

2. T O R (関連資料)

SOCIALIST REPUBLIC VIETNAM  
MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

THE APPLICATION FORM FOR JAPAN'S GRNAT AID

Applicant:  
The Government of  
The Socialist Republic  
of Vietnam

Project title: Rural water supply project in  
Vietnam

Economic Sector:

Project type:

Water supply

1. Facilities Construction  
2. Equipment Supply

Total Project Cost: JPY 1,400,000,000 and Proponent's counterpart  
VND 58,080,000,000

Responsible Ministry:  
(Ministry requesting the Aid)

Implementing Agency  
(Agency in charge of execution  
of the Project)

Ministry of Agriculture  
and Rural development

Centre for Rural water supply  
and Environmental Sanitation

The Application Form for Japan's Grant Aid

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Centre for rural water supply and environmental  
sanitation (CRWSAES)

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I. Project Description

1. Background (Please describe in detail)

(1) Current situation of the Sector

The basic goal of the Government for the sectoral development is to provide the people with adequate water which is safe and easily accessible. The supply of adequate safe water is essential in promoting people's health and economic development. The big cities of the country are better situated in this respect. Water supply improvement in big cities has been given a high priority by the government and there are a number of projects with a view to upgrade the water quality to a safety level to improve the quality of life in these cities. However, the situation of the rural areas is completely different. For example, the people in many of the provinces in northern Vietnam are suffering from the lack of safe water and water itself.

They rely on the water from springs, small rivers, shallow wells and rain. The water from these sources contains a lot of harmful substance such as Fe, Mn and various pollutants, and harmful bacteria which cause many water borne diseases among the people who live on it. As a result, the people in these areas are unable to develop their local industries as expected and remain poor both in health and economy.

(2) Problems to be solved in the Sector

Many of the rural areas, especially in the northern region of the country people suffer from the lack of clean water due to the insufficient and unsanitary surface and spring water and the lack of facilities to obtain groundwater.

In order to improve the situation, the following measures should be taken:

- 1) To detect and secure reliable water sources
- 2) To dig deep wells which are capable of supplying enough water to the provinces.
- 3) To install concentrated water supply systems which are capable of pumping up and treating a large quantity of water efficiently.
- 4) To decrease water borne diseases such as diarrhea, colitis, cholera, etc. by installing efficient water treatment plants.

(3) Necessity and Importance of Improvement in the Sector which lead to the formulation of the Project

- 1) As mentioned earlier, many rural areas of Vietnam suffer from the lack of safe water. According to statistics, at present, only about 30% of the rural population have access to safe water for domestic use. It is estimated that approximately 40 million people are suffering from the lack of good quality water in whole Vietnam. Area-wise, about half of the 53 provinces suffer from the bad quality water, including the 5 northern provinces of Ha Noi, Bac Thai, Ninh Bin, Thanh Hoa and Ha Tinh. UNICEF has provided support for the Rural Water Supply Project in Vietnam since 1982, but its activity is limited to certain areas and will not reach the projected areas in these five provinces, where good quality water is obtainable only from deep wells. Both locally available equipment and UNICEF equipment are mainly manual types and it is impossible for them to dig a well deep enough to get safe and abundant water. If efficient equipment and machinery are provided with necessary technology, the people in the said areas will be supplied abundant clean water and their living conditions will be greatly improved. As seen above, the project is not only necessary and important to keep the people in the area good in health but to alleviate poverty and generate economic activities in the areas.
- 2) The annual per capita income in the projected areas is less than US\$100 at present, but the people there are unable to raise the productivity of their industries and their living standards due to the lack of basic rural infrastructure including safe water supply and other factors. The fundamental problem of Vietnam's rural structure is its low productivity and the consequent prevalence of hidden under-employment. Based on the 5th Resolution of the Central Committee of the Party, the State Planning Committee set up a National Program for Rural Economic Structural Transformation focusing on:
  - a) renewing the economic structure of agriculture, forestry and fisheries,
  - b) renovating the rural economic structure through industrialization and modernization, and
  - c) building and upgrading rural infrastructure.

MARD is planning to support this National Program through the implementation of various projects.

The proposing "Rural Water Supply Project" is one of them. The supply of abundant safe water will help the provinces to create an environment in which rural dwellers can generate their own employment opportunities and develop their rural industries, which will greatly contribute to the improvement of rural economy.

(4) Relations between the Sector and the Project

Constant provision of clean water requires great efforts of central, provincial and local offices concerned. This project is to help the provincial governments and MARD branches to set up their effective water supply systems and operate and maintain them efficiently.

For this purpose necessary equipment and machinery will be provided to the relevant provinces through the Centre for Rural water supply and environmental sanitation, Ministry of Agriculture and Rural development (MARD).

The selected five provinces will dig 5 to 21 boreholes respectively with the depth of 100 to 200 meters during the project period. Thus the people in the areas will obtain enough clean, water. Upon necessity, the Provincial Rural Water Supply Projects of the respective provinces will make more wells by themselves with the use of the provided equipment and acquired digging techniques.

The success of this project will be useful in solving the problem of clean water shortage in other areas of the country.

- (5) Reasons why Japan's Grant Aid is requested for this particular Project Japan is noted for advanced technology and superior equipment for deep well drilling and water supply systems. Moreover, we know that Japan has been extending assistance to the countries all over the world under the "Program for Basic Human Needs" which includes ground water development. In this sense the Vietnam government considers it proper to ask the Japanese Government to extend its grant aid for this water development project.

2. Objectives and Outline of the Project

(1) Objectives of the Project

(i) Short-term Objectives

To provide enough and safe water to the people in the projected areas of five northern provinces; Ha Noi, Bac Thai, Ninh Binh, Thanh Hoa and Ha Tinh.

(ii) Medium and Long-term Objectives

To expand the water supply areas to other parts of the said five provinces and step by step provide abundant quantity of safe water to the rural population living in other 48 provinces of the country.

- (iii) Please fully describe the relations between the project and objectives, and how the project will contribute to the accomplishment of the objectives.

The objectives mentioned above will be accomplished by the installation of enough number of concentrated water supply systems connected with deep wells in target areas.

This project consisting of procurement of equipment and machinery for deep wells drilling and construction of concentrated water supply systems will directly contribute to the materialization of the objectives.

- (2) Outline of the Project (Please give a full description of each facility and equipment and their detailed specifications)

The assistance of the Japanese Government is needed to supply the equipment as listed in ANNEX-I to complete the proposed wells and concentrated water supply systems.

A brief summary of the Project will be as follows:

- (i) Construction of wells and water supply systems  
The Provincial Rural Water Supply Projects of Northern five provinces will construct deep wells and centralized water supply systems in their respective projected areas in order to provide their population with safe water.
- (ii) Stages of the Project  
The Project will be executed by 3 stages (in 3 years). Stage I will be executed with the assistance of Japanese engineers to be engaged in the installation of the equipment under Japan's grant aid.  
Stages II and III will be executed by the Vietnamese engineers and technicians by using the equipment and materials to be provided by Japan at Stage I.
- (iii) The size of the wells  
The size of the wells to be constructed will be 5" - 12" in diameter and 100 - 200 meters in depth.
- (iv) The number of wells  
The number of wells to be dug in each stage is shown in the following table.

Work	Stage	Stage I	Stage II	Stage III
Wells to be dug by the Japanese aid		20		
Wells to be dug by the Provinces using equipment & materials supplied by Japan		0	24	24
Total		20	24	24

The total number of wells throughout the project period will be about 68.

- (3) Location Plan of each Facility and/or Equipment

Please refer to ANNEX III.

- (4) Cost Estimates (Please describe in detail all the premises on which the cost estimates are based such as basic unit prices, inflation rate, foreign exchange rate, and so on. Please attach detailed tables of estimated costs of each facility and item of equipment. If estimated in local currency, please mention the latest exchange rate of the currency to the U.S. Dollar or the Japanese Yen.)

## I. Project Cost

### (1) Foreign Assistance

#### (i) Equipment

A. Well Drilling Rigs with Accessories	¥716,000,000
B. Well Materials including Casings & Screens	¥49,000,000
C. Pumping Equipment	¥78,000,000
D. Supporting Equipment including Vehicles, Testing Equipment, Underground Water TV System, etc.	¥228,500,000
E. Equipment for Water treatment Facilities	¥328,500,000
Total:	¥1,400,000,000

The above price includes the services such as transportation, commissioning, training at site etc.

### (2) Proponent's Counterpart

(i) Procurement of the land for water supply systems	7,480,000,000
(ii) The cost for foundation work, piping and local consultancy fee	30,600,000,000
(iii) Water supply pumps with pressure tanks (78 units)	20,000,000,000
Total:	VND 58,080,000,000 ( 1 USS - VND 11,000 )

## 3. Benefit, Effect and Publicity of the Project

### (1) Population that will benefit directly from the project

The total of about 450,000 people in the projected areas of the five proposed provinces will directly benefit from the Project.

### (2) Population that will benefit indirectly from the project

People in the other areas of the five provinces (about 6.5 million people) will benefit indirectly from the Project.

At the close of the three year project period, the equipment and machinery used for the Project excepting those kept at the project site for maintenance will be utilized at other locations to supply safe water to their rural people.

If we include the above people, the total number of the people who benefit indirectly from the

Project will exceed 10 million.

- (3) Area that will benefit from the project

About 218 KM<sup>2</sup>

- (4) Economic and Social Effects of the Project (Please describe in detail)

- (i) Current situation

The rural areas represented by the projected areas of the five proposed provinces suffer from the lack of clean water. As a result they rely on the filthy water from the rivers, ponds or springs, which causes various water borne diseases and other unfavorable health problems. Moreover, many people escape from the rural areas to big cities where they can get water easily, and this causes economic recession in the rural areas and over population in big cities.

- (ii) Expected Effect of the Project

The project will supply adequate quantity of clean water to the projected rural areas and the people there are able to enjoy healthier social lives. This makes the people there to settle themselves in the rural community instead of moving to big cities, and eventually it may contribute to the economic development of the areas and provinces as well.

It is expected that rural industries like (1) food and agro-processing industries and (2) small-scale and household enterprises are to be promoted and developed in the projected areas in the future if the rural people will remain in the community. It is taken for granted that the supply of enough safe water to rural areas is the basis for sound community life and the development of rural industries.

- (5) Publicity (How many people are expected to, notice the benefit or positive effect of the project implemented with Japan's grant aid when it is completed ?)

About 212,000 people in the projected areas will enjoy the benefit of the project immediately after its completion and more than 6 million people in the projected provinces will notice the positive effect of the Project in a few years.

#### 4. Request to Other Donors

- (1) Is there any request made to other donors for assistance closely related to this project ?

1. Yes

2. No

- (2) If yes, please fill in below:

- (i) Name of the donors;

UNICEF

- (ii) Title and outline of the assistance;

- A. Title  
The Rural Water Supply project in Vietnam
- B. Outline of the assistance  
Provision of safe water to the rural areas of Vietnam

(iii) Possibilities that the donor will extend the assistance requested;

UNICEF started its assistance in 1982 in 3 provinces. In 1993 the project was expanded to 53 provinces, but its effect is not as desired by the people due to its limited budget and scope. According to UNICEF's own evaluation report, it has succeeded in providing safe water to only 30% of the rural population in 12 years.

It is understood by the offices concerned that UNICEF assistance alone cannot attain the goal set by the Government to provide safe water to the 80% of the rural population in the country by the year 2000.

The assistance requested from the Japanese Government will not duplicate UNICEF assistance because of the following reasons:

- A. The wells UNICEF digs are smaller in scale than the ones now sought by the Project. The Project has to get fresh water at a depth of 100 to 200m, but the existing drilling equipment supplied by UNICEF is unable to reach that depth.
- B. In order to obtain UNICEF support, there must be financial contribution of the users to water supply systems, but the people in the projected rural areas are too poor to make such contribution, and hence they are unable to accept UNICEF support.
- C. In the projected areas of this Project there are no water sources installed with UNICEF support.

(iv) In the case where other donors do not extend assistance, please describe in detail appropriateness and effectiveness of this project:

A. As explained in 4 (2) (iii) above, the water sources (wells) UNICEF makes are different from the ones this Project plans. It is considered essential to make deep wells in the projected areas in order to supply abundant safe water to the rural people in view of the geological conditions and water quality in the area under the Japanese Government Grant.

B. The people in the projected areas are too poor to ask for UNICEF support. Therefore, the water supply to be made available by the Japanese Grant will be the only source for safe and abundant water for the people there.

(v) In the case where other donors extend loans, please describe the reason why Japan's Grant Aid is requested for the project.

Not applicable



5. Priority

(Please describe priority of this project among other projects for which requests are made to Japan)

As the Project concerns the improvement of the health and living conditions of the people, it has a high priority.

(Please attach project List with priorities)

Please see ANNEX-IX

6. Ministry and Agency in charge of the Project

(1) Outline of Implementing Agency (Please describe in detail)  
(the Agency in charge of the execution of the Project)

The Agency in charge of the Project is the Centre for Rural water supply and environmental sanitation. Ministry of Agriculture and Rural development (MARD), but the Agencies in charge of the operation of the Project are the respective Provincial Rural Water Supply Projects (PRWSP).

(i) Organization Chart of the Agency (in general)

(Please mark the responsible department and division in charge of the project)

Please refer to ANNEX-II

(Please attach detailed organization chart pointing out the responsible department, division and sections in charge of this project)

(ii) Authorities and Duties of the PRWSP

A. Authorities

To organize, implement and monitor the rural water supply in the provinces with the investment of the Government (Central and grassroots levels), assistance from foreign governments or international organizations and the contribution of the individual and organizations.

B. Duties

1. To receive and manage the budget and materials/equipment
2. To implement the construction of various water sources, following the required standards of materials and techniques
3. To inspect the quality of water and the specifications of the water supply systems before handing them over to the users

4. To organize the maintenance network of water supply systems, and
5. To train the users in the operation and maintenance of the water supply systems.

(iii) Personnel (Please mention the number of staff, workers, and employees of the agency and the responsible department, division and section in charge of the Project)

A. The Provincial Rural Water Supply Project has the following Sections:

- General Administration Section
- Finance Section
- Planning and Material Section
- Technical Section
- Drilling and Maintenance Team

B. Personnel of the respective Provincial Rural Water Supply Projects are shown in the following table:

No.	Province	Manager				Driller and Technician	No. of Drilling teams
		Total	University diploma	Intermediate level	Primary level		
1	Ha Noi	13	7	2	4	60	4
2	Ninh Binh	14	7	4	3	30	3
3	Thanh Hoa	25	8	9	8	42	7
4	Bac Thai	6	4	2	-	14	2
5	Ha Tinh	11	4	3	4	30	3

(iv) Budget (Revenue and Expenditure)

(If mentioned in local currency, please mention the latest foreign exchange rate of the currency to the U.S. Dollar or the Japanese Yen)

Budget of PRWSP

(VND '000,000)

Province	1994				1995			
	Personnel service	Current operating expenses	Others	Total	Personnel service	Current operating expenses	Others	Total
Ha Noi	1054.6	2827.6	218	4100.2	1479	2571.1	304.9	4355
Bac Thai	92	510	62	664	105	620	67	792
Ninh Binh	224	1050	127	1401	240	1100	134	1474
Thanh Hoa	562.8	1688.4	255.1	2476.3	680.4	2041.2	272.2	2994.2
Ha Tinh	210	720	120	1050	250	1000	200	1450

Exchange rate : US\$1 = VND11.000

(2) Outline of Supervising Ministry (Please describe in detail)

The Supervising Ministry is the Ministry of Agriculture and Rural development.

The department in charge of the Project is the Centre for Rural water supply and environmental sanitation.

(i) Organization Chart of the Ministry (in general)

(Please mark the responsible department and division in charge of the project and implementing agency)

Please refer to ANNEX VII

(Please attach detailed organization chart pointing out the responsible department, division and sections in charge of the project and implementing agency)

(ii) Authorities and Duties of the Ministry

While there are numerous authorities and duties of the Ministry, the following are those of the Centre for Rural water supply and environmental sanitation.

1. Summarizing situation domestic water and rural environmental in order to help the Ministry of Agriculture and rural development make medium, long-term and yearly plans to submit to the Ministry of Agriculture and rural development and organizing to have those plans implemented after approved.

2. Making up the plans of estimate, distribution, guidance and control the-use of Capital sources (including the aid from the International Organizations' projects and an amount of money as the capital from the Vietnam Government) for the nationwide construction works of domestic water and rural environmental sanitation.

3. Guiding to make up projects and co-ordinating with the interrelated offices and branches in examining and approving the project to submit to the Ministry to be approved as well as conducting to carry out the projects for domestic water and rural environmental sanitation that were approved.

4. Intersperse the programs for domestic water of UNICEF and the International all other ones with the economic - social programs relating to the rural.

5. Being allowed to have relations with the UNICEF and the International other organizations and the interrelated in and out the country organizations to make up projects that wan the assistance and aid from the international organizations for domestic water supply and rural environmental sanitation in accordance with the ministry's authorization.

6. Organizing investigation and applying the technology and science progress as well as Building up the domestic water supply and rural environmental sanitation models.

7. Organizing the intensive training course in technology and profession for cadres, workers and peasants on domestic water and rural environmental sanitation as

assigned by the Ministry.

Propagandizing people to use clean water and preserve environmental sanitation.

8. Participating in building policies and structures of the management centre fields.

9. Organizing the materials supply, technical equipment services along with the technological transfer services on domestic water and rural environmental sanitation.

10. Managing the structures, labor and property handed to the Centre by the ministry according to the Government stipulations.

(ii) Personnel (Please mention the number of staff, workers, and employees of the Ministry and the responsible department, division and section)

- The investment and plan office
- The Technological and capital construction
- The Environment and Communication office
- The Compound administration office

The task, the function and staff of each office will be approved by the Director.

- The branches of the Centre
- + The materials and technological transfer station of domestic water and rural environmental sanitation.
- + The non - financing by the State operation station

In charge of the North: 30 (univ. graduates and post-graduates)

In charge of the South: 4 (1 graduate, 1 intermediate)

(iv) Budget (Revenue and Expenditure)

(If mentioned in local currency, please state the latest foreign exchange rate of the currency to the U.S. Dollar or the Japanese Yen)

Budget for Technical Section (VND '000,000)

Items	Year	1994	1995
	Personnel services		182.4
Current operating expenses		638.4	798
Others		91.2	114
Total		912	1140

1US\$ = VND11,000

7. Preparation

(1) Project Site (Please attach photographs and maps of the site with the various scales including that of 10,000:1)

(i) (a) Address of the Site (Provinces and their districts)

Ha Noi : Tu Liem  
Bac Thai : Dong Hi, Pho Yen, Thai Nguyen  
Ninh Binh : Hoa Lu, Tam Diep, Gia Vien  
Thanh Hoa : Trieu Yen, Nong Cong, Vinh Loc  
Ha Tinh : Duc Tho

(b) Total Area of the Site

Ha Noi : 8 km<sup>2</sup>  
Bac Thai : 60 km<sup>2</sup>  
Ninh Binh : 45 km<sup>2</sup>  
Thanh Hoa : 55 km<sup>2</sup>  
Ha Tinh : 50 km<sup>2</sup>

(ii) Land Preparation

(a) To which extent has the land been expropriated for the project ?

The land for the well drilling and central water supply systems has been expropriated for the Project in the proposed five provinces.

(Please attach the laws and procedures concerning the expropriation of land)

The permission of land-use for the implementation of water supply constructions will be issued by local Authorities (Provincial Authorities) after the designs are ratified by Ministry of Agriculture and Rural development (MARD).

(2) Electricity, Water Supply, Telephone, Drainage and Other Facilities

(Please describe the extent to which above mentioned incidental facilities have been prepared)

The following facilities are available at each site of the projected areas :

- National electricity network
- Fax and telephone system
- Advantageous traffic system

(3) Is there any information, statistics and data regarding geographical, geologic meteorological, oceanographical situations, etc ?

(If any, please attached those information)

Data and information on the geographical, geological/hydrogeological and meteorological situations are available.

## 8. Capabilities of the Implementing Agency

(Please describe the capabilities of the agency to manage, sustain, and operate the project)

### (1) Current Situation

The Provincial Rural Water Supply Projects have neat organizations with the staff of technical and management capacity and workers experienced in water sources equipment installation. Therefore, they are able to manage, operate and sustain the Project without difficulty when the water supply systems are completed under Japanese grant aid.

However, due to financial difficulties and lack of equipment they are unable to solve the problems related to their inability to supply safe water to the people.

### (2) Problems of the Agency

While there is an urgent request for safe drinking water from the residents, the Provincial Rural Water Supply Projects are unable to comply with the request due to the lack of investment funds and equipment needed for the construction of deep wells and water supply systems.

### (3) Improvement Plan (If any, please describe in detail the contents of such a plan that will enable the Agency to handle the project more effectively and efficiently)

The projected areas of the proposed provinces are difficult areas where neither the existing equipment of the provinces/MARD nor UNICEF equipment is unable to operate.

The most effective way to solve the problem is for the provinces to make the best use of the equipment to be provided under the scheme of Japan's grant aid.

The Provincial Rural Water Supply Projects staff have enough capability and experience to install the concentrated water sources if the Japanese Government provides equipment and initial guidance to implement the Project.

## 9. Operation and Management of the Project

### (1) Personnel

The number of personnel will be increased when the Project is implemented as seen in the following table.

Personnel	Present		When the project is completed	
	Manager	Worker	Manager	Worker
Offices				
Supervising Ministry (Implementing Agency)	19	-	20	-
Operating Agency				
Ha Noi	13	60	14	70
Bac Thai	6	14	10	30
Ninh Binh	14	30	15	35
Thanh Hoa	25	42	25	42
Ha Tinh	11	30	12	35
Directory responsible personnel	69	176	76	212

(2) Budget

Management and operation budget for the Project.

	3 years ago	2 years ago	1 years ago	When the project is completed
Supervising Ministry (Implementing Agency)	330	650	760	1,300
Operating Agency				
Ha Noi	1,012.2	2,115.2	2,700	4,050
Bac Thai	-	-	332	1,150
Ninh Binh	648	778	167.5	1,750
Thanh Hoa	1,300	1,600	2,400	3,600
Ha Tinh	420	550	900	1,500

(In the case where additional budgetary allocation is needed for the implementation of the project, please answer the following question.)

(i) Has the additional budget been already allocated ?

1. Yes

2. No

(ii) If no, how and when will the additional budget be allocated ?

(3) Technical Abilities of Local Staff

(i) Please describe technical abilities of local staff operating the project.

The Provincial Rural Water Supply Projects staff have enough technical ability and experience to install water sources with the use of specialized equipment and maintain them.

- (ii) Please describe in detail educational background of those who are in charge of the operation and management of the facilities and equipment.

Most of the managers of the Provincial Rural Water Supply Projects are university graduates specializing in engineering, while the majority of workers are the graduates of technical high schools.

#### 10. List of Related Projects

(Please fill in below if there is a project executed by another donor country or international organization in related areas.)

- (1) Name of donor                      No project in related areas
- (2) Project Title
- (3) Project Outline
- (4) Type of Assistance  
(grant, loan, technical assistance, etc.)
- (5) Project Period
- (6) Relations with this Project

(If there are many project, please attach a list of those projects explained in the same way)

#### 11. Technical Assistance

- (1) Has technical assistance been extended to this project ?  
(i) Yes                                      (ii) No
- (2) Is technical assistance needed for the implementation of this project ?  
(i) Yes                                      (ii) No
- (3) If no, please describe the reasons why technical assistance is not needed.

MARD and the Provincial Rural Water Supply Projects have enough capability and experience for ground water development, and they can implement the Project without trouble under the mechanical training service of the Japanese supplier.

- (4) If yes, please fill in below.
- (i) Short-term experts              (    persons)    (sector:        )
- (ii) Long-term experts              (    persons)    (sector:        )



- (iii) Acceptance of trainees ( persons) (course: )
- (iv) Project-type Technical Cooperation  
(If needed, please describe the proposed project outline.)
- (v) Japan Overseas Cooperation Volunteers  
(If needed, please describe the proposed sector and related information.)
- (vi) Development Survey Programme (Feasibility Studies: and Master Plan)  
(If needed, please describe the outline of the proposed development survey programme.)

(5) Has an official request for technical assistance been already made ?

(i) Yes

(ii) No

(iii) If yes, please mention the date of the request.

(iv) If no, please describe the reason why the official request has not yet been made.

Not applicable

(v) When will the request be made to the Embassy of Japan ?

Not applicable

## II. General Development Plan

1. Title of the Plan (Please attach the whole volume of the latest general development plan.)

"Economic Development Plan up to 2000"

2. Economic and Social Situation

(Please mention the basic statistics of economic fundamentals.)

(1) GNP

US\$263 per capita (1993)

(2) National Income, Sector by Sector

· Share of national income by sector

Agriculture, Forestry :	36.48%
Industry :	20.45%
Services :	43.06%

(3) Unemployment Rate

5% (1991)

(4) Inflation Rate

5.2% (1993)

(5) Growth Rate

7.5% (1993)

(6) Balance of International Payments

Exports US\$3,000 million

Imports US\$3,100 million

Deficit US\$100 million

(7) Labor Population (as a whole, and sector by sector)

40,000,000 people as a whole

(8) Debt Service Ratio

(9) Outstanding Debts

· To western countries US\$4.5 billion

· To former Soviet Union Ruble 10 billion

(10) Major Items of Exports and Imports and their value

· Major export items:

Crude oil, coal & ores, agricultural & fisheries products, handicrafts, rice, etc.

· Major import items:

Petroleum products, machinery, fertilizer, etc.

(11) Major Trading Partner

· Export

Singapore, Japan, Hong Kong, Thailand and France

· Import

Singapore, Hong Kong, Japan, Korea and France

(12) Population and its Growth Rate

· Population 71,120,000 (1993)

· Growth rate 2.2% (1993)

(13) Average Life Expectancy (Male and Female)

62.5 years

(14) Death Rate and Birth Rate

- Death Rate
- Birth Rate      31.3/1,000

(15) Medical Structure

- Number of hospitals      1,883 (1993)
- Number of hospital beds    194,700 (1993)
- Number of medical doctors    28,500 (1993)
- Number of nurses      53,700 (1993)
- Number of midwives      12,000 (1993)

(16) Ten Diseases most Afflicting the nation

Trachoma, goiter, intestinal venereal, cholera, typhoid and parasitical diseases

(17) Illiteracy Rate (or Literacy Rate)

Illiteracy Rate      12% (1989)

(18) Other data

3. Outline of the Plan

(1) Most Important Sectors in the Plan

The most important sectors in the plan include the development of economy, the improvement of the people's living standards and the settlement of social problems.

(2) Basic Objectives of the Plan

- To transform the economic mechanism
- To promote the nation's economic development
- To raise social productivity and people's living standards

(3) How will the above-mentioned objectives be achieved ?

The objectives will be achieved according to the respective development plans.

4. When will the plan be executed and completed ?

The Plan will be carried out according to the Socio-Economic Development Policy of the "1992 to 2000 Economic Development Plan".

5. Relations between this project and the general development plan.

(Please describe the significance of the project in the general plan.)

As stated in 3.(1) and (2) above, one of the most important objectives of the National Development Plan is the raise of social productivity and improvement of people's living standard, which includes health, economic stability, living environment, etc.

This Project which aims at developing water sources and supplying safe water to rural people whose living conditions are underprivileged as compared with city people will immensely contribute to the realization of the said objectives.

6. Is there any assistance that other donors have extended/will extend to the projects and/or programme listed in the general plan ?

(i) Yes

(ii) No

(iii) If yes, please give basic information on the assistance

(a) Name of donor

(b) Prospect Title

(c) Project Cost

(d) Type of Assistance (Grant, Loan, Technical Assistance, etc.)

(e) Project Outline

## LIST OF EQUIPMENT

<u>Item</u>	<u>Description</u>	<u>Q'ty</u>
1.	Truck-mounted Mud Rotary Drilling Rig, complete with accessories, drilling tools, casing tools, fishing tools.  (One set each for Ninh Binh, Thanh Hoa and Ha Tinh province.)	3 units
2.	Truck-mounted Rotary Drilling Rig, capable of mud and DTH drilling, complete with accessories, drilling tools, casing tools, fishing tools and high pressure compressor for DTH drilling.  (One set for Bac Thai province.)	1 unit
3.	Truck-mounted Cable Tool Percussion Type Drilling Rig, complete with accessories, drilling tools, casing tools, fishing tools.  (One set for Hanoi province.)	1 unit
4.	Miscellaneous equipment such as Oxygene-acetylene welding and cutting equipment, DC and welder, Generator, Compressor for well development, Hand tools kit etc.  (One set each for five (5) province.)	5 sets
5.	Well Material	
5-1	Permanent casing	
5-1-1	Casing, 7" dia., 6.0 m long, carbon steel, JIS G-3444 or equivalent, 6 pcs. (36 m) each per well or 4 pcs. (24 m) per well.  (60 pcs. (360 m) for Ninh Binh province. 72 pcs. (432 m) for Thanh Hoa province. 52 pcs. (208 m) for Bac Thai province.)	184 pcs.
5-1-2	Casing, 12" dia., 5.5 m long, carbon steel, JIS G-3452 or equivalent, 10 pcs. (55 m) per well.  (50 pcs. (275 m) for Hanoi province.)	50 pcs.
5-1-3	Casing, 5" dia., 5.5 m long, carbon steel, JIS G-3452 or equivalent, 13 pcs. (71.5 m) per well.	364 pcs.

TABLE 1

## COMMUNES AND POPULATION IN THE PROJECTED PROVINCES

PROVINCE (Total population)	DISTRICT (population)	COMMUNE	POPULATION	POPULATION TO BENEFIT FROM THE PROJECT
HANOI (2,154,900)	Tu liem (54,148)	Phu dien	9.300	9,300
		Minh khai	10.603	6,000
		Cau dien town	12.277	12,277
		Xuan phuong	9.352	8,200
		Tay tuu	12.616	10,000
			54.148	45,777
NINH BINH (839,900)	Tam diep town (44,560)	Trung son	6.200	4,617
		Quang soi	7.300	5,427
		Nam son	8.400	6,480
	Hoa lu (113,453)	Ninh hai	6.100	5,220
		Ninh khoong	6.500	5,380
		Ninh my	8.200	5,900
	Gia vien (114,261)	Me town	12.000	8,500
		Gia phuong	8.400	5,800
			63.100	47,324
	THANH HOA (3,311,900)	Nong cong (170,237)	Nong cong town	4.276
6 communes			22.161	10,800
Thieu yen (245,833)		Thieu yen town	5.712	2,150
		8 communes	52.710	13,600
Vinh loc		Vinh loc town	3.900	2,000
		4 communes	24.030	7,200
		112.789	37,750	

PROVINCE (Total population)	DISTRICT (population)	COMMUNE	POPULATION	POPULATION TO BENEFIT FROM THE PROJECT
HA TOMJ (1,293,600)	Duc tho (155,804)	Duc tho town	9.500	3,903
		Duc yen	5.848	4,500
		Tung anh	7.063	5,400
		Duc trung	3.396	2,100
		Thai yen	6.663	3,900
		Duc xa	4.313	3,000
		Duc long	5.264	4,110
		Duc thuy	3.915	3,243
		Duc tinh	4.188	3,694
		Yen ho	5.254	4,118
		Duc luong	5.919	2,524
				61.323
BAC THAI (144,500)	Dong hy (116,192)	Don bam		
		Hoa trung		
		Song cau	116.192	16,000
		Linh son Hoa thuong		
	Pho yen (13,600)	Nam tien	6.200	5,500
		Dong cao	7.400	6,500
Thai nguyen City (28,848)		Phuc xuan		
		Phuc trieu	28.848	12,000
		Thinh duc		
<b>TOTAL</b>	<b>1,103,022</b>		<b>450.000</b>	<b>211,343</b>

Population is based on 1996 statistics

OUTLINE OF PROVINCIAL RURAL WATER SUPPLY PROJECT

PROVINCE	PROJECTED DISTRICT	SERVED POPULATION	NO. OF DEEP WELLS (Depth 100 - 200m)	DESIGNED WATER VOLUME PER WELL/DAY	DESIGNED WATER VOLUME FOR PROVINCES	MAJOR EQUIPMENT
Ha Noi	Tu. Liem (1 town and 4 communes)	46,000	5	600m <sup>3</sup>	3,000m <sup>3</sup> /day	Drilling rig (cable tool percussion) Pumping equipment, Well materials, Water treatment equipment, Auto feed pump system
Bac Thai	Dong Hi Pho Yen (2 communes) Thai Hguen city suburb	40,000	13	200m <sup>3</sup>	2,600m <sup>3</sup> /day	Drilling rig (DTI/Mud Rotary drilling) - ditto -
Ninh Binh	Hoa Lu (3 communes) Tem Diep town (3 communes) Gia Vien (2 communes)	47,000	16	200m <sup>3</sup>	3,200m <sup>3</sup> /day	Drilling rig (Mud Rotary drilling) - ditto -
Thanh Hoa	Vinh Loc (1 town & 4 communes) Trieu Yen (1 town & 8 communes) Nong Cong (1 town & 6 communes)	38,000	21	200m <sup>3</sup>	4,200m <sup>3</sup> /day	Drilling rig (Mud Rotary drilling) - ditto -
Ha Tinh	Du Tho (1 town & 10 communes)	41,000	13	200m <sup>3</sup>	2,600m <sup>3</sup> /day	Drilling rig (Mud Rotary drilling) - ditto -
Total		212,000	68		15,600m <sup>3</sup> /day	

- Remarks:
1. Estimated water consumption per capita per day is 50 liters.
  2. Water is to be served for 12 hrs a day.
  3. A well is to be pumped for 24 hrs a day.



3. S/W (英文)

SCOPE OF WORK  
FOR  
THE STUDY  
ON  
GROUNDWATER DEVELOPMENT  
IN  
THE RURAL PROVINCES OF NORTHERN PART  
IN  
THE SOCIALIST REPUBLIC OF VIETNAM

AGREED UPON BETWEEN

THE MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

AND

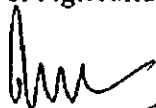
THE JAPAN INTERNATIONAL COOPERATION AGENCY

Hanoi, January 23, 1998



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Dr. Nguyen Ich CHUONG  
Deputy Director  
Department of International Cooperation,  
Ministry of Agriculture and Rural Development



---

Mr. Nguyen Trong TIN  
Deputy General Director of Infrastructure Department,  
Ministry of Planning and Investment



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Dr. Yuji MARUO  
Leader of the Preparatory Study Team  
Japan International Cooperation  
Agency (JICA)

## I. INTRODUCTION

In response to the official request of the Government of the Socialist Republic of Viet Nam (hereinafter referred to as "the Government of Viet Nam"), the Government of Japan decided to conduct a Study on Groundwater Development in the Rural Provinces of Northern Part in the Socialist Republic of Viet Nam (hereinafter referred to as "the Study") in accordance with the relevant laws and regulations in force in Japan.

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programs of the Government of Japan, will undertake the Study in close cooperation with the authorities concerned of the Government of Viet Nam.

The present document sets forth the Scope of Work for the Study.

## II. OBJECTIVES OF THE STUDY

The objectives of the Study are:

- (1) to evaluate potential of groundwater resources in the Study area
- (2) to formulate a groundwater development plan and a long-term water supply plan for twenty (20) communes in the five (5) provinces
- (3) to conduct a feasibility study for selected priority projects
- (4) to pursue technology transfer to counterpart personnel in the course of the Study.

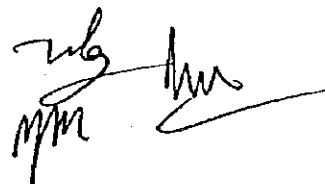
## III. STUDY AREA

The Study will cover following twenty (20) communes in five (5) provinces (Ha Noi, Ninh Binh, Thanh Hoa, Ha Tinh, Thai Nguyen ) as attached in the Annex.

## IV. SCOPE OF THE STUDY

Stage I: Data Collection and Evaluation of Present Condition

1. Collection, review and analysis of related data and information
  - a. social and economic conditions
  - b. natural conditions (topographical maps, hydrogeological maps, meteorological data, hydrological data, geological data, aerial photo, etc.)
  - c. other projects relevant to the Study
  - d. existing well data and existing water supply services
  - e. sanitary conditions
  - f. present conditions and policies related to "Women in Development (WID)"
  - g. laws, regulations and policies on water resource development, water supply and sanitation
  - h. other relevant data and information
2. Diagnostic survey of existing water supply facilities
3. Water quality analysis for existing water supply facilities
4. Survey on actual conditions of 20 communes



- a. condition of water use and sanitation
- b. social and economic aspects
- c. people's awareness on health and hygiene and their willingness to pay for better water supply services
- d. cultures and habits on water supply and sanitation
- e. women's situation in society

5. Initial Environmental Evaluation (IEE)

Stage 2: Water Resources Potential Survey

- 1. Field reconnaissance
  - a. topographical and geological investigation
  - b. rivers and springs
  - c. hydrogeological investigation
- 2. Preparation of inventory of existing wells
- 3. Geophysical exploration
- 4. Test well construction, well logging, pumping test and water quality analysis
- 5. Leveling survey for observation wells
- 6. Observation of groundwater level
- 7. Observation of river flow and water quality analysis
- 8. Evaluation of water resources potential

Stage 3: Long-Term Development Plan for Water Supply

- 1. Water demand projection and confirmation of planning framework
- 2. Formulation of water resources development plan
- 3. Formulation of water supply facility plan
- 4. Formulation of operation and maintenance plan and institutional development plan
- 5. Public and individual hygienic awareness improvement plan
- 6. Cost Estimation
- 7. Evaluation
  - a. socio-economic evaluation
  - b. institutional and technical evaluation
  - c. environmental impact
- 8. Formulation of implementation program

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9. Selection of project(s) for feasibility study

Stage 4: Feasibility Study on the Selected Project(s)

1. Supplementary investigation
2. Confirmation of planning framework
3. Formulation of groundwater development plan
4. Formulation of water supply facility plan
5. Preliminary design of facilities
6. Cost Estimation and financial plan
7. Formulation of operation and maintenance plan and institutional development plan
8. Evaluation
  - a. financial and economic evaluation
  - b. institutional and technical evaluation
  - c. social evaluation
  - d. environmental impact assessment (EIA)
9. Formulation of implementation program

**V. SCHEDULE OF THE STUDY**

The Study will be carried out in accordance with the tentative schedule as attached in the appendix. The schedule is tentative and subject to modification if such necessity should arise during the course of the Study and mutually agreed to by both parties.

**VI. REPORTS**

JICA shall prepare and submit the following reports in English to the Government of Viet Nam.

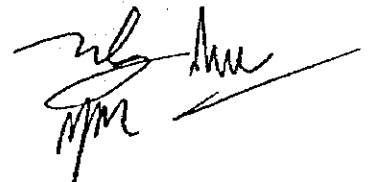
1. Inception Report:

Thirty (30) copies at the commencement of the first work period in Viet Nam. This report will contain the schedule and methodology of the Study as well as outline of the field survey.

2. Progress Report :

Thirty (30) copies about five (5) months after the commencement of the first work period in Viet Nam.

3. Interim Report:



Thirty (30) copies at the end of the first work period in Viet Nam. This report will summarize the findings of the first field survey.

4. Draft Final Report:

Thirty (30) copies at the third work period in Viet Nam. The Government of Viet Nam shall submit its comments within one (1) month after the receipt of the Draft Final Report.

5. Final Report:

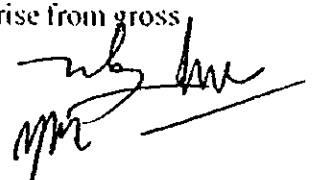
Fifty (50) copies within two (2) months after the receipt of the comments on the Draft Final Report.

**VII. UNDERTAKINGS OF THE GOVERNMENT OF VIET NAM**

1. To facilitate the smooth conduct of the Study, the Government of Viet Nam will take the following necessary measures:

- (1) To secure the safety of the Japanese study team (hereinafter referred to as "the Team")
- (2) To permit the members of the Team to enter, leave and sojourn in Viet Nam for the duration of their assignment therein, and exempt them from foreign registration requirements and consular fees
- (3) To exempt the members of the Team from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into Viet Nam for the conduct of the Study
- (4) To exempt the members of the Team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Team for their services in connection with the implementation of the Study
- (5) To provide necessary facilities to the Team for remittance as well as utilization of the funds introduced into Viet Nam from Japan in connection with the implementation of the Study
- (6) To secure permission for the Team to enter into private properties or restricted areas for the implementation of the Study
- (7) To secure permission for the Team to take all data and documents (including photographs and maps) related to the Study out of Viet Nam to Japan
- (8) To provide medical services as needed, expenses for which will be chargeable to the members of the Team.

2. The Government of Viet Nam shall bear claims, if any arises, against the members of the Team resulting from, occurring in the course of, or otherwise connected with, the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or willful misconduct on the part of the member of the Team.



3. Ministry of Agriculture and Rural Development (hereinafter referred to as "the MARD") shall act as a counterpart agency to the Team and also as a coordinating body in relation with other governmental and non-governmental organizations for the smooth implementation of the Study. The MARD shall, at its own expense, provide the Team with the followings, in cooperation with other organizations concerned:

- (1) available data and information relevant to the Study
- (2) counterpart personnel
- (3) suitable office space with necessary equipment in Hanoi
- (4) credentials or identification cards
- (5) an appropriate number of vehicles with drivers.

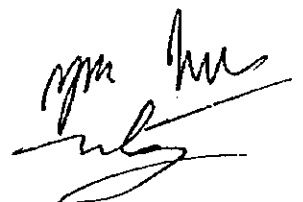
#### **VIII. UNDERTAKINGS OF JICA**

For the implementation of the Study, JICA shall take the following measures:

1. to dispatch, at its own expense, study teams to Viet Nam
2. to pursue technology transfer to counterpart personnel in the course of the Study.

#### **IX. CONSULTATION**

JICA and the Ministry of Agriculture and Rural Development shall consult with each other in respect of any matter that may arise from or in connection with the Study.

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APPENDIX

The Study on  
Groundwater Development in the Rural Provinces of Northern Part  
in the Socialist Republic of Viet Nam

TENTATIVE SCHEDULE

MONTH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
DESCRIPTION																							
WORK IN VIET NAM																							
WORK IN JAPAN																							
REPORT PRESENTATION	▲					▲					▲				▲								
	IC/R					P/R					IT/R				DF/R								

NOTE IC/R : Inception Report  
P/R : Progress Report  
IT/R : Interim Report  
DF/R : Draft Final Report  
F/R : Final Report

## STUDY AREA

Province	District	Commune
Ha Noi	Tu Liem	Xuan Dinh
		Dong Ngac
Ninh Binh	Tam Diep Town	Quang Son
	Yen Mo	Yen Thang
	Nho Quan	Dong Phong
Thanh Hoa	Nong Cong	Nong Cong Town
		Van Thang
	Thieu Hoa	Thieu Hung
		Thieu Do
	Yen Dinh	Dinh Tuong
	Vinh Loc	Vinh Loc Town
		Vinh Thanh
Ha Tinh	Duc Tho	Duc Yen
		Yen Ho
		Trung Le
		Duc Xa
Thai Nguyen	Dong Hy	Dong Bam
		Hoa Thuong
	Pho Yen	Nam Tien
	Thai Nguyen Town	Thinh Duc



4. M/M (英文)

MINUTES OF MEETINGS  
ON  
SCOPE OF WORK  
FOR  
THE STUDY  
ON  
GROUNDWATER DEVELOPMENT  
IN  
THE RURAL PROVINCES OF NORTHERN PART  
IN  
THE SOCIALIST REPUBLIC OF VIETNAM

AGREED UPON BETWEEN

THE MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT

AND

THE JAPAN INTERNATIONAL COOPERATION AGENCY

Hanoi, January 23, 1998



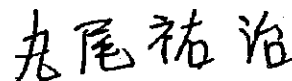
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Dr. Nguyen Ich CHUONG  
Deputy Director  
Department of International Cooperation,  
Ministry of Agriculture and Rural Development



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Mr. Nguyen Trong TIN  
Deputy General Director of Infrastructure Department,  
Ministry of Planning and Investment



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Dr. Yuji MARUO  
Leader of the Preparatory Study Team  
Japan International Cooperation  
Agency (JICA)

## 1. INTRODUCTION

In response to the official request of the Government of the Socialist Republic of Viet Nam (hereinafter referred to as "the Government of Viet Nam"), the Preparatory Study Team (hereinafter referred to as "the Team") of the Japan International Cooperation Agency (hereinafter referred to as "JICA") visited Viet Nam from January 11 to 24, 1998, to discuss the Scope of Work (hereinafter referred to as "S/W") for the Study on Groundwater Development (hereinafter referred to as "the Study") in the Rural Provinces of Northern Part in the Socialist Republic of Viet Nam.

The Team carried out field surveys in the study area and held a series of discussions with the authorities concerned of the Ministry of Agriculture and Rural Development (hereinafter referred to as "the MARD"), the Ministry of Planning and Investment (hereinafter referred to as "the MPI") and other organizations.

The list of attendants is shown in the Appendix.

The Minutes of Meetings were prepared for the better understanding of the S/W agreed upon between the MARD, the MPI and the Team on January 23, 1998, summarizing the main points of the discussions made in the course of the preparation of the S/W.

## 2. Explanation of JICA's Program

The Team explained JICA's Development Study Program. The Vietnamese side understood the Program.

## 3. Study Title

The title of the Study will be "the Study on Groundwater Development in the Rural Provinces of Northern Part in the Socialist Republic of Viet Nam" as described in the S/W.

## 4. Selection of Priority Projects

After formulating a groundwater development plan and a long-term water supply plan for twenty (20) communes, the JICA and the Development Study Team will select some priority projects.

The Vietnamese side requested to undertake feasibility study for all the twenty (20) communes as selected priority projects.

The Team would convey the request to Japan for consideration.

## 5. Schedule of the Development Study

Considering urgent needs in improving water supply conditions at those area, the Vietnamese side requested to shorten the duration of the Study to as short as twelve (12) months.

The Team would convey the request to Japan for consideration.

## 6. Target Year

The Team explained that the target year for the long-term water supply plan should be 2010 and the target year for the feasibility study should be 2005.

The Vietnamese side understood the proposal and agreed to it.

## 7. Counterpart Training

The Team explained that JICA could conduct counterpart training in Japan for an official from concerned organizations for the purpose of the smooth transfer of technology during the Study.

The Vietnamese side requested that the number of the counterpart training in Japan would be three (3) officials.

The Team explained that this request for the number of the counterpart training could not be

accepted by JICA H.Q. because of budgetary conditions. And the training period, training field and selection of personnel should be mutually discussed after commencement of the Study.

The Team agreed to convey this request of counterpart training to Japan for consideration.

#### **8. Technology Transfer Seminar**

Technology transfer seminar will be held during the course of the Study mainly to disseminate the outcome of the Study among the relevant personnel including officials from provinces, districts and communes. The details of seminar will be discussed between the Vietnamese side and the Development Study Team after commencement of the Study.

#### **9. Reports**

As for the Study reports, the Vietnamese side agreed to make them open to the public after completion of the Study in order to achieve maximum use of the Study results.

#### **10. Vietnamese Summaries**

The Vietnamese side requested that the Development Study Team would make the Vietnamese summaries for the Study reports.

The Team would convey the request to Japan for consideration.

#### **11. Geophysical Exploration and Test Well Drilling**

The Team explained that geophysical exploration, namely electric resistivity survey and electro-magnetic survey, and test well drillings would be carried out during the course of the Study. The test well drillings would be conducted by local drilling contractor(s) on the contract basis with the Development Study Team.

The Vietnamese side requested to Japanese side to provide the necessary geophysical equipment.

#### **12. Well Inventory Data Base**

Both sides acknowledged the necessity of making well inventory data base at the provincial level as well as central government level. In this respect, the Vietnamese side requested to Japanese side to provide some computers with printers and G.P.S. to the respective provinces and the CERWASS as well. Data input will be carried out by the Vietnamese side.

#### **13. Office Space and Office Equipment**

The Vietnamese side will prepare a suitable office space for the Development Study Team at the respective capital of Ninh Binh, Thanh Hoa, Ha Tinh and Thai Nguyen. As for an office in Hanoi, the Vietnamese side will arrange a rental room at the same locality as the CERWASS.

Charges for telecommunication and electricity, and room rental in case of Hanoi, should be covered by the Development Study Team.

Necessary equipment such as photo-copy machine, facsimile machine etc. should also be provided by JICA.

#### **14. Local Procurement of Equipment**

The Vietnamese side pointed out that certain equipment such as photo-copy machine, computer, printer, facsimile machine and potable water quality analyzer should be procured at Vietnamese local market for effective maintenance services.

#### **15. Donation of Equipment**

The Team explained that in case the Vietnamese side require the equipment procured by JICA for their use after the completion of the Study, the issue should be discussed in the course of the

Study observing the progress and achieved level of technology transfer.

The Team also explained that provision of such equipments would be considered upon official request by the Vietnamese side in the event that technology transfer is considered successful.

#### **16. Vietnamese Interpreter**

The Vietnamese side explained that some Vietnamese interpreters could act an important role in the Study particularly for the site survey in the rural area.

The Vietnamese side requested that JICA would employ some Vietnamese interpreters for the smooth conduct of the Study.

The Team would convey the request to Japan for consideration.

#### **17. Local Expertise**

The Vietnamese side requested to make good use of Vietnamese local expertise in the Development Study.

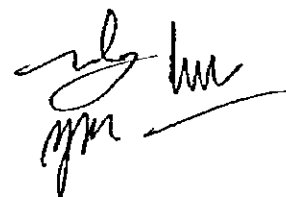
The Team would convey the request to Japan for consideration.

#### **18. Counterpart Personnel**

Both sides agreed that following personnel of the respective speciality would be necessary to conduct the Study.

- a. Leader
- b. Hydrogeology
- c. Hydrology
- d. Water Quality Analysis
- e. Geophysical Exploration
- f. Drill Work Engineering
- g. Water Supply Planning
- h. Hygienic Awareness Improvement Planning
- i. Water Supply Facility Planning / Cost Estimation
- j. Sociology
- k. Institution Planning

The Vietnamese side agreed that they would secure many counterpart personnel as possible to the JICA Study Team. The number and fields of counterpart personnel would, however, be finalized by the Vietnamese side and the JICA Study Team throughout discussions at the commencement of the Study.

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## APPENDIX

### LIST of ATTENDANTS

#### (Vietnamese side)

##### Ministry of Agriculture and Rural Development

Dr. Nguyen Ich CHUONG	Deputy Director, Department of International Cooperation
Dr. Dang Dinh PHUC	Chief of Bureau for Management of Groundwater Resources
Ms. Dao Thi LOC	Expert, Department of International Cooperation

##### Centre for Rural Water Supply and Environmental Sanitation

Mr. Le Van CAN	Director
Mr. Pham Duc NAM	Vice Director
Ms. Ha Thanh HANG	Chief, Department of Plan and Investment
Mr. Le Thieu SON	Head of Technical and Capital Construction Department

##### Ministry of Planning and Investment

Mr. Nguyen Trong TIN	Deputy General Director of Infrastructure Department
Ms. Le Tu OANH	Expert, Infrastructure Cooperation

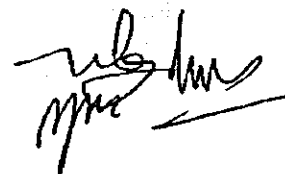
#### (Japanese side)

##### Preparatory Study Team

Dr. Yuji MARUO	Leader
Mr. Masahiro CHIBA	Study Manager
Mr. Makoto SUGA	Member
Mr. Takashi SUZUKI	Member
Mr. Atsuhiko NARITA	Member
Ms. Hiroko TAKAYA	Interpreter

##### JICA Expert

Mr. Takamichi IWAI	Expert in Irrigation and Drainage
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## 5. 質問票と回答

### Socioeconomic and Administrative issues

No.	Information & Data Required	Available or Not Available	Title and Source	Requesting in This Study
1	Organizations of related agencies * Ministry of Agriculture and Rural Development * Ministry of Science, Technology, and environment * Center for Rural Water Supply and Environmental Sanitation * Five target Provinces	Yes	* Ministry of Agriculture and Rural Development (MARD) * Ministry of Science, Technology and Environment (MOSTE) * Center for Rural Water Supply and Environmental Sanitation (CERWASS)	○
2	List of target District for the Study and their distribution maps	Yes	CERWASS of Province	○
3	Population statistics * Five target Provinces * Target Districts	Yes	- Central and Province CERWASS - Statistical Year Book - 1995 General Statistical Office	
4	Economic Indications * State * Five target Provinces	Yes	Statistical Year Book Statistical Year Book of each province	○
5	Industrial statistics (five target Provinces)	Yes	Statistical Year Book of each province	
6	Finances and budgets of local Governments (five target Provinces)	Yes	The annual report of People's committee	
7	Infrastructure development * Road and traffic * Electric power * Waterworks and sewage system * Irrigation system	Yes	Statistical Data on Basic Situation and Infrastructure of Rural Region in Vietnam (1995 - General Statistical Office)	
8	Statistics of health and sanitation * State * Five target Provinces	Yes	- Statistic Year Book of Health in 1995 - Ministry of Health (MOH) - National Rural Water Supply and Sanitation Strategy Study (NRWSS) - 1977	○

**Present States of Waterworks and Environment Sectors (1/2)**

No.	Information & Data Required	Available or Not Available	Title and Source	Requesting in This Study
1	Laws, ordinances and standards for waterworks and health	Yes	Vietnam Construction Norms	○
2	Targets and action plans of the Government for waterworks and health * Central Government level * Local Government level	Yes	- Master plan for rural drinking water supply in Vietnam upto year 2000 (CERWASS) - Vietnam - UNICEF National cooperation 1996 - 2000 (CERWASS) - Instruction 200/TTg of Prime Minister	
3	Coverage of sage domestic water supply * State * Five target Provinces	Yes	- Vietnam - UNICEF National cooperation 1996 - 2000	
4	Spread of domestic sanitary facilities in * State * Five target Provinces	Yes	CERWASS and UNICEF	
5	Current prevalence of waterborne and related diseases	Yes	- MOH - UNICEF - NRWSS	
6	Governmental organizations for waterworks and sanitary * Central * Local	Yes	- CERWASS - Water supply company - Department of Health (Provincial level)	○
7	Residents participation in waterworks and sanitary system	Yes	CERWASS of Province	
8	Laws and regulations for environment management * Environment conservation law * Water quality standard * Others	Yes	Law on Environmental Protection Water quality standard for drinking and domestic (MOH) Water Law (Draft)	○
9	Governmental organization for environmental management	Yes	- MOSTE - DOSTE - MARD and DARD	○
10	System and implementation procedure of EIA	Yes	MOSTE	○
11	Environmental issues and pollution in five target Province	Yes	Present state of water pollution	

**Present States of Waterworks and Environment Sectors (2/2)**

12	Residents training and human resource development in the Sector	Yes	National capacity Assessment for Water Resources Management (UNOPS, Kampsax)	
13	Progressing/intending Studies and Projects in the Sector * Groundwater development * Water supply project * Environment / pollution control * Public health		<ul style="list-style-type: none"> <li>- National Rural Water Supply and sanitation strategy study (DANIDA)</li> <li>- Vietnam - UNICEF national cooperation in 1996 - 2000 (CERWASS and UNICEF)</li> <li>- Red River Delta Master Plan (UNDP)</li> <li>- Rural water supply master plan (in some provinces)</li> <li>- The Development of water and Sanitation Sector Strategy and Action plans (UNDP) -1989</li> </ul>	○
14	Priority regions in the Sector * for groundwater development * for water supply system * for environment improvement	No		○
15	Foreign aids for the Sector	Yes	UNICEF, SIDA, DANIDA, UNDP, ADB, WB, EAST...	○



### Present States of Water Supply System

No.	Information & Data Required	Available or Not Available	Title and Source	Requesting in This Study
1	List of water supply districts in target areas	Yes	CERWASS	<input type="radio"/>
2	Water quality characteristics and analysis data in the target areas	Yes	- CERWASS - Preventive Health Care Centres	<input type="radio"/>
3	Patterns of existing water supply systems	Yes	CERWASS and Water Supply Company	<input type="radio"/>
4	Water demand and supply in target Provinces * Domestic water * Agriculture water * Others	Yes	- CERWASS of Province - DXARD	<input type="radio"/>
5	List of working facilities for water supply (for five target Provinces)	Yes	CERWASS and Water Supply Company	
6	Troubles in working water supply systems * Suspension of water supply * Insufficient pressure * Poor quality * Leakage * Others	No	Non account	
7	Criteria of water supply planning * Mean water consumption rate (per capita per day) * Water quality standard * Level of service (water point, public hydrant and house connection) * Metering	Yes	Vietnam construction norms (MOC)	<input type="radio"/>
8	Water charge system and collection results			
9	Maintenance of facility * contribution by users * Role of District Role of Province Role of Private enterprise			<input type="radio"/>
10	Investment plan and finances			

**Meteorology • Hydrology • Topography and Basin Drainage**

No.	Information & Data Required	Available or Not Available	Title and Source	Requesting in This Study
1	Projected Sites and Water Supply Scheme, as detail as possible * General Plan • Water Supply System and Reports	Yes	CERWASS	○
2	Topographical map concerning Study Area * Location of General Plan * Map Showing the Detail Location in Large Scale	Yes	CERWASS of Province	○
3	Aerial Photo and/or Satellite Image concerning Study Area	Yes	NIAP	
4	Meteorological Data concerning Study Area * Location Map of Observation Station * Data for the last 10 years	Yes	General Department of Hydro-meteorology (HMS)	○
5	Hydrological Data concerning Study Area * Location Map of Observation Station * Data for the last 10 years	Yes	Vietnam Hydro-meteorology Atlas -1944	○
6	Data of Drainage Basin concerning Study Area * Rivers, Lakes and Marshes * Scale of Rivers * Catchment Area * Rate of Runoff	Yes	Department of Agriculture and Rural Development (DARD)	○
7	Surface Water Development Plan, e.g.. Dam and Reservoir, if available	Yes	MARD	
8	Authorities and Agencies Concerned in these Items (Governmental and/or Private) * Meteorology and Hydrology * Topography * River Management	Yes	HMS MARD	

### Groundwater • Geology (1/2)

No.	Information & Data Required	Available or Not Available	Title and Source	Requesting in This Study
1	Geological Map of: * Whole of Vietnam * Study Area (Scale 1:50000)	Yes	Geology Department (MOI) Geology Department	
2	Hydrogeological Map of: * Whole of Vietnam * Study Area (Scale 1:50000)	Yes	CERWASS and Geology Department (MOI)	○
3	Contour Map of Piezometric Level and its fluctuation concerning: * Drainage Basin related to Study Area * Piezometric Level recent and past * Location Map of Observation Station * A Secular Change	Yes	Northern Hydro-Geological Division	○
4	Geophysical Exploration Data concerning Study Area	Yes		
5	Data of Drilling and Test for Well around Study Area * Report on Drilling, Test and Construction Work of Respective Well * Pumping Test Data	Yes	Northern Hydro-Geological Division and CERWASS	○
6	Inventory of Wells around Study Area * Location Map of Well * Specification of Well * Monitoring Data * Discharge Ratio	Yes	Center and Province CERWASS  UNICEF Hanoi	○
7	Inventory of Springs around Study Area * Location • Discharge Volume • Discharging Strata	Yes		
8	Present Usage and Future Demand of Groundwater	Yes	- MARD - NRWSS	
9	Laws, Regulations, Standards and Water Right related to the Groundwater Development and Conservation	Yes	- Issuing the Provisional Regulation on the Granting of Permits for ground water Prospection, Exploitation, Drilling and the Registration of ground water exploitation works - Decision No 357 - MARD - Water Law (Draft)	

**Groundwater • Geology (2/2)**

10	Recent and Future Activities for the Management of Groundwater Development	Yes	Evaluation, management and protection of climate and water resources in Vietnam (IHP) Assessment of water resources and water uses in the Socialist Republic of Vietnam (IHP)	
11	Cost of Groundwater Development such as: * Well Construction, O & M * Submergible Pump, Installing Pipe	Yes	Ministry of Construction (MOC)	
12	Authority who controls Groundwater Development and Usage Authorities and Agencies Concerned in these Items (Governmental and/or Private)  * Geology * Groundwater	Yes	- Geology Department (Ministry of industry) - MARD	

### Planning for Arrangement of Drilling, Tools and Machinery

No.	Information & Data Required	Available or Not Available	Title and Source	Requesting in This Study
1	<p>List of Local Company (Name, Representatives, Telephone and Facsimile Number, and Address)</p> <ul style="list-style-type: none"> <li>* Drilling Company</li> <li>* Consultants</li> <li>* Geophysical Exploring Company</li> <li>* Surveyors</li> <li>* Construction Company</li> <li>* Dealers of Drilling Tools and Materials</li> <li>* Water Quality Analysis Assayers</li> <li>* Rigmachine Makers</li> <li>* Pumps Dealers</li> <li>* Dealers of Well Constructing Tools &amp; Materials</li> <li>* Car Dealers and Rent a Lease Services</li> </ul>	<p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>Yes</p> <p>No</p> <p>Yes</p> <p>Yes</p> <p>Yes</p>	<ul style="list-style-type: none"> <li>- Northern Hydro-Geology Division Tel: 8346861</li> <li>- Ground water exploitation Company No.1 Tel: 8615312</li> <li>- Vietnam Consultant on Water Supply and Sanitation Tel: 8243666</li> <li>- Center of Geology and Environment - Hanoi Mining and Geology University - Hydro-Geology Department</li> <li>- Hanoi International Geology Division Tel: 8343483</li> <li>- Northern Hydro-Geology Division Tel: 8346861</li> <li>- Exploitation Enterprises Union - MOC</li> <li>- Northern Hydro-Geology Division Tel: 8346861</li> <li>- CERWASS and Consultant on Water supply and Sanitation</li> <li>- Industry Chemical Institute</li> <li>- Northern Hydro-Geology Division Tel: 8346861</li> <li>- Hanoi Mining and Geology University</li> <li>- Water material shop</li> <li>- Hanoi Servico</li> </ul>	<p>○</p>
2	<p>List of Drilling Company in neighbor Countries (Companies having the record of working in Vietnam)</p> <ul style="list-style-type: none"> <li>* Name and Representatives</li> <li>* Telephone and Facsimile Numbers</li> <li>* Address</li> </ul>	<p>Impossible</p>		

3	<b>Tools and Machinery held in stock by concerning Governmental Agencies</b> <b>(List of Tools &amp; Machinery, Quantities, Date manufactured, Specification)</b> * Rigmachine, Vehicles * Pumping Test Equipment * Geophysical Exploration & Logging Equipment * Water Quality Analysis Equipment * Maintenance Garage	Yes		○
4	<b>Groundwater Development Agencies</b> * Organization Chart, Personnel, Engineers			○
5	<b>Present Unit Prices</b> * As Attached Sheets			○

6. 収集資料リスト (  収集資料 /  専門家作成資料 )

平成10年3月 日 作成

主管部長 長	文書管理課 主管課長 長	情報管理課 技術情報課 長	図書館受入日
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地域	プロジェクトID	調査団番号	調査の種類又は有 連科目	調査の種別又は有 連科目	発行機関	取扱区分	図書館記入欄
東南アジア			北部地方地下水開発計画調査 家氏名	開発調査 (事前調査)			社会開発調査部第2課
国名	グエトナム国		配属機関名	現地調査期間又は 派遣期間			担当者氏名 千葉雅広
98年1月6日~98年1月22日							
番号	資料の名称	形態 (図書、ビデオ、 地図、写真等)	収集 資料	専門家 作成資料	JICA 作成資料	スキ スト	図書館記入欄
1.	社会・経済統計資料						
1-1.	STATISTICAL YEARBOOK 1995	図書	○				JR-CR( )・SC
1-2.	STATISTICAL YEARBOOK 1996	図書	○				JB-CR( )・SC
1-3.	AGRICULTURE OF VIETNAM 1945 - 1995	図書	○				JB-CR( )・SC
1-4.	VIETNAM'S ECONOMY THE PERIOD 1945 - 1995 AND ITS PERSPECTIVE BY THE YEAR 2020.	図書	○				JB-CR( )・SC
1-5.	SOCIAL INDICATORS IN VIET NAM 1990 - 1995	図書	○				JB-CR( )・SC
1-6.	VIET NAM DANH GIA TONG QUAN NGANH THUY LOI	図書	○				JB-CR( )・SC
1-7.	タンホア省経済指標	コピー	○				JB-CR( )・SC
1-8.	タンホア省県統計情報	コピー	○				JB-CR( )・SC
1-9.	ニンビン省統計情報	コピー	○				JB-CR( )・SC
1-10.	タイグエン省、県、コミュニケーション情報	コピー	○				JB-CR( )・SC

番号	資料の名称	形態(図書、ビデオ、 地図、写真等)	収集 資料	専門家 作成資料	JICA 作成資料	テキ スト	発行機関	取扱区分	図書館記入欄
1-11.	ハノイ市ドンナックコミュニティ統計情報	コピー	○				ドンナックコミュニティ	JB・CR( )・SC	
1-12.	ニンビン省コミュニティ統計	コピー	○				ニンビン省コミュニティ	JB・CR( )・SC	
1-13.	タンホア省コミュニティ統計	コピー	○				タンホア省コミュニティ	JB・CR( )・SC	
1-14.	ハテイン省コミュニティ統計	コピー	○				ハテイン省コミュニティ	JB・CR( )・SC	
1-15.	VIET NAM the country and its geographical regions	図書	○				THE GIOT PUBLISHERS	JB・CR( )・SC	
2.	組織図							JR・CR( )・SC	
2-1.	県人民委員会組織図	コピー					タンホア省・ハテイン省	JB・CR( )・SC	
2-2.	省地方給水・環境衛生部組織図	コピー	○				タイグエン・ハノイ・ニン ビン・タンホア・ハテイン 省地方給水・衛生課課部	JB・CR( )・SC	
2-3.	コミュニティ人民委員会組織図	コピー	○				各コミュニティ	JB・CR( )・SC	
3.	給水関連資料							JR・CR( )・SC	
3-1.	水質分析例	コピー	○				各地方給水・衛生 環境部	JB・CR( )・SC	



番号	資料の名称	形態(図書・ビデオ・ 地図・写真等)	収集 資料	専門家 作成資料	JICA 作成資料	デキ スト	発行機関	取扱区分	図書館記入欄
3-2.	Regulation on the exploitation production management supply and using of ground water in Hanoi	コピー	○				ハノイ人民委員会	①J・CR( )・SC	
3-3.	SANITATION STANDARDS OF SUPPLIED QUALITY	コピー	○					①J・CR( )・SC	
3-4.	タイグエン省水質分析データ	コピー	○				建設大学工業都市環境技術センター	①J・CR( )・SC	
3-5.	タインホア省内の地下水水質調査データ	コピー	○					①J・CR( )・SC	
3-6.	ハノイ市内の地下水水質調査データ	コピー	○					①J・CR( )・SC	
3-7.	水利用基準	コピー	○					①J・CR( )・SC	
3-8.	グアイナム地方都市衛生給水プロジェクト	コピー	○				フーストクワ国際開発機関・ ハノイ省人民委員会・建 設省	①J・CR( )・SC	
3-9.	ハティン省における井戸インベントリー 例	部分コピー	○					①J・CR( )・SC	
4.	水理地質関連資料							JR・CR( )・SC	
4-1.	地質鉱物局によるタインホア省地質調査レポート	コピー	○				地質鉱物局	①J・CR( )・SC	
5.	地質図							JR・CR( )・SC	

番号	資料の名称	形態 (図書、ビデオ、地図、写真等)	複製資料	専門家作成資料	JICA作成資料	テキスト	発行機関	取扱区分	図書館記入欄
5-1.	Geological Map of Vietnam (Scale 1:500,000) one full set	判じカド	○				General Department of Mine and Geology of Vietnam	JR・CR( )・SC	
5-2.	Geological Map of Vietnam TO HA NOI (Scale:200,000)	判じカド	○				General Geological Directorate Geological Survey Inter-Group	JR・CR( )・SC	
5-3.	Geological Map of Vietnam TO NINH BINH (Scale 1:200,000)	判じカド	○				General Geological Directorate Geological Survey Inter-Group	JR・CR( )・SC	
5-4.	Geological Map of Vietnam THANH HOA (Scale 1:200,000)	判じカド	○				General Geological Directorate Geological Survey Inter-Group	JR・CR( )・SC	
5-5.	Geological Map of Vietnam HA TINH・KY ANH (Scale 1:200,000)	判じカド	○				General Geological Directorate Geological Survey Inter-Group	JR・CR( )・SC	
6.	地図 (道路,行政) ・地形図							JR・CR( )・SC	
6-1.	道路地区(縮尺1:500,000) THAI NGUYEN	判じカド	○				MAP SURVEY ENTERPRIZE	JR・CR( )・SC	
6-2.	道路地図(縮尺1:500,000) HA NOI	判じカド	○				MAP SURVEY ENTERPRIZE	JR・CR( )・SC	
6-3.	道路地図(縮尺1:500,000) HA TINH	判じカド	○				地図管理局	JR・CR( )・SC	
6-4.	地形図(縮尺1:250,000) CAO BANG NF-48-7	判じカド	○				地図管理局	JR・CR( )・SC	
6-5.	地形図(縮尺1:250,000) YEN BAI NF-48-10	判じカド	○				地図管理局	JR・CR( )・SC	

番号	資料の名称	形態(図書・ビデオ・地図・写真等)	収録資料	専門家作成資料	JICA作成資料	データ	発行機関	取扱区分	図書館記入欄
6-6. 11	地形図(縮尺1:250,000) HA NOI NF-48-	初シ*カ	○				地図管理局	㊟・CR( )・SC	
6-7. 48-15	地形図(縮尺1:250,000) NAM DINH NF-	初シ*カ	○				地図管理局	㊟・CR( )・SC	
6-8. 48-2	地形図(縮尺1:250,000) CUA RAO NE-	初シ*カ	○				地図管理局	㊟・CR( )・SC	
6-9. NE-48-3	地形図(縮尺1:250,000) THANH HOA	初シ*カ	○				地図管理局	㊟・CR( )・SC	
6-10.	地形図(縮尺1:250,000) VINH NE-48-7	初シ*カ	○				地図管理局	㊟・CR( )・SC	
6-11. 6045 I	地形図(縮尺1:50,000) RAO QUA SHEET	初シ*カ	○				地図管理局	㊟・CR( )・SC	
6-12. 6145 IV	地形図(縮尺1:50,000) QUANG TE SHEET	初シ*カ	○				地図管理局	㊟・CR( )・SC	
6-13. 6146 III	地形図(縮尺1:50,000) VINH SHEET	初シ*カ	○				地図管理局	㊟・CR( )・SC	
6-14. SHEET 6148 I	地形図(縮尺1:50,000) THANH HOA	初シ*カ	○				地図管理局	㊟・CR( )・SC	
6-15. SHEET 6148 III	地形図(縮尺1:50,000) TONG CONG	初シ*カ	○				地図管理局	㊟・CR( )・SC	
6-16. 6148 IV	地形図(縮尺1:50,000) TRI CAN SHEET	初シ*カ	○				地図管理局	㊟・CR( )・SC	

番号	資料の名称	形態(図書・ビデオ・地図・写真等)	収集資料	専門家作成資料	JICA作成資料	テキスト	発行機関	取扱区分	図書館記入欄
6-17.	地形図(縮尺1:50,000) NINH BINH SHEET 6149 I	初シカ	○				地図管理局	TR・CR( )・SC	
6-18.	地形図(縮尺1:50,000) MAI XA SHEET 6149 II	初シカ	○				地図管理局	TR・CR( )・SC	
6-19.	地形図(縮尺1:50,000) VINH LOC SHEET 6149 III	初シカ	○				地図管理局	TR・CR( )・SC	
6-20.	地形図(縮尺1:50,000) HA DONG SHEET 6150 I	初シカ	○				地図管理局	TR・CR( )・SC	
6-21.	地形図(縮尺1:50,000) PHO CO SHEET 6151 I	初シカ	○				地図管理局	TR・CR( )・SC	
6-22.	地形図(縮尺1:50,000) VINH YEN SHEET 6151 IV	初シカ	○				地図管理局	TR・CR( )・SC	
6-23.	地形図(縮尺1:50,000) THAI NGUYEN SHEET 6152 II	初シカ	○				地図管理局	TR・CR( )・SC	
6-24.	地形図(縮尺1:50,000) PHAT DIEM SHEET 6249 III	初シカ	○				地図管理局	TR・CR( )・SC	
6-25.	地形図(縮尺1:50,000) MO TRANG SHEET 6252 III	初シカ	○				地図管理局	TR・CR( )・SC	
6-26.	BAC THAI 省行政地図(縮尺1:250,000)	初シカ	○				地図管理局	TR・CR( )・SC	
6-27.	HA NOI 市行政地図(縮尺1:100,000)	初シカ	○				地図管理局	TR・CR( )・SC	

番号	資料の名称	形態(図書・ビデオ・地図・写真等)	収集資料	専門家作成資料	JICA作成資料	テキスト	発行機関	取扱区分	図書館記入欄
6-28.	NINH BINH省行政地図(縮尺1:125,000)	ポスター	○				地図管理局	TR-CR( )-SC	
6-29.	NINH BINH省行政地図(縮尺1:100,000)	コピー	○				地図管理局	TR-CR( )-SC	
6-30.	THANH HOA省行政地図(縮尺1:300,000)	ポスター	○				地図管理局	TR-CR( )-SC	
6-31.	THANH HOA省行政地図(縮尺1:100,000)	コピー	○				地図管理局	TR-CR( )-SC	
6-32.	HA TINH省行政地図(縮尺1:250,000)	ポスター	○				地図管理局	TR-CR( )-SC	
6-33.	TAM DIEP TOWN行政地図(縮尺1:25,000)	コピー	○				地図管理局	TR-CR( )-SC	
6-34.	DUC THO県行政地図(縮尺1:25,000)	コピー	○				地図管理局	TR-CR( )-SC	
6-35.	Hanoi市Tu Liem県Xuan Dinh行政地図(縮尺1:5,000)	コピー	○				地図管理局	TR-CR( )-SC	
6-36.	Hanoi市Tu Liem県Dong Ngac行政地図(縮尺1:3,600)	コピー	○				地図管理局	TR-CR( )-SC	
6-37.	Ninh Binh省Yen Mo県Yen Thang行政地図(縮尺1:5,000)	コピー	○				地図管理局	TR-CR( )-SC	
6-38.	Ninh Binh省Nho Quan県Dong Phong行政地図(縮尺1:5,000)	コピー	○				地図管理局	TR-CR( )-SC	

番号	資料の名称	形態(図書・ビデオ、地図・写真等)	収集資料	専門家作成資料	JICA作成資料	テキスト	発行機関	取扱区分	図書館記入欄
6-39.	Thanh Hoa省Nong Cong Town行政地図(縮尺1:1,000)	コピー	○				地図管理局	TR・CR( )・SC	
6-40.	Thanh Hoa省Nong Cong県Van Thang行政地図(縮尺1:5,000)	コピー	○				地図管理局	TR・CR( )・SC	
6-41.	Thanh Hoa省Thieu Hoa県Thieu Hung行政地図(縮尺1:5,000)	コピー	○				地図管理局	TR・CR( )・SC	
6-42.	Thanh Hoa省Thieu Hoa県Thieu Do行政地図(縮尺1:2,500)	コピー	○				地図管理局	TR・CR( )・SC	
6-43.	Thanh Hoa省Yen Dinh県Dinh Tuong行政地図(縮尺1:5,000)	コピー	○				地図管理局	TR・CR( )・SC	
6-44.	Thanh Hoa省Vin Loc県Vin Loc Town行政地図(縮尺1:1,000)	コピー	○				地図管理局	TR・CR( )・SC	
6-45.	Thanh Hoa省Vin Loc県Vinh Thang行政地図(縮尺1:7,000)	コピー	○				地図管理局	TR・CR( )・SC	
6-46.	Ha Tinh省Duc Tho県Duc Yen行政地図(縮尺1:5,000)	コピー	○				地図管理局	TR・CR( )・SC	
6-47.	Ha Tinh省Duc Tho県Yen Ho行政地図(縮尺1:5,000)	コピー	○				地図管理局	TR・CR( )・SC	
6-48.	Ha Tinh省Duc Tho県Trung Le行政地図(縮尺1:10,000)	コピー	○				地図管理局	TR・CR( )・SC	
6-49.	Ha Tinh省Duc Tho県Duc Xa行政地図(縮尺1:5,000)	コピー	○				地図管理局	TR・CR( )・SC	

番号	資料の名称	形態(図書・ビデオ・地図・写真等)	収集資料	専門家作成資料	JICA作成資料	テープ	発行機関	取扱区分	図書館記入欄
6-50.	Thai Nguyen省 Dong Hy県 Dong Bam行政地図(縮尺 1:10,000)	コピー	○				地図管理局	TR-CR( )-SC	
6-51.	Thai Nguyen省 Dong Hy県 Hoa Thuong行政地図(縮尺 1:25,000)	コピー	○				地図管理局	TR-CR( )-SC	
7.	環境関連資料							JR-CR( )-SC	
7-1.	Government decree on guidance for the implementation of the law on environment protection	コピー	○					JB-CR( )-SC	
7-2.	Guide to prepare and to review on environment impact assessment for foreign direct investment projects	コピー	○				科学技術環境省	JB-CR( )-SC	
7-3.	ENVIRONMENT AND NATURAL RESOURCE MANAGEMENT	コピー	○				UNDP	JB-CR( )-SC	
7-4.	ASSESSMENT OF WATER RESOURCES AND WATER USES IN THE SOCIALIST REPUBLIC OF VIETNAM.	コピー	○				Vietnam National Committee	JB-CR( )-SC	
7-5.	PRESENT STATE OF WATER POLLUTION	部分コピー	○					JB-CR( )-SC	
8.	その他一般資料							JR-CR( )-SC	
8-1.	Vietnam Discovery	図書	○				THE STATISTICAL PUBLISHING HOUSE	JB-CR( )-SC	
8-2.	THE TRADITIONAL VILLAGE IN VIETNAM	図書	○				THE GIOI PUBLISHERS	JB-CR( )-SC	

番号	資料の名称	形態(図書・ビデオ・地図・写真等)	収集資料	専門家作成資料	JICA作成資料	テキスト	発行機関	取扱区分	図書館記入欄
8-3.	VIETNAM A LONG HISTORY	図書	○				THE GIOI PUBLISHERS	TR-CR( )-SC	
8-4.	TEN YEARS OF PROGRESS VIETNAM WOMEN FROM 1985 TO 1995	図書	○				PHUND PUBLISHING HOUSE	TR-CR( )-SC	
8-5.	Women and doi moi in Vietnam	図書	○				WOMAN PUBLISHING HOUSE	TR-CR( )-SC	
8-6.	1995年より施行された積算基準書	図書	○				NHA XUAT BAN XAY DUNG	TR-CR( )-SC	
8-7.	INTERGEO DIVISION (VIETNAM)のコスト表	コピー	○					TR-CR( )-SC	
								JR-CR( )-SC	
								JR-CR( )-SC	
								JR-CR( )-SC	
								JR-CR( )-SC	
								JR-CR( )-SC	
								JR-CR( )-SC	
								JR-CR( )-SC	



## 7. 必用資料入手先

本格調査団が必要とする各種資料の入手については、基本的にカウンターパート機関を通じて行う事となる。カウンターパート機関はMARDとその下部機関のCERWASSであるが、常に実務を共にするのはCERWASSであり、直接にはすべてここを通して行う事となる。各調査対象省における地方給水衛生環境プロジェクトの行政に関連するのは、CERWASSと各省人民委員会の管理の基にある各省地方給水衛生環境部と各県人民委員会、各コミューン人民委員会の3つであり、地方給水衛生環境についての責任者はそれぞれセンター所長および県およびコミューン人民委員会主席であるが、省人民委員会の場合は副主席となる。また省の農業農村開発局も間接的な関連機関となる。従ってこれら関連機関に存在する資料はCERWASSを通して、基本的にすべて彼らの購入と言う形式で入手は可能であろう。またヴェトナムでは政府組織のそれぞれの省はほとんど独立した組織で、各省間での横のつながりは非常に乏しい。従って省の垣根を飛び越えてデータのやりとりを行う機械は非常に少なく、もし行う場合は売買という形で行われる。従って他の機関に属する各種資料の入手については、定められた予算の範囲でカウンターパート機関のCERWASSが購入するというのが原則であるが、予算は極めて乏しく、折衝に非常に時間を要する。調査団の限られた時間内で資料入手のためには、CERWASSを通した上で、調査団の費用内で資料購入を行う方がスムーズに行くものと思われる。

### 井戸インベントリー

各調査対象地における手掘り井戸、ハンドポンプ井戸および共同井戸などは、前記の通りほぼ全数量がそれぞれ確認されているが、これらの井戸は地方給水衛生環境センターの関与しないところで、個人で作成されており、それらを系統的にまとめた井戸インベントリーは存在しない。

しかしUNICEF事業で行ったハンドポンプ井戸は、前述の通り、ハノイ市で1万数千本、ニンビン省で1,800本、タンホア省で10,000本、ハティン省で2,900本、タイグエン省で2,000本あるが、これらの実施機関は各省の地方給水衛生環境部であり、これらはインベントリーとしてすべてセンターにそろっており、入手可能である。

### その他の給水施設施工データ

UNICEF事業のハンドポンプ井戸以外でも地方給水衛生環境センターが関わった給水施設事業に関しては、センター内に施工データが存在し、入手可能である。例えばタンホア省Nong Cong県Van Thangコミューンにはランソン紙工場があり、これに給水するための深度40mの井戸がある。この井戸の掘削施工はタンホア省の地方給水衛生環境部が委託を受け実施したもので、井戸の掘削仕上げデータは入手可能である。

ハティン省のThach Ha県で建設中のパイプ給水は、資金20~30%をUNICEFが、残りをヴェトナム側が拠出しており、水源は深度100m・口径219~130mmの井戸で、掘削はDGMV下部機関が行っているが、維持管理はコミューン・県人民委員会ですべて省の地方給水衛生環境部も係わっており、この掘削および揚水データはハティン省の地方給水衛生環境部にある。ただしThach Ha県はDuc Tho県から離れており、井戸の仕様などの他は直接の参考データとならない。

その他の都市給水に関するデータはMOCおよびその下部機関の都市給水会社の下に存在するものと思われる。ただし事前調査で確認の範囲内では今回の調査対象地域内にデータはほとんど存在しな

った。

#### MARD 下部機関の行った地質調査データ

本調査業務の直接の関連機関ではないが、MARD の下部機関には、給水関係の井戸掘削業務など Ha Noi 市に事務所を置き全国展開している“地下水開発会社 No.1” という機関がある。本機関が対象の省内で行った業務にはタンホア省 Lang Chanh 県で深度 70m まで行われた試掘調査が一箇所ある。事前調査での確認の範囲では対象地域で行われた業務はなかったが、本機関が行った業務データに関しては MARD を通して、入手可能と思われる。ただし事前調査で確認の範囲内では今回の調査対象地域内にデータはほとんど存在しなかった。

#### 衛生画像及び空中写真

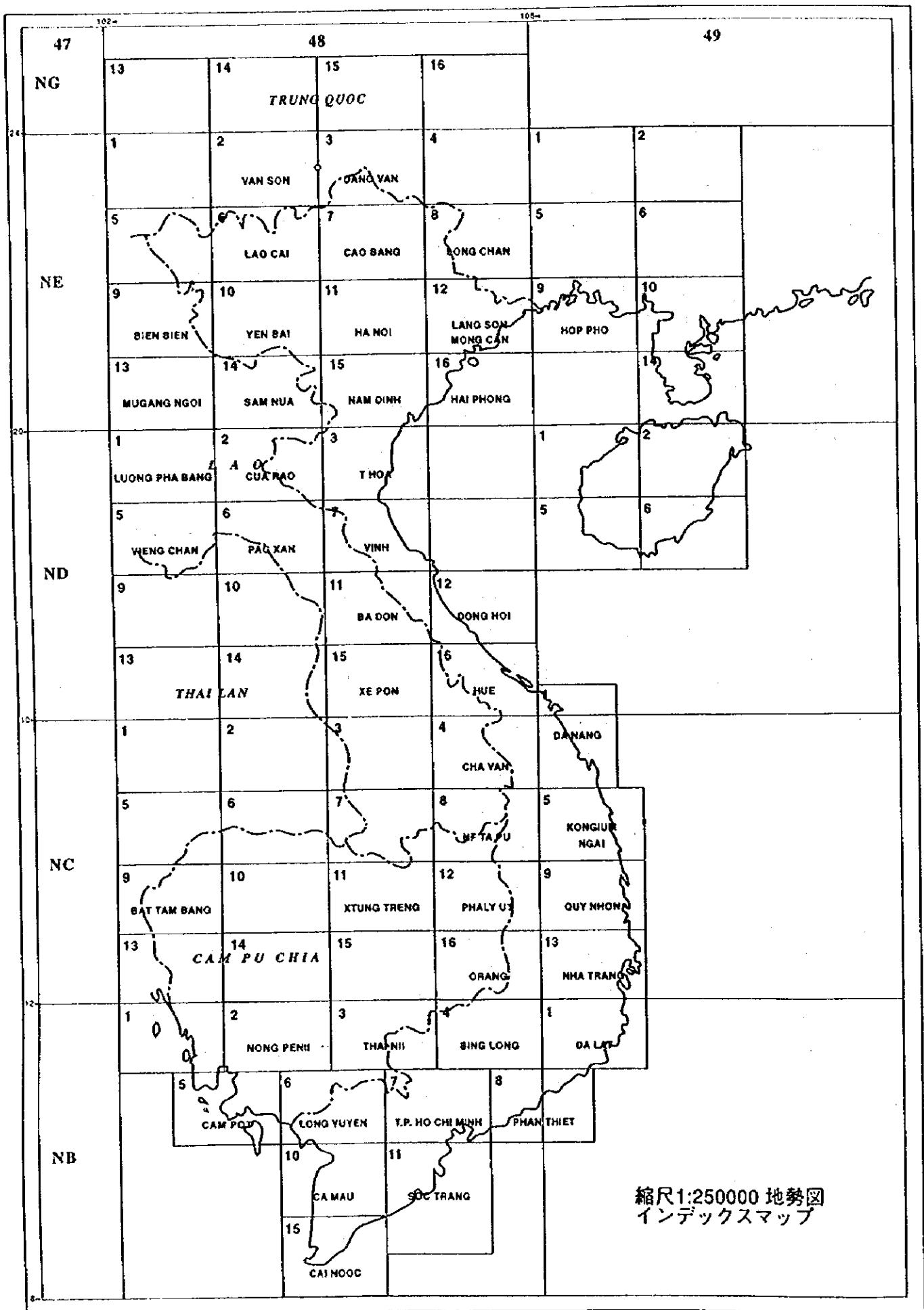
MARD の下部機関に NIAPP があり、衛生画像及び空中写真は本機関を通して購入可能である。衛生画像は LANDSAT 画像の場合、北部のみ入手可能で中部および南部の地域はヴィエトナム国内では入手が困難という事であった。SPOT 画像の場合はヴィエトナム国内のものは全国存在し、スケール 1:100,000 のもので 350 万 VND/枚 (285 US\$) である。

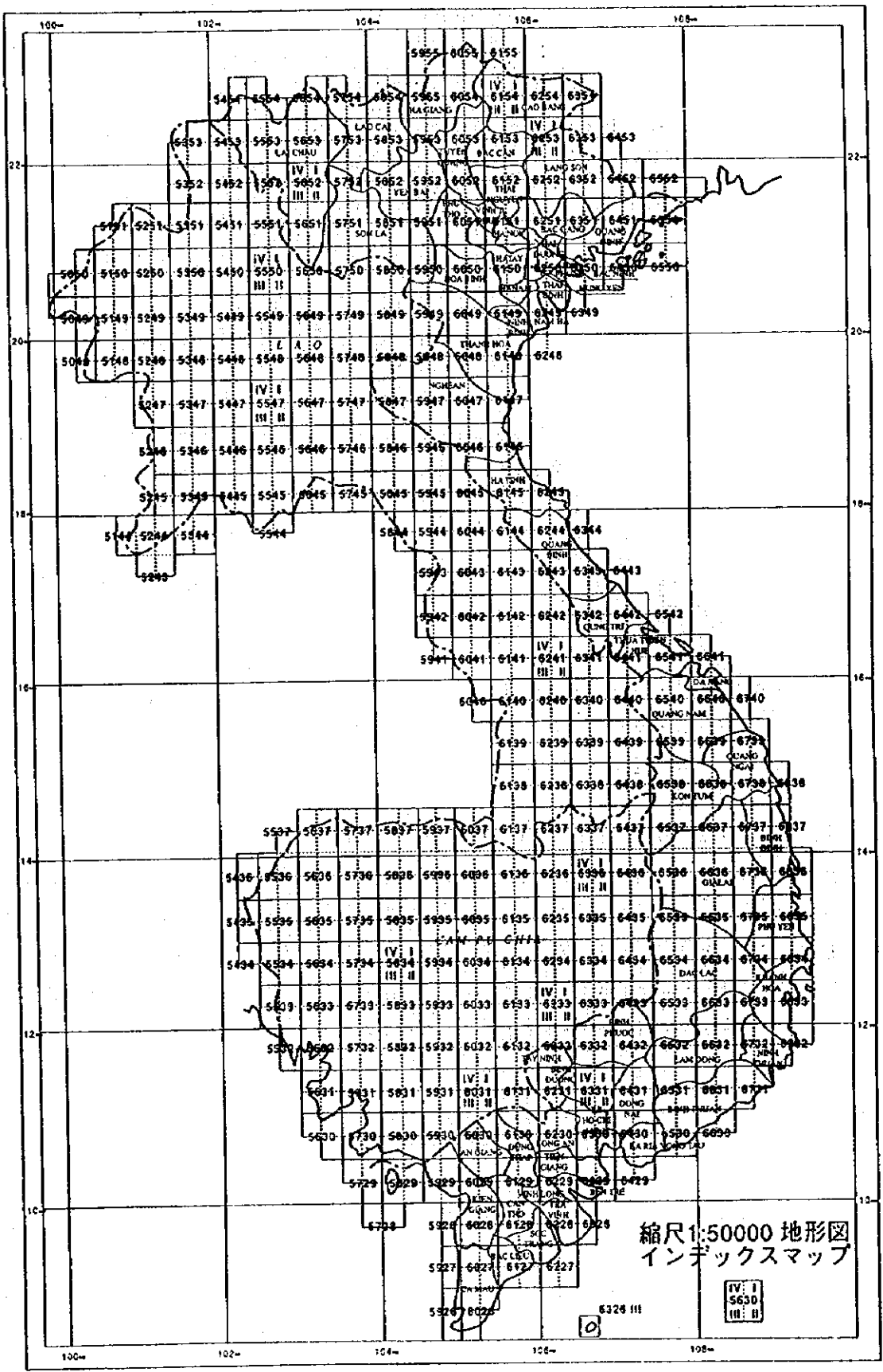
空中写真の場合、一般にスケール 1:20,000~1:30,000 で撮影が行われており、重要な都市部などはスケール 1:15,000 や 1:8,000 で撮影されている。スケール 1:25,000 の場合の撮影は一般に 2km 置きに行われており、面積にもよるが一つの県をカバーするのに平均ほぼ 300 枚程度必要とし、1:50,000 の地形図 1 枚をカバーするのに立体化なしで 25~30 枚(立体化させる場合はこの倍)必要である。スケール 1:15000 の場合は 1km 置きに撮影している。通常 1 枚 40,000VND (3.3 US\$) である。

本業務の調査対象地域の場合は以下の通りである。ハティン省に関しては空中写真は存在しないということであった。他の省についてはほぼ存在する。また新たに空中写真を撮影する場合は、雲のない 6~12 月の間に行う必要があり、一つの県全体をカバーするのに 1:15000 のスケールで約 50000US\$ の費用がかかるということであった。

調査対象地の空中写真存在状況

省・市名	有無	スケール	撮影年次	購入価格 (VND)
ハノイ市	有	1:8000	1993	40000VND/枚
ニンビン省 及びタンホア省	有	1:22000 ~1:30000	1987	40000VND/枚
ハティン省	無	-	-	-
タイグエン省	有	1:30000	1987	40000VND/枚
Thai Nguyen 市	有	1:15000	1995	40000VND/枚





縮尺1:50000 地形図  
インデックスマップ

IV: I  
5630  
III: II

## 地図類

地図類は土地管理局 (Department of Land Administration) が一元的に管理している。地形図類はいずれも単独での入手は困難で、カウンターパート機関において赤いスタンプの押された正式書類を作成してもらった上、直接購入するか、CERWASS に購入を依頼するかして入手可能である。

地形図及び地勢図の場合、存在するものはそのスケール等含めて以下の表の通りである。

スケール	存在する地域	価格
1:500,000	全国	80000VND/枚
1:250,000	全国	50000VND/枚
1:100,000	ハノイ周辺のみ	
1: 50,000	全国	50000VND/枚
1: 10,000	ハノイ市周辺その他 Duc Tho 県 Trung Le など	

図に 1:250,000 と 1:50,000 のスケールの地勢図・地形図のインデックスマップを示す。1:250,000 の地勢図の発行年次は 1967 年、1981 年、1986 年、1990 年であり、土地管理局で依頼しても必ずしも最新のものが購入できるとは限らない。また 1:50,000 の地形図の製作年次は図面に標記されていないがかなり古い。

1:10,000 の地形図については、上記のようにハノイ市周辺など存在すると言う事であったが、入手はかなり難しいと言うことであった。今回の調査対象地の中で存在が確認できたのはタイグエン省 Pho Yen 県 Nam Tien とハティン省 Duc Tho 県 Trung Le で、これらは行政地図として使われていた。

1:250,000 と 1:50,000 のスケールの地形図に関しては、事前調査中に調査対象地の範囲をカバーできるように購入してきた (ただしスケール 1:50,000 のニンビン省の調査対象地域は在庫がなく購入できなかった)。1:500,000 のものは地勢図の他にロードマップがあり、これも対象地域がすべて収まるように購入してきている。

またそれぞれの行政地図がある。省単位のもの各省が B3 サイズに収まるスケールで作られている (80000VND/枚)。各コミューンの行政地図も存在し、スケールは一部例外もあるがほぼ 1:2,000 と 1:5,000 のものが大部分である。また上記の 1:10,000 の地形図を行政地図としている所もある。これらは各省の土地管理局で販売している。地勢図・地形図と同様にカウンターパート機関に正式書類を作成してもらった上で購入可能であるが、オーダーしてから入手するまで 1 週間ほどかかるという事であった。また水開発計画図なども存在するという事であった。

## 水収支計算結果

各地区の水収支計算は現在行っており、1998 年終了時に確定すると言うことであった。従って本格調査団がくる時点でドラフトの入手ができる可能性が高い。

## 水質基準

水質基準は MOH の管轄で飲料用及び生活用水基準がある。またこれは都市地域と農村地域でその項目、基準も若干異なる。これらは一部入手済みである。水質基準は基本的に WHO のものに準じているとい

う事である。従って現在の基準にない項目を対象として試験を行う場合は WHO のものを使うということであった。

Ha Noi 市内には水質試験期間は 2 つあり、それらは以下の通りである。

- 1、労働医科学環境衛生所
- 2、ハノイ市科学環境センター

#### 地質図・水理地質図・地質調査関係データ

地質図、水理地質図は DGMV にすべてそろっている。またこれまで全国あるいは省・市レベルで組織的・系統的に地質調査を行っているのは現在の DGMV あるいは以前の鉱山地質総局およびその下部機関であり、過去のデータを含め、国全体の関連データの入手にはすべて DGMV を通さなければ不可能である。

DGMV は MOI の一機関であり、スタッフ 5,000 人を擁する大組織である。また下部機関として幾つかの地質調査組織などがあり、調査実務を行っている。これらの下部機関は基本的に DGMV の業務を中心に動いているが、それ以外の他省庁あるいは他団体・個人の業務でも委託受注形式で業務を実施している。また DGMV 自身も同様の形で他組織からの業務を委託受注形式で実施している。

地質図、水理地質図はカウンターパート機関に正式書類を作成してもらい、DGMV に書類を提出した上で “Institute of Geoinformation” というところで入手できる。

地質図は 1:500,000 の全国地質図があり 1 セットで 165US\$ である。地区別の別売りはしない。またスケール 1:200,000 地質図も一部作られており、1 枚 10\$ で販売している。スケール 1:200,000 地質図は今回調査対象地区ではタイグエン省を除きほぼそろっていた。このほかに僅かだが 1:150,000 地質図、また 1:50,000 の地質図も一部作られている。事前調査の段階で 1:500,000 の全国地質図 1 セットおよび 1:200,000 地質図もタイグエン省を除き 4 枚入手した。

水理地質図も同様に 1:500,000 の全国水理地質図があり、1 セットで 140US\$ で販売している。1:100,000 のものも作られていると言う事であったが情報は未確認である。

このほかに Geotechnical Map など作られている。また気象水文データなどは MOI に存在すると言うことであった。航空写真・衛星画像も MOI で入手可能と言うことであった。

地質調査関係データ、例えばこれまでに行われた電探調査、試掘調査などのデータは DGMV の下部機関からの報告書類という形で存在するということであった。ベトナムには国家 68 号規定というものがあり、このような報告書類や試掘などの資料のコピー販売はできないということになっている。従ってこのような報告書類や試掘データなどを入手する場合は DGMV と正式に委託契約を結んだ上で、地方の下部機関まで技術者が赴き、打ち合わせなどを行って色々と便宜をはかってもらう他ない。

以下に日本の MMAJ (金属探査事業団) の業務で日本の請負業者が結んだ契約例の主な単価を示す。契約時期は 1997 年 12 月である。

- |  |                          |
|--|--------------------------|
| 1, Land Cruiser for field trips including fuels and driver | 45 US\$ per day          |
| overtime fee for land cruiser *1                           | 7US\$ per hour per 100km |
| 2, Geologist   | 35 US\$ per day          |
| 3, Interpreter   | 35 US\$ per day          |

4, English Speaking Geologist	45 US\$ per day
5, Translation and typing from Vietnamese to English	70 US\$ per page
6, Gathering and compiling information required by -----	*2
7, Expenses required for any other services conducted in accordance with requested by -----	*2

\*1 Applicable in case occupied more than eight hours per day

\*2 (a) Quotation furnished by GSV (Geological Survey of Vietnam) to ----- carries out the service

(b) In case, after GSV started carrying out the service, GSV finds out that the actual amount of the service fees and expenses will exceed the quotation. GSV shall immediately advise ----- of such excess service, GSV shall proceed with carrying out further service only after written approval of ----- on the excess amount is contained.

今回調査対象地周辺各地で行われている試掘は揚水試験を実施後、すぐ埋め戻している為、掘削地点は現地で確認できないが、位置図が存在する。Ha Noi Urban Area では Detail Exploration about Groundwater が行われており、1:50,000 のスケールで取りまとめられている。ハノイでは地下水位モニタリングが毎週行われており、市内の地下水位分布が作られている。

## 8. 面会者リスト

### 計画投資省 (Ministry of Planning and Investment)

- ・ Ms. Truong Thi NGOC LAN : Deputy General Director of Infrastructure Department .
- ・ Mr. Nguyen Khac THANH : Expert ; Dept. Agriculture And Rural Development.
- ・ Mr. Nguyen Xuan TIEN : Expert ; Dept. Foreign Economic Relations.
- ・ Mr. Nguyen Trong TIN : Deputy General Director of Infrastructure Department.
- ・ Ms. Le Tu Oanh : Expert, Infrastructure Cooperation.

### 農業農村開発省 (Ministry Of Agriculture And Rural Development)

- ・ Dr. Nguyen Quang HA : Deputy Minister.
- ・ Dr. Nguyen Ich CHUONG : Deputy Director; Department of International Cooperation.
- ・ Ms. Dao Thi LOC : Senior officer International Cooperation Dep.
- ・ Dang Dinh PHUC : Chief of Bureau for Management of Groundwater Resouces.
- ・ 岩井 孝道 JICA 専門家

### 農業農村開発省第一地下水開拓会社 (Ministry of Agriculture and Rural Development , Underground Water Exploitation Copany No1.)

- ・ Eng. Nguyen Van LAP; Director

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- ・ Dr. Le Van DE : Deputy Director ; International Cooperation Division.
- ・ Dr. Prof. Tran Van THI: Vice Director ; Department of Geology & Minerals of Viet nam.
- ・ Nguyen Nhu THINH : Director ; Secretariat.
- ・ Nguyen Duc DAI : Vice Director: Department of Geological Investigation .
- ・ Nguyen Van DAN : Vice Director of factory ; Northern Hydro-Geology Division.
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- ・ Eng. Nguyen Quang HUY ; Director; Enterprise of geophysical prospecting and exploitation.

N I A P (National Institute For Agricultural Planning & Projection, Remote Sensing & Informatics Center)

- ・ Mr. Nguyen Nguyen HAN :Director.

医療省

- ・ Hoang Dinh HOI; Director; Dept. of Preventive Medicine.

地方給水・衛生環境センター(Centre for Rural Water Supply and Environmental Sanitation)

- ・ Mr. Le Van CAN : Director .
- ・ Mr. Pham Duc NAM : Vice Director.
- ・ Ms. Ha Thanh HANG : ? Chief; Department of Plan and Investment
- ・ Mr. Le Thieu SON: Head of Technical and Capital Construction Department
- ・ Mr. Nguyen Thanh LUAN:(Eng.) Deputy Director
- ・ Ms. Hoang Binh MINH : dia chat thuy van
- ・ Mr. Dinh The HUNG : Environment

ハノイ市

ハノイ市地方給水・衛生環境センター(Centre for Rural Water Supply and Environmental Sanitation)

- ・ Mr. Nguyen Van THINH : Director
- ・ Mr. Nguyen Anh THANG : Vice Director

ハノイ市人民委員会

- ・ Nguyen Ton TAO(Master in Economic) :Director ; Hanoi Agricultural and Rural Development.
- ・ Eng. Dinh Huy MONG : Vice Director ; Hanoi Agricultural and Rural Development Department.

ハノイ市トゥーリエム県人民委員会(People's Committee of Tu Liem District)

- ・ Ms. Nguyen Thi MINH YEN: Vice Chairman.
- ・ Ms. Do Thi VINH : Director of Economic and Rural Development Department.

トゥーリエム県ドンガク社人民委員会(People's Committee of Dong Ngac Commune)

- ・ Mr. Pham Van QUY : Chairman.

トゥーリエム県スアンディン社人民委員会(People's Committee of Xuan Dinh

Commune)

- ・ Mr. Nguyen Van CUONG : Chairman.

#### タイグエン省

タイグエン省地方給水・衛生環境センター(Centre for Rural Water Supply and Environmental Sanitation)

- ・ Mr. Hoang Cuong QUOC : Director .
- ・ Ngo Quang TINH: Vice Director.

タイグエン省人民委員会(People's Committee of Thai Nguyen Province)

- ・ Mr. Nguyen AN: Vice Chairman .

タイグエン省フォーイエン県人民委員会(People's Committee of Pho Yen District)

- ・ Mr. Ngo Xuan TRIEU : Chairman.
- ・ Mr. Nguyen Van THIEP : Vice Chairman.

ドンヒー県人民委員会(People's Committee of Dong Hy District)

- ・ Mr. Dam The DU : Vice Chairman.

ドンヒー県ドンバム社人民委員会(People's Committee of Dong Bam Commune)

- ・ Ms. Nguyen Thi THANH : Chairman.

ドンヒー県ホアチュオン社人民委員会(People's Committee of Hoa Thuong Commune)

- ・ Mr. Nguyen Van HAI : Chairman.

タイグエン市人民委員会(People's Committee of Thai Nguyen Town)

- ・ Mr. Nguyen Huy THAI : Chairman.

#### ニンビン省

ニンビン省地方給水・衛生環境センター(Centre for Rural Water Supply and Environmental Sanitation)

- ・ Vu Duoc TOAN: Director
- ・ Hoang Van SUONG: Vice Director
- ・ Le Quyet THANG: Vice Director

ニンビン省人民委員会(People's Committee of Thai Nguyen Province)

- ・ Mr. Pham Nhu XUYEN : Vice Chairman.
- ・ Mr. Lam Xuan VI: Vice Director ; Ninh Binh Agricultural and Rural Development Department.

- ・ Mr. DUYEN : Ninh Binh Planning and Investment Department.

タムディエップ市人民委員会(People's Committee of Tam Diep Town)

- ・ Mr. Pham Van BANG: Vice Chairman.

タムディエップ市クアンソン社人民委員会(People's Committee of Quang Son Commune)

- ・ Nguyen Van BA: Chairman.

ニョークアン県人民委員会(People's Committee of Nho Quan District)

・ Mr. Nguyen Quang VAN; Vice Chairman.

ニョークアン県ドンフォン社人民委員会(People's Committee of Dong Phong Commune)

・ Buy Huy PHUONG ; Chairman.

イエンモ県人民委員会(People's Committee of Yen Mo District)

・ Mr. Tran Van THONG; Vice Chairman.

#### タインホア省

タインホア省地方給水・衛生環境センター(Centre for Rural Water Supply and Enviromental Sanitation of Thanh Hoa Province).

・ Nguyen Van CUONG ; Director.

タインホア省人民委員会(People's Committee of Thanh Hoa Province)

・ Nguyen Van THAT; Vice Chairman.

ノンコン県人民委員会(People's Committee of Nong Cong District)

・ Hoang Nhu DUC; Director ; Construction Room.

ノンコン県ヴァンタン社人民委員会(People's Committee of Van Thang Commune)

・ Le Thanh QUYNH; Chairman.

ティエウホア県人民委員会(People's Committee of Thieu Hoa District)

・ Nguyen Van THANH; Vice Chairman.

ティエウホア県ティエウフン社人民委員会(People's Committee of Thieu Hung Commune).

・ Hoang Huu HIEU; Chairman.

ティエウホア県ティエウソ社人民委員会(People's Committee of Thieu Do Commune).

・ Hoang Huu THANH; Chairman.

イエンジン県人民委員会(People's Committee of Yen Dinh District)

・ Le Trung KHIEM ; Vice Chairman.

ヴィンロック県人民委員会(People's Committee of Vinh Loc District).

・ Pham Ngoc VY; Chairman.

ヴィンロック県ヴィンロック市人民委員会(People's Committee of Vinh Loc town)

・ Nguyen Dinh Tam ; Chairman.

ヴィンロック県ヴィンタイン社人民委員会(People's Committee of Vinh Thanh Commune)

・ Le Huu Ngoc ; Chairman.

#### ハティン省

ハティン省地方給水・衛生環境センター(Centre for Rural Water Supply and Enviromental Sanitation of Ha Tinh Province).

・ Tran Thanh CHAT ; Director.

・ Dang Toan KHIEM ; Head of Technology Section..

ハティン省人民委員会(People's Committee of Ha Tinh Province)

- ・ Nguyen Hoang TRACH ; Vice Chairman.
- ・ Dao Van TINH ; Director : Department of Agriculture and Rural Development of Ha Tinh Province.

ドゥックト県人民委員会(People's Committee of Duc Tho District)

- ・ Nguyen Van SONG; Vice Chairman.

ドゥックト県ドゥックイエン社人民委員会(People's Committee of Duc Yen Commune)

- ・ Nguyen The CUONG; Chairman.

ドゥックト県イエンホ社人民委員会(People's Committee of Yen Ho Commune)

- ・ Dao Kim HUONG ; Chairman.

ドゥックト県チュンレ社人民委員会(People's Committee of Trung Le Commune)

- ・ Pham Van DUONG ; Chairman.

ユニセフ

- ・ Waldemar Pickardt ; Project Officer.

在ヴェトナム大使館

- ・ 池田 直太 一等書記官

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- ・ 等々力 勝 所長
- ・ 辻野 博司 所員

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- ・ Eng. KABASAWA Akio; JICA Expert.
- ・ Eng. HONDA Yasukazu ; JICA Expert.











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