowcharts (arrow diagrams) that express structures systematically using arrows.

In this study, in order to not only map out the project activities and objectives, but to comprehensively map out the project structure - from the organizational structure and the methods for conducting activities (approaches), to secondary aims such as the transfer of technology, we have further expanded the flowchart-type (arrow diagram-type) logic model, and created a “comprehensive logic model.” We are able to analyze a project comprehensively by arranging organizational structures, activity methods, and other important potential items which are not clearly defined in planning, in addition to “explicit” items, such as from inputs to activities and results.

The following describes each box in the flowchart.

“INPUTS”: Human resources, materials, equipment, and administrative costs, etc. which are required

to conduct the relevant activities.

“ACTIVITIES”: Outline of activities - not a detailed description of individual activities, but an outline of a series of activities.

“RESULTS within Project”: The logical rearrangement of the intended results (i.e. objectives) of the activities into an array of effects, from direct to indirect. A collection of objectives intended to be achieved during the term of the project (or during the dispatch of personnel). The furthest left objective is the most direct objective, and the furthest right objective is the ultimate objective (project purpose) to be achieved during the term of the project.

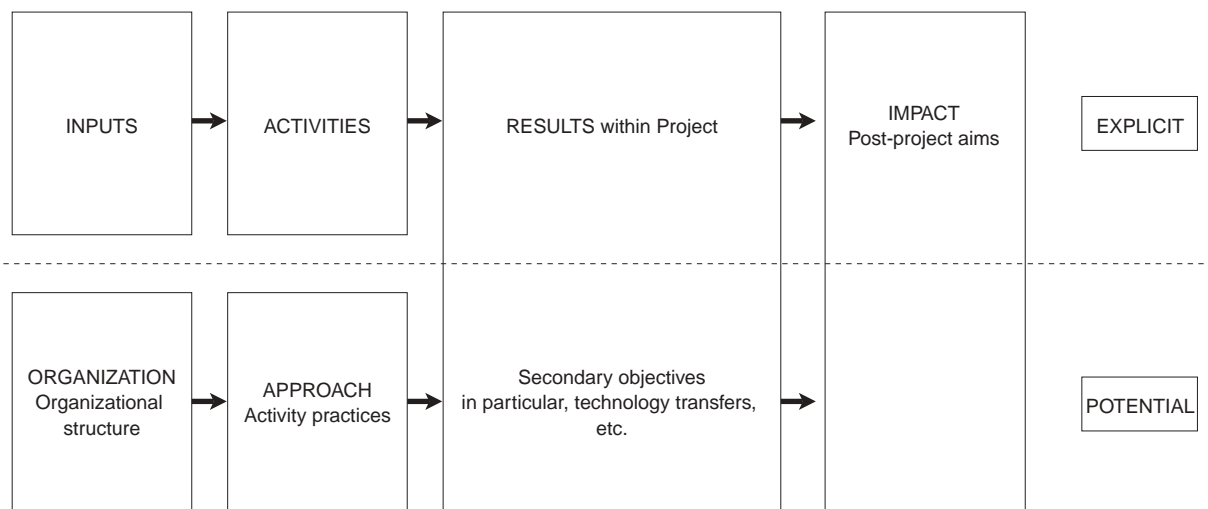
“IMPACT”: The objectives intended to be achieved, attributable to the indirect effects subsequent to the conclusion of the project term (or the term of dispatch).

“ORGANIZATION”: Characteristics of the organizational foundation or framework on which activities are to be conducted, including the allocation of personnel, organizational restructuring and mode of operations. Not an outline of the official organizational chart, but an emphasis put on a description of a substantial implementation structure.

“APPROACH”: Characteristics of the daily operational processes, including work practices, management policies and work styles.

The abovementioned “ORGANIZATION” and “APPROACH” have not been clearly expressed in the written plan, but they have the potential to have a significant effect on achieving the objectives of the technical assistance. The strengthening of the organizational framework and capacity enhancement for counterpart personnel have not been clearly expressed in the log-frame or other official plans, but they have also been designed as important objectives as the project purpose. In such a case, it is also important to conduct analysis from the perspectives of ORGANIZATION and APPROACH. As for

Figure 2-2 Configuration of a Comprehensive Logic Model



Source: Created by author

these implicit but important elements, it is necessary to clarify their initial intent through other relevant documents, and interviewing with relevant parties. In the comprehensive logic model, we have organized these elements as “POTENTIAL” elements.

Now we would like to draw attention to the differences between the PDM (or the log-frame), and the logic model that is being created in this instance. In many cases, current official PDMs that are developed at the start of projects become vague. Current PDMs are not necessarily suitable for a comprehensive analysis. (Furthermore, there are no PDMs for the activities of the individually dispatched expert.) In addition, there is also limitation to PDMs as tools due to limited sections for describing only one project purpose, and the outcomes of interim objectives respectively. Because of this, there are some instances where secondary objectives and other original intentions are not shown. Accordingly, in preparing the comprehensive logic model in this instance, we have referred to existing PDMs and other resources, but we have reprepared them based on the opinions of the major project operators. Consequently, we would like you to be aware that there may be descriptive and other differences with the existing PDMs.

2-1-3 Research Process

In our research, we divided JICA’s assistance that was started to be given to Ghana’s irrigated agriculture in 1988, into 4 phases. We organized the approaches taken in the respective phases into a comprehensive logic model, and explored the achievement of the initially designed objectives and the associated positive and negative effects.

Research was conducted using the following procedure:

The authors constructed a prototype of the comprehensive logic model from existing documents and other resources.

Confirmed the relevance of the logic model with the main people involved at each stage (the individually dispatched expert, and project leaders).

Surveyed the degrees of achievement for each objective, and the impacts, using existing documents, and from questionnaires and interviews from relevant persons.

Based on the results of the survey, confirmed the degrees of achievement for each of the designed objectives as well as the positive and negative impacts.

Located and analyzed the factors that contributed to the objectives being achieved, and to the impacts being generated based on the logic model.

Furthermore, in order to delve deeper into the degrees of achievement and impacts, we traveled to Ghana, and conducted on-site interview surveys. The results of each survey are described in Chapter 3.

2-1-4 Points for Consideration

The first stage in our analysis began with organizing JICA's efforts for technical assistance that started to be given for the advancement of Ghana's irrigated agriculture in the 1980s. However, the fact that there is extremely limited referable material available can be cited as a constraint of this first stage. The actual number of reports is small, and most of the existing reports on the respective phases are of the type that report on what have been achieved in completed projects. Hardly any of the reports contain descriptions related to processes for solving problems, or events at intermediate steps taken in each phase. Furthermore, there are few opportunities to access interim reports or reports of individual experts, and most of these are similarly preoccupied with reporting on achievements. Consequently, in this research, we made direct contact with then major project leaders, and reconfirmed their objectives and approaches set forth at that time. Based on this, we created a logic model to form the basis of our analysis, and collected key information.

Another constraint for this research has been the fact that the analysis has been based on qualitative information dependant on existing materials and statements provided by people involved in the projects. For this reason, analysis did not extend as far as verifying the so-called quantitative effectiveness of the projects. Naturally, quantitative effects could be artificially demonstrated by using regression and other similar forms of analysis. However, this research was confined to qualitative analysis because the primary theme of the research has been the examination of fields to which quantitative analysis is not receptive to begin with, such as technology transfer and CD, and in view of the fact that the research has been improvement-oriented in order to clarify future problems.

Although this research has ended up being an analysis and evaluation, from the present perspective, of JICA's assistance that was previously provided in each phase, we would like to reiterate that this research has been nothing more than improvement-oriented for the purpose of examining effectiveness and demonstrating the direction of future improvements, rather than criticizing specific individuals or organizations that were involved in each phase.

2-2 Individual Expert Phase (from 1988 to 1992)

2-2-1 Overview

JICA's efforts to assist in the advancement of Ghana's irrigated agriculture began with the dispatch of an individual expert in 1988. The actual input of human resources was small in size, being one long-term expert and several JOCV members. Despite the size, during this period, they were able to establish a center with research and training facilities (IDC). This center laid a basis for the development of the so-called "core function development" project which focused on research during the ensuing Mini Project. Furthermore, the Individual Expert Phase had a significant impact on the direction of JICA's subsequent assistance for irrigated agriculture in Ghana, including during the Main

Phase (from 1997 to 2002) when the IDC was central to research activities.

2-2-2 Initial Intent and the Implementation Process

Figure 2-3 sets out the initial intent and implementation process during this phase into a logic model. The characteristics of this phase are as follows:

- An unclear initial purpose and strategy for dispatching
- A grand concept for a research center in anticipation of technical cooperation projects 10 years afterward
- The 3 pillars of activities: the establishment of a center, research activities, and training
- A “team” with 1 expert
- The powerful leadership of the expert
- The incentive of training in Japan
- No intervention into the salaries and wages of Ghanaian personnel

(1) An unclear initial purpose and strategy for dispatching

With respect to the efforts during the Individual Expert Phase, there are no documents (for example, PDMs) that explicitly define the initial intent. The statements made here on the initial intent are based on the interview conducted with the actual expert who was dispatched. First, one important fact is that the instructions issued from JICA headquarters to the dispatched expert were very broad: “assistance in the advancement of irrigated agriculture through GIDA.” Strategies, such as how to achieve this broad goal, and the question of what kind of approaches should be undertaken by the individual dispatched expert, were largely left up to the discretion of the expert himself. While naturally obvious steps were taken, such as coordinating with JICA headquarters and other involved persons, fundamentally, the initial intent stated here was formed at the discretion of the expert himself after he had conducted investigations for about 1 month following his dispatch to the sites. The sort of “super goal” to assist in the advancement of Ghana’s irrigated agriculture had been set, but there was a lack of any clear strategies directed toward this goal. This feature was not restricted to this initial phase, but rather the trend ended up continuing through the Main Phase.

(2) A grand concept for a research center in anticipation of technical cooperation projects 10 years afterward

After about 1 month of investigations, the expert reached the conclusion that he should aim for the establishment of a “research center” that could form the basis for technical cooperation project 10 years later. In order to revitalize Ghana’s irrigated agriculture, which was battered at that time, what was needed more than new development were improvements to existing facilities and their efficient operation through maintenance. And for this purpose, technology development suitable for Ghana was needed. Furthermore, at that time, GIDA, to where the expert was being dispatched, was in such a weakened state that staff did not even have enough desks for them. GIDA’s cohesiveness as an

organization was also weak, and at a low level technologically. Consequently, the objective was to strengthen GIDA's organization, and moreover, aim to improve Ghana's irrigated agricultural technology by building a "research center" within GIDA to become the core for GIDA's technology development, and by ushering in JICA's technical cooperation projects 10 years later. Since the center was to incorporate research facilities, as well as a library and training facilities, the grand concept for the center was to make it a core technological facility for Africa's irrigated agriculture so it could be used not just for Ghana, but in the future as a venue for the third-country training. In terms of the scope of the research, it was viewed that rice cultivation alone would not be effective, so lucrative crops, including vegetables and flowers, were also targeted. Furthermore, it seems that the aim of the center was not just for pure agriculture, but for more broad-based research, including the development of the environment by creating forests around the Ashaiman district where the research center was to be located. This concept of a "research center" was conceived by the expert, and was approved after it had been explained to the relevant people at GIDA - the counterpart organization. The research center was named the "Irrigation Development Center (IDC)."

(3) The 3 pillars of activities: the establishment of a center, research activities, and training

The 3 main activities in preparation for the establishment of the research center were the "establishment of the actual center," "research activities at the center," and the "training of counterparts." The ultimate aim was not only for the establishment of the center, but for the IDC to be able to run research activities independently by conducting research activities there, and by simultaneously running various types of training for the counterparts. Counterpart training also included training in Japan. The aim of this was to develop human resources, and to raise staff motivation. In addition to the establishment of the center, an approach was taken for the long-term development of an organization through the counterpart's activities in the center (a kind of OJT type of organization development). This was also true of JICA's other technical cooperation projects, and it could be argued that it was characteristic.

(4) Input: A "team" with 1 expert

With respect to "Input," human resources input was essentially the 1 expert from the individual dispatch. (The dispatched expert specialized in farming, not necessarily in irrigation.) In addition to this, JOCV from the fields of forestry, rice cultivation and farming were involved in providing support. From the counterpart organization GIDA, personnel for the research center were assigned through public application. In terms of the input of physical resources, Japan was to provide a range of research equipment and materials, and funds to cover the construction costs of the research center. Ghana was to provide land in the Ashaiman district, which is one of the irrigation districts near the Ghanaian capital of Accra, as a site to build the research center.

(5) The powerful leadership of the expert

In the time leading up to the actual establishment of the IDC, the individual expert, who was dispatched to GIDA, issued instructions, and promoted a series of processes to establish the IDC, from the construction of facilities to the allocation of equipment, materials and human resources. Following the establishment of the IDC, the center was positioned as one of GIDA's sub-organizations, and the individual expert assumed the position of Director General of the IDC. New applications were called for IDC staff (researchers and office staff).

The expert had been devising strategies, and guiding overall activities through their leadership since before the establishment of the IDC. The expert also believed from experience that as long as he exercised this kind of leadership, things would proceed forward. It was also thought that, through the Japanese issuing instructions, the transfer of technology would proceed more efficiently in the aspect of management. Furthermore, although the everyday office work was left up to the Ghanaian staff, the Japanese style of management was adopted for occupational rules such as the management of staff attendance. For example, the cleaning of the IDC yard was done by all the staff. The practice of providing staff with the opportunity to experience Japanese-style management was also intended to contribute to the development of human resources which would be the base of the IDC organization. On the other hand, once a rule had been decided, the implementation of that rule was left up to the Ghanaian staff, and the management of activities was done by the IDC, not by GIDA headquarters. In this way, attention was given to promoting independent organization-building at the IDC.

(6) The incentive of training in Japan

In addition to training provided for IDC research staff at the IDC, technical training was also provided for some IDC staff in Japan. In addition to the direct purpose of technical improvements, the training also aimed for the staff to see for themselves the ideal methods of management in Japan, including Japanese culture. Furthermore, as a managerial goal at the site, the staffs were told that outstanding personnel would be provided with training in Japan in order to raise their motivation as an incentive.

(7) No intervention into the salaries and wages of Ghanaian personnel

No donor-sponsored incentive payments were made to counterpart personnel for daily allowances or special allowances, as seen with other donors. This practice was not unique to this phase. In principle, in projects run by JICA, the payment of counterpart wages and salaries are seen as a matter of the partner country, so JICA does not involve itself in such a matter. Primarily this is an issue of inputs. In terms of JICA's stance on emphasizing sustainability, not supplying any allowances is very much JICA's aid policy. This is because the payment of special allowances or daily allowances to counterparts would naturally cease once the project has been implemented. So because of this, sustainability would simultaneously vanish at the conclusion of the project, and there is a fear that such

payment would otherwise be conducive to further dependence on aid. In this phase as well, the policy was adhered to, and the abovementioned training in Japan was offered as an incentive, without any such monetary payments made to counterparts.

2-2-3 Results

Activities were implemented during this phase based on the logic shown in Figure 2-3, and the following results were generated:

- Establishment of the groundwork for the research center (IDC)
- Dissemination of the Japanese-style management to the counterparts
- Lessening of the compensatory motivation for counterparts
- Opposition to the incentive of training in Japan
- The 10-year plan that was achieved, and the vision for the future that was not passed on

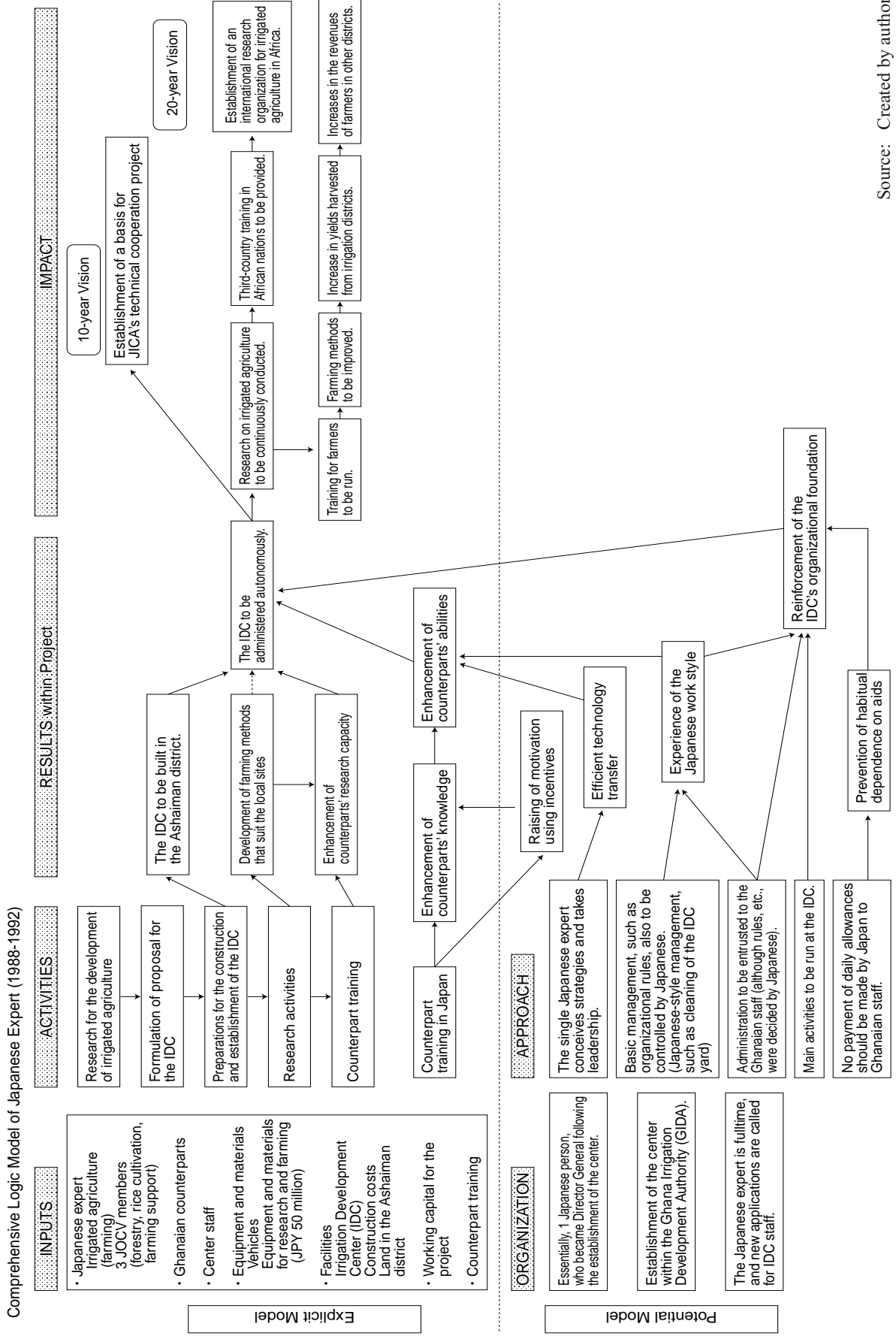
(1) Establishment of the groundwork for the research center (IDC)

The research center (IDC) was established, as originally intended. This facilitated not only the allocation of facilities and human resources, but also the establishment of a research organization that could deliver research activities of a certain level as a result of receiving a range of research and training, including training in Japan, subsequent to the establishment of the organization. A long-term research program was drawn up in order to demonstrate the direction of future research at the IDC. Furthermore, an organizational operations manual that also covered administration was also prepared for the IDC. In actual fact, the IDC was inherited, without change, for the center's projects at the subsequent Mini Project Phase, and the research and training activities of the Mini Projects were conducted at the IDC. From this perspective, it would be fair to view that the establishment of an organizational foundation was achieved as originally intended.

(2) Dissemination of the Japanese-style management to the counterparts

The Japanese-style management taken during this phase did produce effects to a certain extent. According to evidence given by the expert himself, it appears that practices, such as yard cleaning by all the staff, did enhance the work attitude of the counterparts, and the management of staff attendance was able to be independently controlled by the counterparts. Furthermore, according to questionnaires given to the counterparts, many of them cited "punctuality" and "devotion to work" as things they learnt from Japan. It would appear that the Japanese management policies, which sought not just technological improvements but psychological improvements to generate technology as well, were spreading throughout the counterparts. However on the other hand, regardless of the fact that there are differences between Ghana and Japan, we did come across some opinions in the survey that opposed the imposition of the Japanese way of work. From this fact, we think it would be difficult to judge that the Japanese style of management was necessarily accepted 100 %.

Figure 2-3 The Logic Model (Initial Intent)



Source: Created by author

(3) Lessening of the compensatory motivation for counterparts

Judging from reports from the experts, and the results of questionnaires, the motivation of the counterparts tended to decline because salaries and wages for the Ghanaian counterparts were low and often in arrears. In principle, JICA does not pay any wages or salaries to counterparts in all the JICA's projects, not just for the JICA projects in Ghana. On the other hand, in many other donors' projects, they often pay wages and salaries as an incentive to their counterparts. The amount of wages and salaries they pay is often high in countries like Ghana, where wage standards are low. In particular, in Ghana, where wages are routinely low and/or in arrears, the effect is extremely pronounced. During this phase as well, Ghana was in a similar situation. As a result, though counterparts did not go as far as boycotting, the result was that their motivation toward work was declining.

(4) Opposition to the incentive of training in Japan

In order to cover disadvantageous wages mentioned in (3) above, and to raise the motivation of the counterparts, JICA had explicitly used training in Japan as an incentive. The outcome was that a sense of competition was produced among the counterparts. On the flip side, the expert himself felt responsible for a sense of unfairness and conflict generated among some counterparts because they offended against a process under which the counterparts competed with each other for the training, which was awarded like a prize, and decisions were made at the discretion of the expert. Naturally, for the expert, this process arose from the intention of wanting to maximize the effects as an incentive, and similar approaches were taken in many other JICA projects. However, on the contrary, depending on how the practice was utilized, it could be conducive to a superior-subordinate relationship in a negative sense. This could result in antagonism among the counterparts, and could also involve a risk of leading to a decline in motivation from the sense of unfairness. In this instance, while things did not appear to descend to such severity, it is a valuable example that demonstrated the risk of offering training in Japan as an incentive.

(5) The 10-year plan that was achieved, and the vision for the future that was not passed on

The experts' medium-term objective in relation to the establishment of the IDC was for it to accommodate JICA's technical cooperation projects in 10 years. Immediately following this, the Mini Project began, and then the Main Phase of the technical cooperation project commenced. So in this context, it can be viewed that the medium-term objective was successfully achieved. However, the original long-term future vision for the IDC was for it to become a research base in the advancement of Ghana's irrigated agriculture, accommodate training for third countries, and become a key research and training institution in Africa. Furthermore, there was a grand future vision that the subject of research would not just be limited to rice cultivation, but would extend to high-profit crops such as vegetables and flowers. Nevertheless, these concepts were not handed on to the next phase, and research was limited to rice cultivation. In the succeeding Main Phase as well, the focus was on rice. Furthermore, although the approach focused on technological improvements for the upgrade and maintenance of

existing facilities, there were major upgrades to facilities using grant aid in the district which became the site for the Main Phase, so the approach diverged from the initial intent. The future vision to develop the IDC ultimately into the center of research activities in Ghana and Africa was not passed down to the ensuing Main Phase. According to the evidence given by the expert, the reason was that, at that time, JICA, the Ministry of Agriculture, Forestry and Fisheries, and private sector consultants believed that irrigation should focus on cultivating rice with new developments. Also cited as a reason was the fact that communications with their successors were inadequate.

2-2-4 Analysis

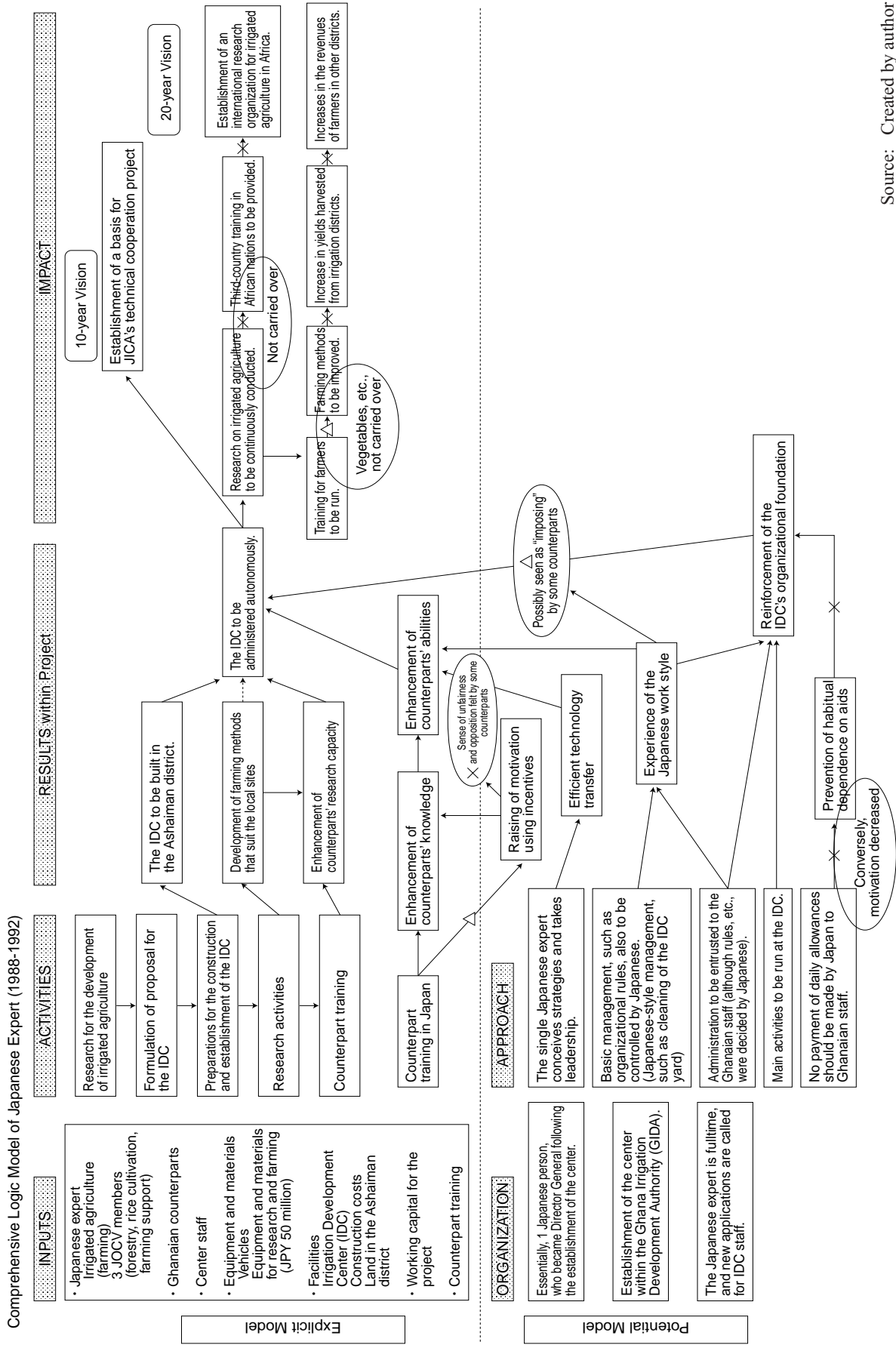
The following facts can be indicated from the relationship between the initial intent and the results in Figure 2-4:

- The effectiveness and problems of strategies formulated by the expert
- The effectiveness and problems of organization-building through OJT
- The effectiveness, efficiency and problems of Japanese-style management
- The effectiveness and problems of Japanese-style incentive

(1) The effectiveness and problems of strategies formulated by the expert

Having an overall “super goal” to advance irrigated agriculture in Ghana, but leaving matters up to the experience and skills of the expert, such as strategies for achieving the goal, and the targets and activities during the term the expert was dispatched, has effectiveness and, at the same time, leaves many problems. In terms of effectiveness, the expert is able to devise strategies flexibly and using his own discretion. By doing so, he can devise strategies that directly meet the needs of the local site according to changing conditions. Furthermore, his level of understanding of the strategies increases by starting with the strategy-building, and he is able to give cohesiveness to the corresponding activities. The expert also has an incredibly high sense of ownership of the strategies and the corresponding activities, and his motivation increases. Up until the IDC buildings were actually built, the dispatched individual expert purportedly worked in spaces without roofs on the planned construction site, and this shows just how much enthusiasm the expert felt toward his own activities. At the same time, there are many problems with this kind of strategy-building undertaken at the discretion of the expert. From what can be gleaned from this phase, strategies devised by the expert do not surmount his own individual specialties, and this means there is the problem that he cannot be linked to the next project or JICA’s next efforts. Naturally, to counter this, he communicate with the headquarters, and hand over to his successors, but the direction of the strategies themselves is changed ultimately without being taken over when an expert in charge is replaced by another expert. Furthermore, this kind of strategy-building through sole discretion depends largely on the quality and experience of the expert making those decisions. The direction singled out by the expert dispatched during this phase was to “create research facilities and an organization” and to “target not only rice cultivation but vegetables.” The question of whether this direction really was accurate in the long haul

Figure 2-4 The Logic Model (Follow-up Study)



Source: Created by author

was an important issue that naturally needed to be fully discussed and shared by the concerned parties. However, this was not satisfactorily achieved.

(2) The effectiveness and problems of organization-building through OJT

After the IDC facilities were provided and human resources were allocated, organization-building through OJT was carried out. Organization-building through OJT is intended to develop human resources and increase organizational capacity by implementing research activities and associated administration within the organization. It is effective to train personnel and the organization to become practical through the experience of actually running organizational activities. Because the organization actually became an entity to execute the Mini Project following this phase, and it is still functioning today as GIDA's research organization, it can be satisfactorily argued that this method has been fully effective. Meanwhile, the fact that this method is costlier and more time-consuming in comparison with a method of allocating already-competent personnel and incorporating an already-existent organization from the start is generally cited as is problem. However, in GIDA's case, because there were no such human resources or organization, the organization was basically built from scratch. Furthermore, in the case of building a new organization like the IDC, it was preferable to build a new organization steadily from scratch through specific work activities, such as drawing up rules, rather than providing classroom-type training. According to the counterpart surveys as well, the practical work methods of the Japanese and the methods of technology transfer were well received.

(3) The effectiveness, efficiency and problems of Japanese-style management

The inaugural Director General of the IDC was the individual dispatched expert. He issued instructions and promoted Japanese-style management. For example, he encouraged the management of staff attendance by using timecards, and promoted a sense of unity within the organization by having all the staff clean the IDC yard regardless of types of their occupations, whether they were researchers or office staff. The outcome of this kind of leadership by the Japanese expert was that the counterparts experienced the Japanese work style. Looking at the counterparts' responses to the questionnaire, it appears that they were impressed by the time-conscious, serious and business-like methods of the Japanese, and some of the counterparts cited this as being the thing that they most learnt. By demonstrating these kinds of Japanese methods, and allowing the counterparts to experience them, the counterparts knew how to react when they came in contact with Japanese in the ensuing projects. In this respect, the Japanese-style management was effective. Meanwhile, some of the counterparts were of the opinion that some experts were not aware of the differences between Ghana and Japan, and that they would not acknowledge the Ghana way of doing things, or that they mistakenly thought that Japan was superior to Ghana. Since there were some counterparts, who felt that the Japanese way of doing things was being imposed upon them, in particular this point remains a problem in terms of approaches.

(4) The effectiveness and problems of Japanese-style incentive

The Japan-style incentive is not monetary, but rather offers “training in Japan” as an incentive to outstanding counterpart personnel, thereby raising the motivation of the counterparts, and increasing overall effectiveness. As mentioned previously, from the perspective of sustainability, as a rule, JICA does not provide monetary compensation to counterpart personnel unlike some other donors. Meanwhile, the training in Japan is not just for counterparts to travel to Japan, but, for long-term training, some counterparts are able to cut back on living expenses, and return to Ghana with a certain amount of savings. In this respect, the training in Japan is in effect a very appealing proposition to the counterparts. Naturally, this is not publicly proclaimed, but there are also projects that utilize this training in Japan as a motivation tool. In terms of its effectiveness, it is essentially for training without simply providing money. So the counterparts can enhance their abilities, and really understand the Japanese and improve communications with the Japanese experts by traveling to Japan and learning about the real Japan. Actually, there were many counterparts who said that they had not been able to understand what the Japanese were saying until they undertook the training in Japan. Then again, there are also many problems. One of them is the fact that the objective of training is training, so the notion of training is still relatively weak as the direct incentive for counterparts that are financially troubled. Since the wages of counterparts in least developed countries like Ghana are low, any financial problems will be directly linked to their lives. Other donors, including NGOs, provide financial assistance, so in comparison, JICA gives the impression of taking a harsh action. Another problem is that, although motivation is sufficiently raised for some counterparts who are targeted for training, other counterparts who are not eligible lose their motivation. In this phase, the counterparts were told that outstanding personnel would be provided with training in Japan. But in view of this previous point, this led to the unintended consequence of producing a sense of unfairness. Though questions, such as how training in Japan should be treated in response to the primary objectives, are important issues, the key question remains of how to make full use of the motivation-enhancing effects for some counterparts.

2-3 Mini Project Phase (from 1993 to 1995)

2-3-1 Overview

A center with research and training facilities (IDC) was established through the dispatch of individual expert from 1988, and human resources were trained in the center. Subsequent to this, “core function development” project that focused on research was developed with the IDC as its base. During this phase, JICA’s development survey was also conducted simultaneously in the Ashaiman district, the irrigation district where the IDC was located. Furthermore, this was the period when Japan’s support for irrigation development in Ghana was initiated in earnest, including training being started for farmers in other districts outside Ashaiman. Further still, this was an important period when a substantial base was created for technical cooperation that would link to the next phase, and when the overall direction would be determined.

2-3-2 Initial Intent

Based on the understanding of the intent of this phase, the following are the characteristics of the initial intent:

- Positioning as a “core function development” project, and an unclear long-term strategy
- Start of practical research and dissemination to farmers
- Wide-ranging research themes
- Substantial prioritization of rice cultivation
- Shift in the control of management

(1) Positioning as a “core function development” project, and an unclear long-term strategy

The main objectives of the Mini Project Phase were to take over IDC, which was the research organization founded by the individually dispatched expert of the previous phase, and to conduct field research into Ghanaian irrigation, and training for counterparts and farmers in the Ashaiman irrigation district, where the IDC was founded. From a technological perspective, this phase aimed to enhance the capacity of the IDC so that it would be able to meet farmers’ demands for technological support in irrigation projects throughout Ghana. For technological improvement for the promotion of Ghanaian irrigation, a so-called “core function development” project was launched so as to conduct research and training at the IDC research body under the guidance of the Japanese experts. The views taken on the function and role of the IDC were similar to the earlier phase, but it seems the outlook for the future was not inherited. According to the results of the questionnaires received from the experts of the Mini Project Phase, it seems that the intended visions of the expert of the earlier phase were not carried over to this phase, namely the grand vision for the IDC to become a research organization central to irrigated agriculture in Africa, and the building of a base aimed at accommodating future technical cooperation projects. In actual fact, the experts stated that they “did not expect” things to develop as far as technical cooperation projects. This point shows that, this new phase was somewhat clearer as to what was to be achieved at the IDC in comparison with the earlier phase. However, on the other hand, it had become vague on such strategies as to how their actions would be subsequently linked to the overall improvement of Ghanaian irrigation.

(2) Start of practical research and dissemination to farmers

Research at the IDC emphasized coordination between each of the research divisions (soil, rice cultivation, horticulture, the environment, agricultural machinery, and water management) and the production division in the Ashaiman district. It emphasized practical research in the field, not mere research. Furthermore, though the training of farmers had been conducted in patches since the earlier phase, this became one of the foremost components of activities during the Mini Project Phase. Training centered mostly on the Ashaiman district, where the IDC was located, however, technical assistance for rice cultivation (chiefly training) was also expanded into other districts including Kikam, Kpong and Dawhenya. This pattern of accumulating practical knowledge through field research, and

then providing training designed for dissemination of that knowledge is the standard approach adopted in JICA's "core function development" technical cooperation projects. This approach was first adopted during the Mini Project Phase, and it became a dominant component of activities during the Main Phase of the subsequent technical cooperation projects.

(3) Wide-ranging research

The research laboratories established in the IDC at that time covered a broad range of fields: soil, paddy rice farming, horticulture, agricultural machinery, water management, and agricultural environment. However, there were actually only 1 or 2 Ghanaian researchers in each research laboratory. Specialized experts were not assigned to each and every research laboratory, so actual technical guidance was provided partly by the JOCV members. As for the reason to set these broad-ranging research disciplines despite originally having limited human resources, it is conceivable that the research laboratories were set up to cover the array of issues, with the aim of nationwide expansion in the future. It is quite evident that the intention was to coordinate these broad-ranging disciplines in collaboration with the production division, but conversely, there was no evident intention to collaborate with other agricultural research institutes outside of the IDC, such as the National Institute of Crop Science, the Soil Research Institute, the Savannah Agricultural Research Institute, or the University of Ghana.

(4) Substantial prioritization of rice cultivation

Although the research laboratories were broad ranging, in actual fact, the disciplines for the advancement of irrigation were highly focused on the cultivation of rice during the Mini Project Phase. Rice cultivation was the main area of guidance, not just for the Ashaiman district, but for other districts as well. The title of a seminar in 1994 was the "Seminar on the Cultivation of Rice," and it did not include high-profit crops such as vegetables and flowers. During the Individual Expert Phase, the future vision to research more lucrative vegetables in addition to rice was expressed, but a substantial change in direction was made during this phase. There is no documented material for determining whether this should be seen as a change in direction, and this view relies on nothing more than the evidence provided by the persons involved. Though it is actually difficult to make a judgment, it is conceivable that one of the major factors behind the shift was that the original intent of the earlier individual expert was purely an objective that had been made at a personal level, and had not necessarily been authorized. It is likely that this focus on rice was due to the fact that rice was the central field of Japan's international agricultural cooperation, and that the value of Ghana's rice imports was on the rise at that time.

(5) Shift in the control of management

The Japanese expert carried on the position of the Director General at the IDC, and basic project management was also conducted by the Japanese experts. Meanwhile, control was being handed over

from the Japanese to the Ghanaians. The view of the dispatched experts was that it was improper to have a Japanese expert presiding as Director General, and they strove to make a Ghanaian preside as Director General by the time they left office. Furthermore, Ghanaians were already being employed as section managers of the respective research divisions at the research center (soil, rice cultivation, horticulture, the environment, agricultural machinery, water management), and the IDC had already started developing its own human resources. Therefore, the experts strove to enforce an autonomous management, all the while aiming for the IDC's takeoff as an organization. Further still, during this phase, the experts gave much importance to developing a relationship with the Ghanaians that was on equal footing. Every Friday, after cleaning the research center together with their Ghanaian counterparts and other involved persons, they would hold a simple party and engage in communication. Meanwhile, there was no change to the fact that the project direction, basic management (including finances) and technical assistance were being led by Japanese.

2-3-3 Results

Activities were implemented during this phase based on the logic shown in Figure 2-5. The following summarizes their results:

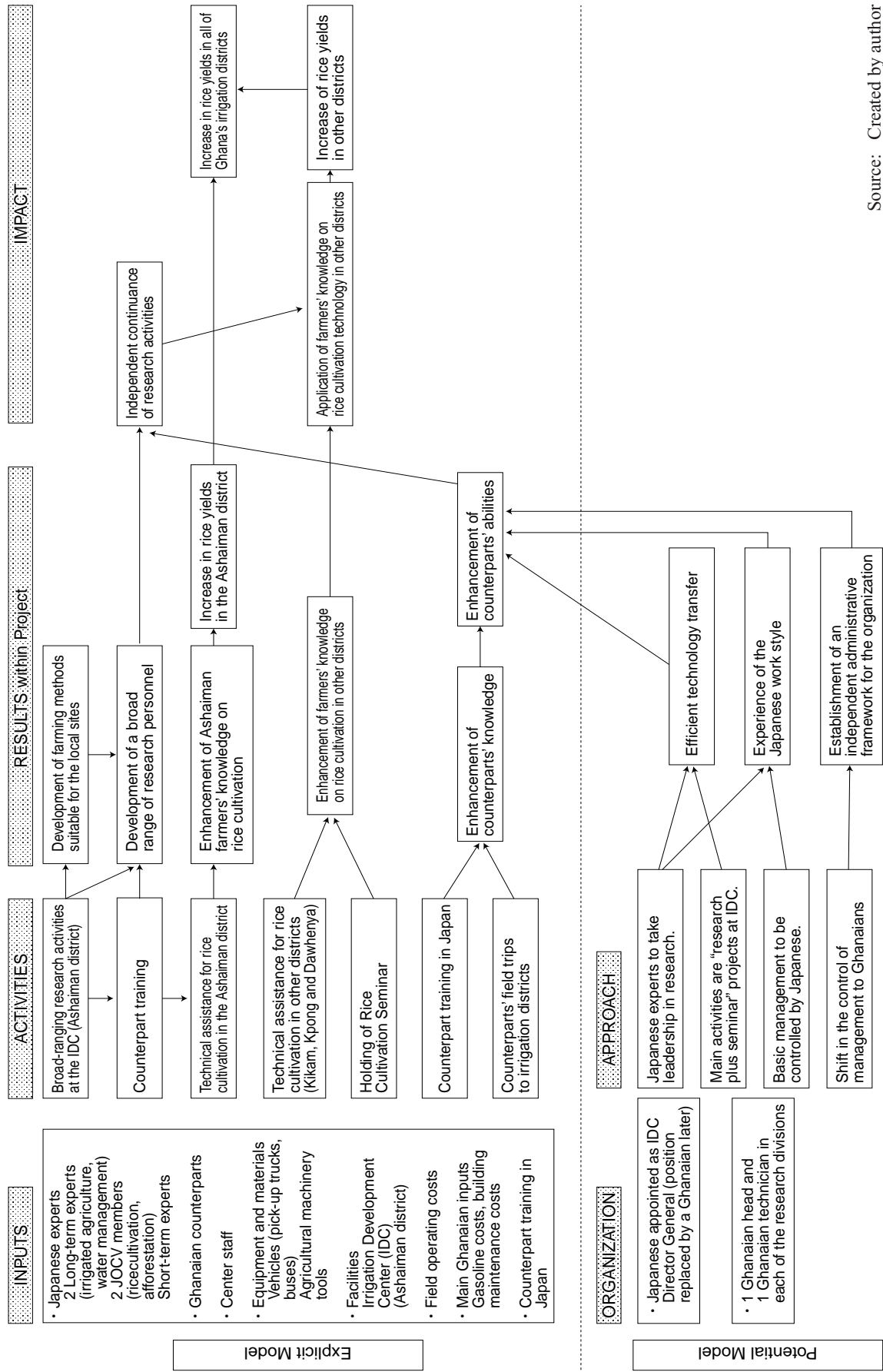
- The dismissal of middle-level officers due to pressure from the World Bank, and the associated impact
- Continuation of research activities at the IDC
- Development of research personnel
- Failure to achieve the target of increased production
- Shift to the model-type technical cooperation

(1) The dismissal of middle-level officers due to pressure from the World Bank, and the associated impact

The World Bank at the time was promoting structural adjustment policies, and in Ghana as well, cuts to the number of public servants and government subsidies were being strongly urged. GIDA became a target for such structural adjustment, and middle-level personnel were dismissed from GIDA in line with government policy which was on the advice of the World Bank. Not only personnel but subsidies for purchasing fertilizer were also cut. As a result, the organizational power of GIDA, which was the IDC's umbrella organization, was weakened, and this in turn led to direct and indirect negative impacts on the progress of the project. Direct effects included a delay in the technology transfer of the project due to the dismissal of relevant personnel, and indirect effects included the fact that the atmosphere of ongoing dismissals did not lend itself to an atmosphere in which technical cooperation could be implemented stably. Furthermore, due to the withdrawal of subsidies for the purchase of fertilizers, farmers' problems were not limited to just technological problems, but financial problems such as how they should go about purchasing seeds and fertilizers were aggravated. Their problems became beyond control of mere technical cooperation projects.

Figure 2-5 The Logic Model (Initial Intent)

Comprehensive Logic Model of IDC Project (1992-1995)



Source: Created by author

(2) Continuation of research activities at the IDC

Essentially, most research activities at the IDC were run with Japan's inputs, and in effect, the specific activities being implemented had a focus on rice cultivation. Therefore, even while being influenced by the World Bank's structural adjustments, the research activities continued mostly steadily. Furthermore, the role of Director General was transferred from the Japanese to a Ghanaian, and Japan took a more supporting position. It is considered that this fact facilitated in the autonomy of the organization, and while it was a small change, it was terribly meaningful. Actually, considering the fact that this structure was still utilized as the structure of the research organization in the ensuring technical cooperation projects, it would be fair to reason then that the IDC evolved as an ongoing organization, and that the objective of this project, which was the target of strengthening the foundation of the IDC, was virtually achieved during this period.

(3) Development of research personnel

Human resources were provided concentratedly in the Ashaiman district, where the IDC is located, and they include 2 experts (irrigated agriculture and water management), and 2 members from JOCV (rice cultivation and afforestation). While in effect the focus of research was on rice, it crossed 6 disciplines. So human resources were able to be developed in a broad range of fields. Counterparts were allowed to leave the research center and conduct practical research activities, such as actual investigative research, in other districts as well (including Kikam and Kpong). As a result, it can be said that relatively high-quality research personnel were able to be trained. A number of the research personnel, who were trained during that period, are now still serving as key personnel to support GIDA's research divisions. In this sense, it can be argued that this is a significant outcome. Meanwhile, the IDC did not seek ties with other research organizations because it expanded its disciplines and aimed to become an "all-in-one research organization" that encompassed all the fields. (This point is not confined to just the IDC, but is a phenomenon that can be seen throughout Ghana and in Japan's research institutes.)

(4) Failure to achieve the target of increased production

Intensive technical assistance was provided in the Ashaiman district, where the IDC is located. However, Ashaiman at that time was not fraught with only technology-related problems, but also problems involving the aging of irrigation facilities, and agricultural machinery (tractors). Therefore, the IDC's approach, which focused mainly on the research and training, was not successful in increasing rice production. In addition, direct technical guidance and rice cultivation seminars were also provided to farmers from other districts outside Ashaiman, where the IDC is located. As a result, it was believed that there was some effect in terms of their knowledge of rice cultivation technology, but the opinion of the farmers themselves is that the knowledge did not help much to increase rice production. According to interviews with the farmers, agricultural production did not actually increase until the subsequent technical cooperation phase, when irrigation facilities were improved and farmers

became truly organized. One reason that can be given is the fact that, since during this Mini Project Phase, “assistance” to farmers was in the form of technology, and the medium for delivering this assistance focused on training; this meant that there were no direct effects on facilities, equipment, materials or other hardware aspect. Apart from the problems of the hardware aspect such as facilities, equipment and machines, it is probable that there were in fact very few farmers who were actually able to utilize the technology they were taught at training due to regional differences, and the impact of the withdrawal of subsidies for purchasing fertilizers. Furthermore, it has not been confirmed that production was improved in other districts as a result of receiving training.

(5) Shift to the model-type technical cooperation

At the same time this project finished, a development survey started in anticipation of grant aid for the improvement of irrigation facilities. This resulted in the start of a project to improve facilities in the Ashaiman district, where the IDC is located. Reasons why Ashaiman was selected include the fact that it was close to the Ghanaian capital of Accra, and that there was good potential for soil and farmers. Another major reason that can be given is the fact that the IDC had already been established with aid from Japan, and was presently active, and a technological support base had already been developed. The fact of the matter is that, in the development survey and F/S report of the time, the Ashaiman district was a low priority in the economic analysis, but it was selected as a priority district for grant aid on the basis that the IDC was located, and that its intended effects of technical support were expected. Consequently, the Ashaiman district ended up assuming a new look as “Japan’s showroom for comprehensive technical support” where there was a convergence of “software-type of support” or technical assistance, and “hardware-type of support” through grant aid. This fact ended up having a significant effect on the direction of Japan’s subsequent aid in Ghana’s irrigation. In other words, it would be fair to say that the concentration of Japan’s aid in this area created a basis that would be linked to the policy of subsequent technical cooperation projects, and serve as a so-called “model” ideal for other development. As is mentioned again later, the “model farming system” became the goal of the ensuing technical cooperation project. However, this term “model” does not refer to something that can be transferred to any other district without modification, but rather we could probably identify it as a so-called “role model” that includes the full spectrum of ideal elements.

2-3-4 Analysis

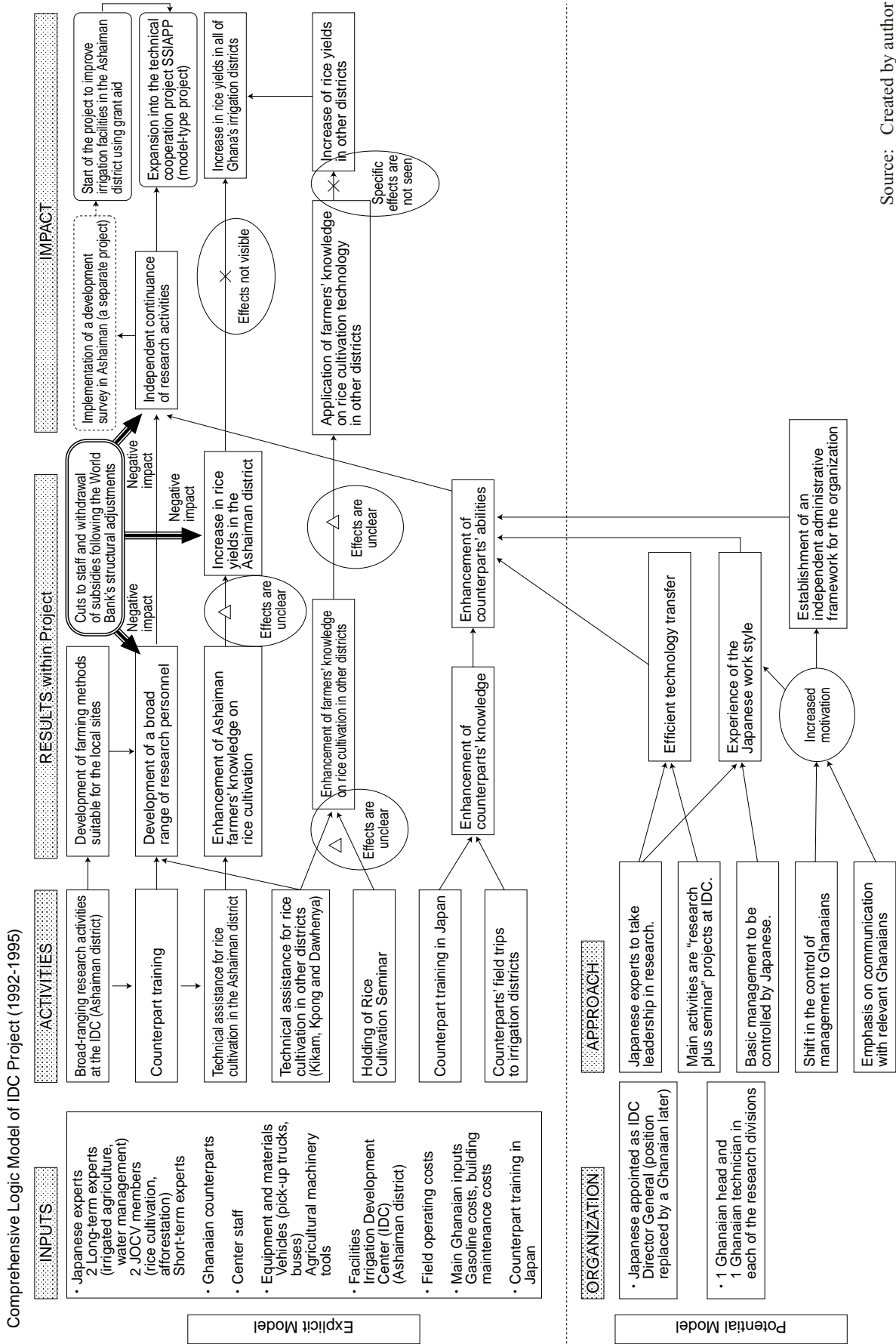
The following facts can be indicated from the relationship between the initial intent and the results in Figure 2-6:

The effectiveness and problems of the “core function development” project that focused on technology

The effectiveness and problems of transferring power to the counterparts

The effectiveness and problems of combining “software-type support” and “hardware-type support”

Figure 2-6 The Logic Model (Follow-up Study)



Source: Created by author

The impact of structural adjustment, and the policy limitations of technical cooperation via experts

(1) The effectiveness and problems of the “core function development” project that focused on technology

This project was to pursue research based on practical experiments at the research center, and to disseminate its results through seminars and training. This was a main approach formerly taken in JICA’s technical cooperation for a so-called “core function development project.” As for its effectiveness, the core function development project was beneficially effective because research combined with training in the one location maintained high-level research that was disseminated through training. Furthermore, research was not conducted in laboratories, but experiments were done in the field and farmers actually got involved. A thorough commitment to practicality reflects a typical Japanese quality. Research activities were conducted through the counterparts based on an OJT-type philosophy of nurturing research personnel through activities. The “core function development” project is advantageous in terms that the multiple objectives of “valuable research,” “dissemination to farmers,” and “development of the research organization and human resources” can be achieved through activities at the center. At the same time, the “core function development” project had limitations. One of the limitations was that it became difficult to manage due to the ambiguity of a key objective because the three multiple objectives were going to be achieved. If dissemination to farmers was the only objective, even more efficient training should have been implemented. But conversely, if training research personnel was the objective, the level of research should have been raised. If both objectives were to be targeted, a considerable degree of ingenuity would be required, and in the worst case scenario, there would be a risk to end up not achieving either objective. Another problem is that although support at the center is intended for “knowledge” and “technology,” the actual utilization of that knowledge comes down to the farmers. Especially in Africa, there is a natural limit to assistance for knowledge acquisition. Even if a farmer wants to make use of knowledge or technology, in most cases there is no social framework to achieve this, such as input goods or farmers’ organizations.

(2) The effectiveness and problems of transferring power to the counterparts

In earlier phases, the experts took leadership, and a Japanese assumed the role of Director General at the IDC. However, in this phase, a Ghanaian was appointed Director General, and a Japanese served as the Deputy Director General. In terms of the effects of this kind of delegation of authority, a sense of ownership was nurtured, and counterparts were able to be motivated toward the project. The transfer resulted in greater commitment. Furthermore, with authority being delegated to Ghanaians, they started to make more of their own judgments, and personnel were able to be trained for autonomous operation. Frederic Herzberg’s “motivation factors and hygiene factors” are often quoted in management theory. It is said that wages and salaries become sources of dissatisfaction as “hygiene factors,” whereas promotions, which are “motivation factors,” raise the enthusiasm of staff. Even from

this perspective, it is believed that the delegation of authority raised the morale of the relevant staff and was effective. Moreover, during this phase, communication-building based on an equal footing was carried out. On Fridays, after cleaning together, all the staff would eat a simple meal together and communicate with each other. In the interviews with the counterparts, there were some respondents who spoke with a smile that it was because of this practice that they were able to communicate. It appears building a balanced relationship played a part in raising the motivation of the staff. Turning to problems involved with the delegation of authority, discontent may build up conversely with a mere title transferred because one cannot make his or her decision autonomously. It is also difficult to make a decision when to delegate authority. The organizational framework of the IDC had been built by the Japanese experts, and the office of Director General was assigned to a Ghanaian at a stage when the IDC had already been stabilized as an organization. It can be pointed out that this led to a relatively smooth transition. It is highly likely that, if the preceding experts had not exercised leadership and had left things up to their Ghanaian counterparts, the establishment of the IDC would have been delayed.

(3) The effectiveness and problems of combining “software-type support” and “hardware-type of support”

As has been previously mentioned, there are limitations to combining only software aspects of research and training, so an approach that also includes “hardware aspects” is necessary. For this kind of issue, a development survey was started to improve the irrigation districts at the conclusion of the current phase. This resulted in the start of a project using grant aid to improve irrigation facilities in Ashaiman, where the IDC is located, and the Okyereko district. The provision of both “software-type” and “hardware-type” of support does result in a significant impact, but this kind of approach will be costly and create new types of problems. In other words, there is a difficulty in how this type of ideal model should be extended to other districts. At the time, there was absolutely no discussion on how the model should be expanded into other districts. Though we looked into the existing report on the development survey, we could only find that the decisive factor for selecting the Ashaiman district was the existence of the IDC in the district, and that the reason for selecting the Ashaiman district as a subsequent model district for SSIAPP was because a partnership was offered through grand aid. Besides, there was no discussion made as to how subsequent dissemination should be promoted. This problem was left untouched and carried over to the next phase, and ultimately it was held over until the subsequent Follow-up Phase.

(4) The impact of structural adjustment, and the policy limitations of technical cooperation via experts

The trend of structural adjustments attributable to the World Bank brought about reductions and losses of staff at GIDA, and it undermined the foundations of human resources at the counterparts to JICA’s technical cooperation. Even from a perspective of policy, the weakening of the involvement of government agencies in irrigated agriculture was causing movements against the direction of JICA’s