Vietnam

"Rehabilitation Loan"

Project Summary

Borrower:	Government of Vietnam, the Socialist Republic of Vietnam
Executing Agency:	State Planning Committee (currently Ministry of Planning and Investment: MPI)
Exchange of Notes:	January 1994
Date of Loan Agreement:	January 1994
Final Disbursement Date:	February 1997
Loan Amount:	¥2,500 million
Loan Amount Disbursed:	¥2,479 million
Procurement Conditions:	General Untied
Loan Conditions:	Interest rate: 1.0%, Repayment period: 30 years (10 years for grace period)

《Reference》

(1) Currency: Dong

(2) Exchange Rate:(annual average rate)

Year		1991	1992	1993	1994	1995	1996	1997	1998
Rate	Local currency/US$	11,000	12,000	10,640	10,978	11,037	11,070	11,651	12,998
	Yen/US$	134.7	126.7	111.2	102.2	94.1	108.8	121.0	130.9
	Local currency/yen	81.7	94.7	95.7	107.4	117.3	101.7	96.3	99.3
CPI (1993 = 100)		N.A	N.A	100	114	129	135	140	152

Source: ADB, IFS, State Bank of Vietnam (Central Bank)

(3) Rate at the time of appraisal: 1US$ = 10,640 Dong = ¥95.7 (1993)

(4) Fiscal Year: January ~ December

(5) Abbreviations:

SPC: State Planning Committee

SCCI: State Committee of Cooperation and Investment

CIEM: Central Institute of Economic Management

MPI: Ministry of Planning and Investment

PMU: Project Management Unit

DPI: Department of Planning and Investment

(6) Vietnam's regional administration systems and organizations[1]

Vietnam's units of regional administration are arranged on three levels: provinces, districts and communes. At each level there is People's Council, which is a legislative body, and People's Committee, which is the administrative agency. At the provincial level, which is the largest regional administrative unit, there are four municipalities (the capital Hanoi, Haiphong, Da Nang and Ho Chi Minh City) and 57 provinces.

The following points should be noted when examining Vietnam's systems and organizations of regional administration and its inter-regional relationships.

[1] The observations in this section are based on "Regional Administrative Organizations" by Keisuke Nomoto of "Vietnam's State Structures" edited by Masaya Shiraishi (Akashi Shoten, published in May 2000).

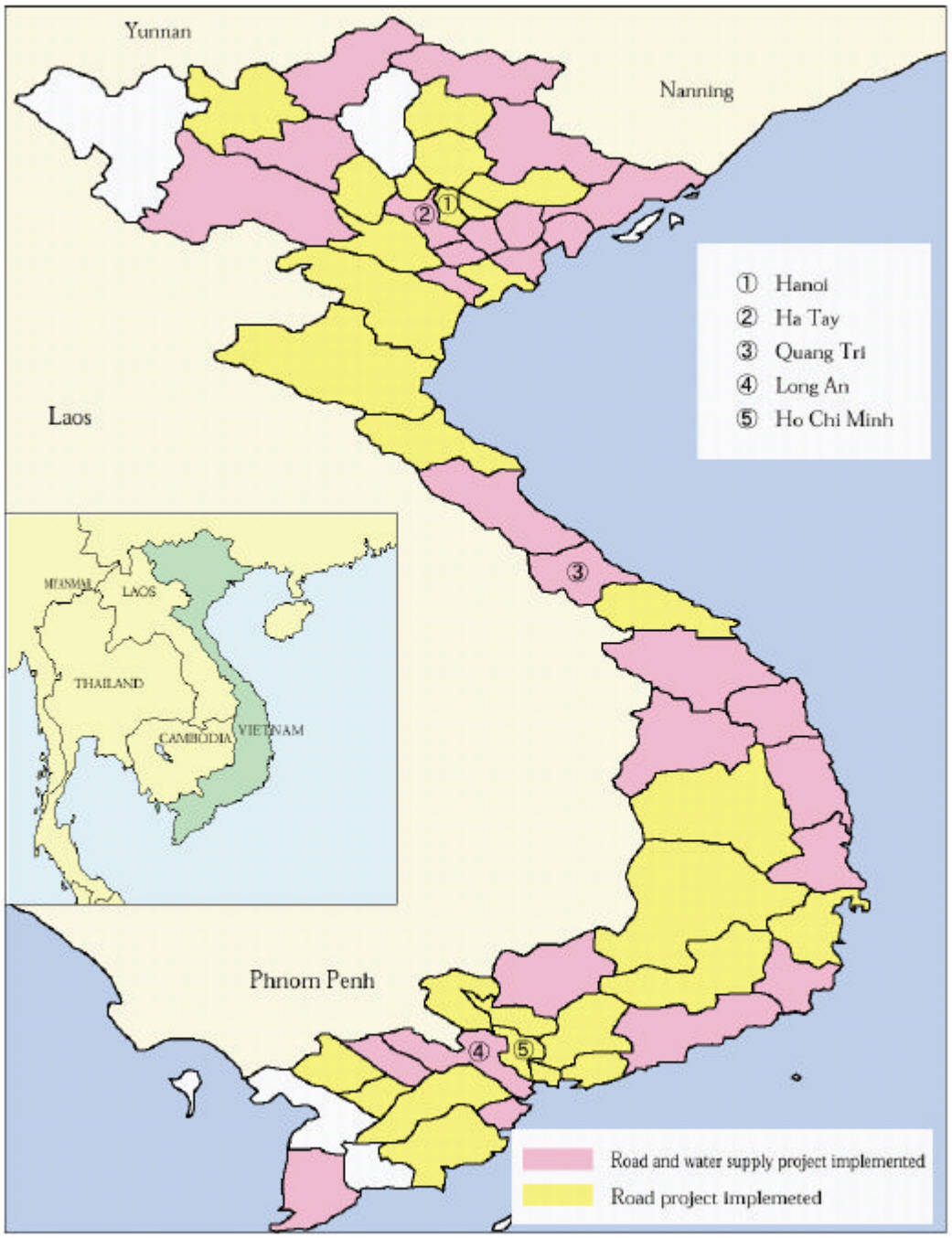
Firstly, at both the national and regional levels Vietnam follows a democratically centralized system, in which all power is vested in the people, and the People's Councils which comprise the people's representatives have a more authoritative position than the People's Committees.

Secondly, there are no established systems, or even concepts, of regional government. People's Councils and People's Committees at the regional level are regarded as "State organs in the regions".

Thirdly, regional administration is the responsibility of People's Committees which comprise only a few members, but they are backed up by the Department of Planning and Investment, Department of Industry, Department of Construction and others as "specialist agencies". These specialist agencies are responsible to the People's Committees on their own levels, and to the equivalent organization on the higher level of the hierarchy. For example, the Ho Chi Minh City Department of Planning and Investment is responsible to the Ho Chi Minh City People's Committee and to the Ministry of Planning and Investment, which is a central government agency. This dual command arrangement becomes extremely complex.

1. Project Summary and Comparison of Original Plan and Actual

1.1 Project Location



1.2 Project Summary and ODA Loan Portion

This loan was made to alleviate the economic difficulties faced by Vietnam in its transition to a market economy, and particularly to promote the country's "Rehabilitation Program" (referred to below as "the original program") for underdeveloped rural roads and water supply (see "1.3.3 Summary of the Original Program").

The JBIC loan covered the foreign currency portion of the cost of importing equipment and materials for road and water supply construction projects, and the entire cost of consulting services. The specific types of equipment and materials to be imported using the JBIC loan were to be determined after the loan agreement was completed, subject to JBIC approval (see "1.3.4 Summary of the Main Program and JBIC Loan Coverage").

The loan took the form of a commodity loan, with the loaned funds being placed in a special account and used to meet funding requirements as procurement progressed. This method differed from the previous conventional form of commodity loan, which used quick disbursement for international balance of payments support. The real objective of the loan was to provide the necessary financial support for the implementation of road and water supply projects. Therefore, this evaluation will focus on the sub-project selection process and the state of maintenance management.

1.3 Background (at the time of appraisal in 1993)

1. Overview of Vietnam's economy at that time

(1) Economic growth

Since the adoption of the Doi Moi policy in 1986, the Vietnamese economy has achieved a rapid growth rate of 8.0% per year due to great expansion in agricultural production and growth in service industries. In 1991 the growth rate in GDP dipped to around 5~6% due to the collapse of the former Soviet Union and other factors before rebounding to 8.3% in 1992. This recovery was largely due to the rapid 12.6% growth of industry (particularly heavy industry) and the recovery of the growth rate in agriculture to 6.3% (with particular growth in rice production).

Thus the benefits of Doi Moi can be seen in the expansion of agricultural production, the decline of inflation, the growth of exports and other aspects. On the other hand, the unreadiness of legal and other systems, infrastructure under-development and the shortage of foreign currency earnings imposed restrictions that threatened to impede future economic growth, and improvements in those areas were needed.

(2) Prices and exchange

Inflation exceeded 300% per year between 1986 and 1988, spurred by currency printing to cover a budget deficit and by the chronic shortage of goods. However, the subsequent reduction of subsidies

and other financial austerity policies and increasing production, which began in the agricultural sector, put inflation into decline. In 1989 the inflation rate subsided to 34.7%, although it rose back to around to 67% in 1990 and 1991 before dropping to 17.5% in 1992.

There was an extreme divergence between the official exchange rate and the parallel market rate, but the Dong was devalued sharply in November 1998. The divergence was largely eliminated and the exchange rate in 1989 was 4,300 Dong to the Dollar. By May 1992 the Dong had fallen to 11,000 to the Dollar.

(3) Fiscal policy

The fiscal deficit has been greatly improved, but at 7% of GDP under the 1993 budget, it was still very high by international standards. Subsidies were abolished in principle in 1989 to reduce expenditures, numbers of civil servants and military personnel were cut back and development expenditures were restricted. On the revenue side, income from crude oil increased, but there was little success in collecting taxes from the private sector, which was then becoming more vigorous.

The fiscal deficit in 1991 was much smaller than in previous years because expenditure had been cut to 16.3% of GDP from 22.8% in 1990. As a result, capital expenditure fell to 3.1% and it was no longer possible to spend adequately on infrastructure.

It was very important to boost revenue by strengthening tax collection ability and making effective use of foreign aid, because the revenue was needed to achieve an adequate level of infrastructure spending, bearing in mind the under-developed state of the country's infrastructure.

(4) International balance of payments and external debt

In the past, the current account was in deficit due to excessive imports from COMECON countries and interest payments on external debt. At the time of the appraisal, the trade balance was improving due to steadily growing exports of oil and rice, and the trade deficit was dwindling towards disappearance. However, the immaturity of Vietnam's domestic production meant that it was dependent on imports of a wide range of goods such as fertilizers and petrochemicals, for which it had previously relied on imports at preferential prices from COMECON countries. As a result, the country was unable to escape from its basic tendency towards deficit.

The balance of external debt in 1992 stood at US$3.8 billion in convertible currency alone[2], of which US$1.6 billion was in arrears. It was an enormous sum, equal to around 66% of the value of imports. In view of this situation, the Paris Club agreed in December 1993 to reschedule around US$790 million , equal to the amount of the country's public debt that was in arrears.

[2] In addition, Vietnam's external debts to the former Soviet Union and Eastern European countries stood at 10.9 billion Rubles.

2. Necessity of this loan

For Vietnam to achieve stable and sustainable economic growth of 7~8%, the Doi Moi policy then being pursued in Vietnam had to be stepped up, with a swift transition to a market economy. To that end it was essential to move forward with improvements to the under-developed infrastructure that was the greatest impediment to the country's economic growth, and to use foreign aid and other resources to alleviate the difficulties involved in the transition to a market economy, such as the international balance of payments.

This loan aimed to ease the balance of payments and assist the Vietnamese government's original program for urgent improvements to rural roads and water supply, which were extremely underdeveloped. These improvements were intended to lay the foundations for a better standard of living for rural people and increased industrial growth.

This loan was used to draw up and execute detailed-designed program (main program) for sub-projects in each province, based on the original program.

3. Summary of the original program

(1) Rehabilitation Program on Provincial Road Network (referred to below as the "Road rehabilitation program")

Vietnam has a total of 94,204km of provincial roads, of which only 6,091km (6.5%) are paved. The extremely low paving rate impedes the flows of people and goods, which are essential for economic progress. The original program called for the paving of 800km of previously unpaved roads (including the rehabilitation of 500m of bridges).

(2) Rehabilitation Program on Water Supply in Small Towns and Villages (referred to below as "Water supply rehabilitation program")

Of the approximately 500 cities and towns in Vietnam, only around 100 have water supply facilities, and the water leakage rate for those stood at around 40% due to dilapidation.

The original program called for the following:

a) Rehabilitation of dilapidated water supply facilities in 28 rural towns nationwide.
b) The construction of water treatment plants in 10 rural towns nationwide.

4. Summary of the main program and JBIC loan coverage

(1) Road rehabilitation program

The main program called for the paving of approximately 1,000km of unpaved roads. The rehabilitation of bridges was excluded from the main program following consideration of economy

and urgency under tight budgetary restrictions.

(2) Water supply rehabilitation program

The main program called for the following:

a) Rehabilitation of dilapidated water supply facilities in 40 rural towns nationwide.
b) The construction of water treatment plant in one rural town.

In addition to the consulting services, the JBIC loan was to cover the foreign currency portion of the imports costs of fuel (gasoline) and asphalt for the road improvements, and pipes and pumps for the water supply improvements.

5. The relationship between the original program and the main program

The original program described above was used as the outline and, after the loan agreement was signed, the consultants who had been hired worked together with the Ministry of Planning and Investment (MPI), which was the executing agency, to decide the designs, the specifications, the costs and other aspects of individual projects (referred to below as "sub-projects") in every province.

Therefore, in the analysis which follows, the main program, which is the overall program once the content of each sub-project had been determined, shall be "the program" for this loan and the overall project implemented under the main program shall be referred to as "the project".

1.4 History

1993	May	Submission of a list of ODA loan petitions for 1993, including this loan by the Vietnamese government.
	June	Visit to Vietnam by Japanese government
	August	Visit to Vietnam by JBIC Appraisal Mission
	November	Prior notification to the Vietnamese government of its provision of ODA loans for 1993 at the conference of donor nations to Vietnam in Paris by the Japanese government (the loan amounts to ¥2,500 million out of ¥52,304 million in total)
	December	Consultation on Vietnam's debt problem by Paris Club.
1994	January	Exchange of Notes
	January	Loan Agreement signing
1997	February	Final Disbursement

1.5 Comparison of Original Plan and Actual of the Project

(1) Project Scope

[1] Road rehabilitation program

Region		No.of provinces	Provinces covered	Plan		Actual		Difference	
Broad classification	Sub-classification			No. of sub-projects	Length of road covered (km)	No. of sub-projects	Length of road covered (km)	No. of sub-projects	Length of road covered (km)
Northern mountain region	Northern mountains	13	11	57	281	56	270	△1	△11
Northern delta region	Red River delta	7	7	53	256	54	280	1	24
Central region	Northern central coastline	6	6	25	112	22	93	△3	△19
	Southern central coastline	7	7	28	94	25	81	△3	△13
	Central highlands	4	4	8	28	8	27	±0	△1
Southern region	Northeast of southern region	5	5	25	68	22	63	△3	△5
	Mekong delta	11	10	25	145	24	135	△1	△10
Total		53	50	221	984	211	949	△10	△35

(Source) JBIC materials

(Note) Numbers of provinces are correct at the time of the consultant's survey (1995) when the total number of provinces was 53. By now some provinces have been subdivided, bringing the total number to 61. With the current number of provinces, the number covered by the project would be 57.

[2] Water supply rehabilitation program

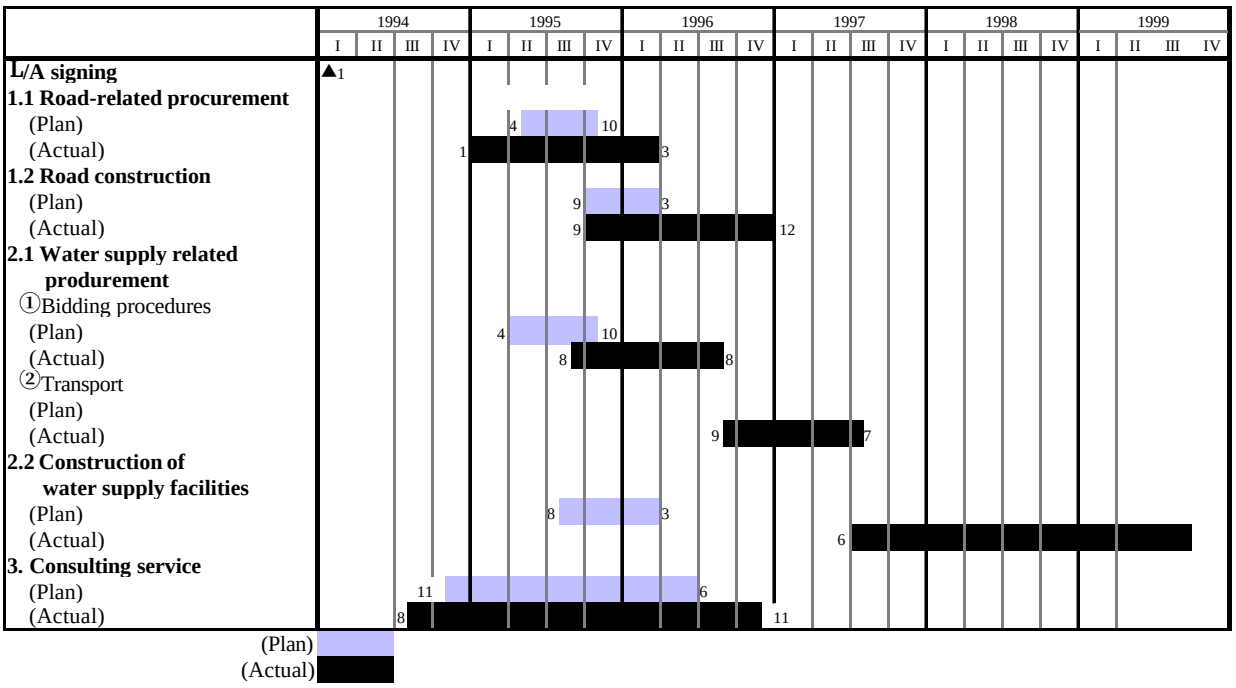
Region		Plan		Actual		Difference	
Broad classification	Sub-classification	No. of provinces	No. of cities	No. of provinces	No. of cities	No. of provinces	No. of cities
Northern mountain region	Northern mountains	8	10	8	9	—	△1
Northern delta region	Red River delta	6	9	6	8	—	△1
Central region	Northern central coastline	2	2	2	2	—	—
	Southern central coastline	7	8	7	7	—	△1
	Central highlands	2	2	2	1	—	△1
Southern region	Northeast of southern region	2	2	2	1	—	△1
	Mekong delta	7	7	7	4	—	△3
Total		34	40	34	32	±0	△8

(Source) JBIC materials

(Note) Numbers of provinces are correct at the time of the consultant's survey (1995) when the total number of provinces was 53. By now 6 provinces have been subdivided out of 34 provinces covered by the project . With the current number of provinces, the number covered by the project would be 34.

(2) Implementation Schedule

	Plan	Actual
1.1 Road-related procurement		
①Fuel		
• Bidding procedures～transport	Apr. 1995 ～ Oct. 1995	Jan. 1995 ～ Dec. 1995
②Asphalt		
• Bidding procedures～transport	Apr. 1995 ～ Oct. 1995	Jan. 1995 ～ Mar. 1996
1.2 Road construction	Sep. 1995 ～ Mar. 1996	Sep. 1995 ～ Dec. 1996
2.1 Water supply related procurement		
①Bidding procedures	Apr. 1995 ～ Oct. 1995	Aug. 1995 ～ Aug 1996
②Transport	N.A	Sep. 1996 ～ Jul. 1997
2.2 Construction of water supply facilities	Aug. 1995 ～ Mar. 1996	Jun. 1997 ～ (completed in 30 provinces)
3. Consulting Service	Nov. 1994 ～ Jun. 1996	Aug. 1994 ～ Nov. 1996



(Source) JBIC materials and executing agency materials.

(3) Project Cost and JBIC loan amount

(Units: Millions of Yen. Figures in ( ) are shares of total project cost provided by the JBIC loan)

Items	Plan		Actual		Difference	
	Total project cost	JBIC loan amount	Total project cost	JBIC loan amount	Total project cost	JBIC loan amount
• Road improvement cost	6,846	1,105 (16%)	8,475	1,266 (15%)	＋1,629	＋161
• Water supply improvement cost	1,589	1,117 (70%)	N.A (Note1)	1,024 (N.A)	N.A	△93
• Consulting service	200	200 (100%)	189	189 (100%)	△11	△11
Total	8,635	2,500 (29%)	N.A	2,479 (N.A)	N.A	△21

[Exchange Rate] At the time of planning (end of 1994) : ¥1 = 110.8 Dong
Actual (average at the time of disbursement) : ¥1 = 84.7 Dong

(Source) Executing agency and JBIC materials.

(Note 1) The total cost of water supply improvements has yet to be determined because some projects have not been completed.

2. Analysis and Evaluation

2.1 Evaluation on Project Implementation

2.1.1 Project Scope

After the loan agreement was signed, the MPI narrowed down the range of sub-projects and confirmed the project scope based on the original program. As a result, bridge construction was exempted from the project scope and changes were made in matters such as the number of cities to be provided with water supply. Further changes were made later, such as removing eight of the 40 cities scheduled for water supply improvement from the project scope.

The changes in the project scope were made to keep the project within its original budget. Considering the fact that a considerable proportion of the project cost was borne by the Vietnamese government, the changes appear to have been an unavoidable measure. However, to enhance the efficacy of the road-building elements of this project, the JBIC should follow up on the bridge-building situation.

1 Points common to the roads improvements and water supply improvements.
Ability of provincial governments to bear costs from their own fiscal resources.

2-1 Selection of criteria for road improvements
[1] Order of priority within the provincial government.
[2] Linkage with national routes and locations of provincial cities.
[3] Completion of land acquisition for construciton, or ease of such acquisition.
[4] Consideration for minority peoples.
[5] Development potential for agricultural, tourism etc.

2-2 Selection criteria for water supply improvements
[1] Geographical conditions (priority for provincial cities).
[2] Post-rehabilitation water supply diffusion rate.
[3] Water loss rate.
[4] Rate of population increase etc.

In addition to the above factors, the selection of sub-projects was further narrowed down with reference to the Standard of Living Survey conducted in 1992 by the General Statistical Office of the State Planning Committee with assistance from the UNDP.

2.1.2 Implementation Schedule

The road improvements were completed nine months behind schedule. This delay was due to the time consumed at the tendering stage in reaching an agreement between the orderer and the supplier over the quality of the asphalt, and due to an overrun in the length of the actual construction period.

Considering the fact that this was the first loan to Vietnam after the resumption of Japanese ODA loans to the country, and the Vietnamese side took a very long time to complete unfamiliar procurement procedures, the timing appears to have been reasonable.

The laying of water supply is far behind schedule, and some sub-projects have not yet been completed in some provinces (as of July 1999). This major delay was caused by the 22 months which were consumed in the detailed investigation of water supply works and the contract agreements for equipment procurement. The delay appears to have been unavoidable because rehabilitation of water supply requires more detailed investigation than new construction, and because there were more than 30 sub-projects. However there is clearly room for improvement in the areas described below.

The MPI is currently the evaluator of tenders, but it cannot enter into direct import contracts[3], so WASEENCO[4] became the contractor for the water supply equipment and materials. However, according to WASEENCO (the party responsible for negotiating and signing the contract), the negotiations with the winning bidder concerning details of product specifications and prices were protracted. WASEENCO acknowledges that there was scope for improvement. In particular, during the contract negotiations the draft contract appended to the tender documents was reviewed in its entirety, and a catalog with photographs of the products concerned was demanded. These appear to be problems caused by the fact that tenders are not evaluated by the same party which signs the contract, which was far from being an efficient procurement supervision system. Ideally the tenders should be evaluated by the same agency which will negotiate and sign the contract, but at least WASEENCO staff should have contributed to the process as the party responsible for preparing tender-related documents, including contracts.

2.1.3 Project Cost

Within the portion covered by JBIC, there was a Yen-based cost overrun of approximately 15% in the road improvements, and an underrun of 8% in the water supply improvements, leaving the overall cost largely as planned. The portion paid by the Vietnamese government from its own funds is unclear, because the water supply improvement side of the project has not yet been completed, but the roads improvement side suffered a Yen-based cost overrun of around 26%. However, in Dong terms the cost underran by 4%, so the cost was largely as planned, and the Vietnamese government had no problems making the budget allocations.

The project cost was kept largely within the planned amount by cutting back the project scope after the loan agreement was signed. The original program at the time of the loan agreement did not specify the details of project scope and cost, so it appears to have been unavoidable that the content

[3] In other projects in Vietnam, the executing agency has become the contract signatory. This system is only employed in projects such as this one, where the executing agency is the MPI.

[4] The official name is "Enterprise of Investigation and Design in Water Supply and Sewerage Construction". It is a state-owned enterprise under the jurisdiction of the Ministry of Construction.

of the project was changed somewhat for the main program.

2.1.4 Implementation Scheme [5]

(1) Executing agency (Refer to Figure 3)

At the time of the loan agreement signing (January 1994), the executing agency was the State Planning Committee (SPC), but the SPC was reorganized in 1995, merging with the State Committee of Cooperation and Investment (SCCI) and the Central Institute of Economic Management (CIEM) to become the Ministry of Planning and Investment (MPI) (see the attached Organization Chart for MPI)[6]. The MPI is an overall coordinating agency at the central government level, with central authority over the drafting of development plans and the allocation of development budgets[7].

Within the MPI, the department with the most central role in this project was the Department of Trade and Services. It was central to the project because it is involved with the purchase of imported materials. For the formulation of the specifics of the project, the Department of Trade and Services cooperated with the Department of Infrastructure[8] and the Department of Regional and Territorial Economic[9]. Project Management Unit (PMU) was set up around the three related departments, with the director of the Department of Trade and Services as project manager. The same system has been employed for later loans of the same type, and it succeeds, with a limited staff (around 20~25 people from each department), in executing the project as a whole rather smoothly, while coordinating the related central government agencies and provincial governments.

(Formulation of sub-project proposals)

Before this project was appraised by the JBIC, the MPI had already asked provincial governments

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5 The following points should be considered to gain an understanding of the implementation scheme for this project.
(1) There are no established systems, or even concepts, of regional government. People's Councils and People's Committees at the regional level are regarded as "State organs in the regions".
(2) The departments which actually carry out administration in the regions, such as the Department of Planning and Investment and the Department of Construction are made up of the People's Committees, which are the administrative agencies in the regions. They come under the guidance and supervision of the People's Committee chairman, and also of the equivalent organizations on the next higher level (the Ministry of Planning and Investment, Ministry of Construction and others at the central government level) in a dual structure.
(3) Since the adoption of the Doi Moi policy, regional administrative systems have been undergoing a process of reorganization and revitalization which is still continuing.

6 The number of staff was approximately 600 in 1999.

7 The Ministry of Finance has authority over the government budget as a whole, and it allocates all budgets other than those for development.

8 The Department of Infrastructure draws up plans for public works nationwide, in coordination with the Ministry of Construction and other related ministries and agencies.

9 The Department of Regional and Territorial Economic contributes to the preparation of policies for the development strategies and Five Year Plans for provinces, and has the authority to coordinate the allocation of infrastructure investments between provinces.

to submit lists of candidate sub-projects. The most important work in moving this project forward at the provincial level was done by the Department of Planning and Investment (DPI) of each province's People's Committee. The DPIs are general coordinating departments which play the same role as the MPI, but at the provincial level. They hear requests and petitions from governments at the district level, which is the level below the provinces, and coordinate opinions among the related departments (Departments of Construction, Finance and others at the provincial level) in order to submit written petitions with priority rankings to the MPI[10].

In order to receive approval from the MPI to carry out a project, the province concerned must present at least a basic design and approximate calculation of the project cost, and receive prior approval of the cost and content of the project. Therefore, in many cases, the provinces employ local consultants[11] for this stage at their own expense. However, even if they receive approval for the cost and content of the project, the equipment and materials obtained using funds from this project via the central government's development budget only cover a very small portion of the actual total project cost. Compared to ordinary JBIC projects which pay a certain proportion of the project cost, the burden on provincial governments was extremely large[12].

(Screening by the MPI)

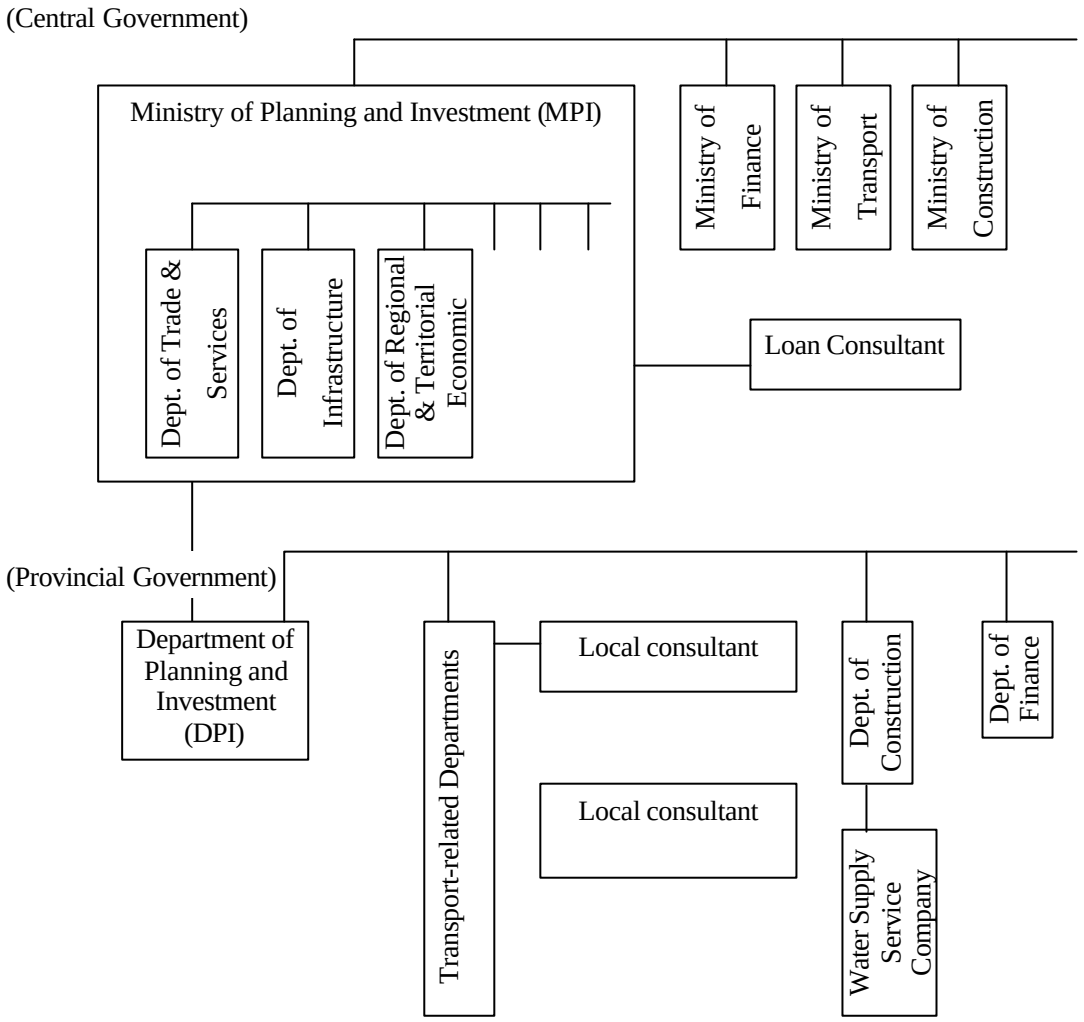
After the loan agreement was signed, the MPI incorporated the value of the loan into the development budget for the next financial year, and proceeded to select the sub-projects for each province and list the items which would have to be procured using the loaned funds. In this process it referred to the lists submitted by the provinces and conferred with related ministries and agencies and the loan consultants.

10 The DPI is an agency of the People's Committee of Province. Strictly, this kind of procedure between the MPI and DPI, involving the request for submission of candidate projects and the submission of such projects, should proceed with the approval of the Provincial People's Committees.

11 The consultant is usually a state-owned enterprise under the authority of the department concerned, but in the field of water supply there are two large water supply and sewerage corporations which handle all stages of such projects from planning to implementation. One is WASEENCO (Enterprise for Investigation and Design in Water Supply and Sewerage Construction) in Hanoi and the other is WASECO (Water Supply and Sewerage Construction) in Ho Chi Minh City. Most provinces use one or other of these corporations as the consultant and contractor for water supply construction.

12 For example, JBIC finance only accounted for less than 15% of the total project cost for road improvements, under both the planned and actual implementation. There are no completed records for the water supply improvements, but at the planning stage the share paid by the provincial governments was to be 70%, which is less than for the roads project but still very high.

Figure 3 Implementation Scheme and Formation of Sub-projects



(Sub-project implementation stage)

Acting on the MPI's selection of sub-projects, the chairmen of the People's Committees for each province appoints the directors of the various departments with jurisdiction over the project concerned as project owners, and the departments form the PMU to run the project.

The PMUs used the equipment and materials allocated to them by the central government, and those they procured from Vietnamese sources with their own funds, to construct their projects using local contractors. The selection of consultants and contractors for the sub-projects was sometimes made through tendering and sometimes through direct appointments.

(2) Consultants

A Japanese consulting company was selected as the consultant by a short-list method. The consultant's TOR included the following:

[1] Review of the original program
[2] Assistance in tendering
[3] Construction supervision
[4] Overseas training of PMU staff

Their performance is said to have been good according to an executing agency, MPI

When the loan agreement was signed, the details of each sub-project had not been determined, and the scope and cost of the project were not settled until after the consultant contract had been signed. As a result, the role of the consultant was much larger and more important than in ordinary JBIC project-type loans. Although there were problems such as delayed pump procurement, we can judge that the project as a whole appears to have been executed smoothly, and there was no significant problem with the performance of the consultant in this project.

(3) Suppliers

One major feature of this project is that procurement of imported equipment and materials was not handled by the provincial-level PMUs but centrally by the PMU at the central government level, which was the MPI. The MPI took sole responsibility for procuring the total amounts of equipment and materials that would be required for all the selected sub-projects.

Suppliers for road-building materials were found through international shopping and those for the water supply materials through international competitive tender with pre-qualification. As mentioned above, the MPI was not qualified at that time to sign contracts for imported equipment and materials. Therefore the contract for asphalt was made with TRACIMEX[13], a state-owned enterprise under the authority of the MPI, the contract for fuel with PETROLIMEX[14] and the contract for water supply materials with WASEENCO, a state-owned enterprise under the authority of the Ministry of Construction.

The procurement of pumps, disinfection equipment, maintenance equipment and water testing instruments for water supply projects ran into problems such as delivery to the wrong places within Japan. Also, equipment manuals were in English only, and no workshops were held for training in equipment installation, so many pumps were broken during installation. The broken pumps were replaced free of charge by the manufacturer (which was not the contractor), a Japanese company, and this solution was followed up by installation workshops held all over the country and partial

[13] The official name is the Transport Import and Export International Cooperation Corp.
[14] The official name is the Vietnam National Petroleum Export- Import Corporation.

translation of English manuals into Vietnamese. Thus while these were reactive measures, efforts were made to remedy the situation and prevent a recurrence. In future, the agencies responsible for procurement of equipment should make sure that the related contracts include measures such as the translation of manuals and workshops to teach installation methods.

No significant problems were reported with the procurement of road-building materials.

2.2 Evaluation on Operations and Maintenance

This project comprised around 250 sub-projects which covered all of the 53 provinces[15] which existed at the time in Vietnam. There were as many operation and maintenance systems and situations as there were sub-projects, which made it impossible to evaluate all sub-projects within the limited survey period available. Therefore this post evaluation selected six sub-projects in three provinces for evaluation as case studies.

The three case study provinces were selected according to criteria as described below.

[1] One province each in Vietnam's northern, central and southern regions were selected.
[2] The selected provinces had at least one road improvement project and one water supply improvement project.
[3] In order to conduct an efficient survey in limited time, provinces with relatively good transportation were chosen.
[4] Provinces with at least one well-executed sub-project and at least one that encountered some kind of problem were chosen[16].

In line with the above criteria, the following three provinces were chosen to be surveyed.

[1] Ha Tay Province (northern, near Hanoi).
[2] Quang Tri Province (central, near Da Nang).
[3] Long An Province (southern, near Ho Chi Minh City).

2.2.1 Operations and Maintenance Scheme

(1) Operations and maintenance scheme for road sub-projects

Roads at the provincial level are under the authority of transport-related departments of People's Committees, and they are managed by offices specializing in road management.

[15] This is the number of provinces at the time of the consultant's survey (1995). There are now 61.

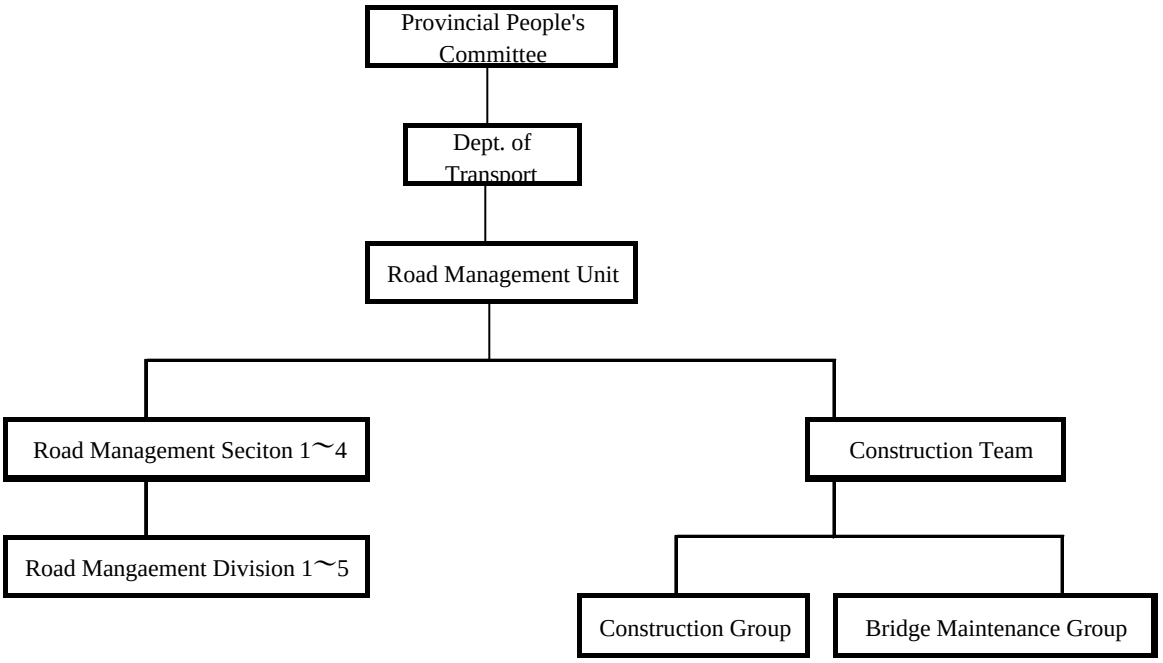
[16] The reports from the executing agency, the MPI, were not necessarily adequate, so this was judged from various reports concerning this project and discussions with JBIC's Hanoi office and other sources.

At the district level, roads were managed by the district People's Committees.

(i) The system of road management departments (organization, staff, posts, ability)

As the organization between the road management departments was largely the same in each province, we will examine the Road Management Unit[17], which is the road management body for Ha Tay Province, as a typical example (see Figure 4).

Figure 4 Organizational Chart for Ha Tay Province Road Management Unit



(Province's executing agency materials)

Road Management Unit in Ha Tay Province consist of managers, engineers, accountants and financial specialists, skilled staff and general laborers. The two units[18] in the province have a total of 300 workers. Each unit consists of four Road Management Sections and one Construction Team. The director of each unit has authority over hiring and firing the unit's staff, and is appointed by the provincial People's Committee. The director's term of office and the frequency of reshuffles are not set, but most directors are selected from engineering backgrounds.

17 The names used vary widely between provinces.

18 The two road management units in Ha Tay Province divide the province between them (northern and southern sections).

Each Road Management Section contains 3~5 Road Management Divisions, with each division being responsible for the rehabilitation and maintenance of 10~20km of roads. Each Construction Team is divided into Construction Group and Bridge Maintenance Group which are responsible for concrete molding, the preparation of traffic signals, tunnel boring and bridge maintenance.

(ii) Maintenance inspection systems

The provinces do not have their own technical manuals. Instead, they follow consistent nationwide guidelines for maintenance laid down by the Vietnam Road Administration, an agency under the Ministry of Transport.

The materials necessary for road maintenance are purchased as required by each maintenance division from within the maintenance budget. Most materials can be obtained in the province concerned or its neighboring provinces.

(iii) Maintenance-related training programs

Engineers are sent for training at universities and other institutions, at seminars held by central government and other agencies, and at training centers run by the provinces. Training of skilled workers is through OJT with annual examinations for personnel evaluation.

(iv) Budget

The road management bodies of each province submit applications to the transport-related divisions of provincial People's Committees for the budget needed for maintenance. After the application is approved by the provincial People's Committee concerned, the funds are allocated. If the province is commissioned by the state to maintain national road routes, it will receive a separate budget allocation for the purpose.

Table 1 shows the amount allocated to each of the provinces for road maintenance[19]. The amount allocated varies between provinces according to the types of roads and their distance from quarries, but in any province around 10% of the roads-related budget will be allocated to maintenance.

[19] This budget includes costs of personnel, building materials, construction and other expenses.

Table 1 Basic Data and Annual Road Maintenance Budgets for Each Province (FY 1999)

Province	Population (Note 1) (1,000 people)	Number of users of the transport sector (Note 2) (1,000 people)	Province's GDP (billion Dong)	Maintenance budget (Dong)
Ha Tay	2,294	7,100	4,646	3 billion
Quang Tri	553	2,000	998	4 billion
Long An	1,285	23,000	3,799	5 billion

(Source) Government of Vietnam (General Statistical Office) and each ministry's executing agency materials

(Note 1) 1996

(Note 2) Figures are totals for road, rail and water transport users. In Vietnam approximately 80% of transport users nationwide are road users (figures 1996).

(Note3) 1 Dong = ¥0.008650
(1 billion Dong = ¥8.65 million, 1 million Dong = Approx. ¥9,000) (July 1999)

(2) Operations and maintenance scheme for water supply sub-project

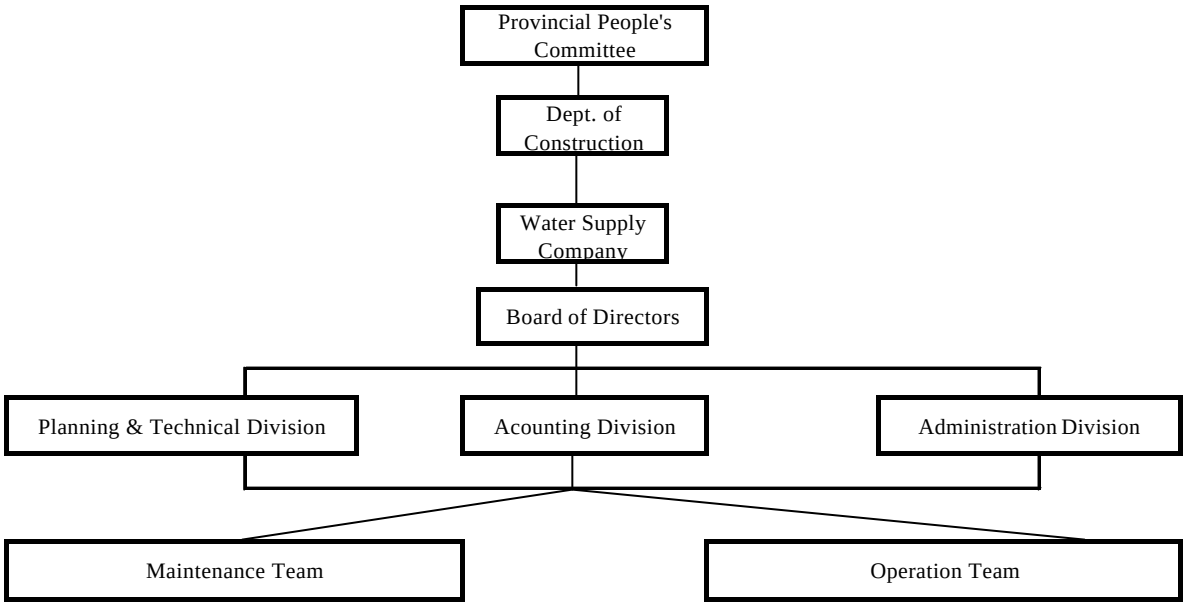
In any province, the maintenance of waterways facilities at the provincia l level is handled by the Water Supply Company under the People's Committee's Department of Construction. Organizationally, each water supply company is a state-owned enterprise under the corresponding People's Committee, but its funds for new investment are provided from the provincial budget, and it has close personnel links with the Department of Construction. Water supply companies are responsible for the operation and maintenance of water supply facilities and the collection of charges, as well as being contracted for some water supply construction.

(i) Maintenance agency scheme (organization, staff, posts, ability)

As the Water Supply Companies of each province have largely the same organization and functions, we will present an overview of the organization and functions of the Tan An Water Supply Company[20] of Long An Province as an example (see Figure 5).

[20] This is the Water Supply Company that serves Tang An, the provincial capital of Long An province.

Figure 5 Organization Chart of Water Supply Company in Lon An Province



(Province's executing agency materials)

The Tang An Water Supply Company of Long An Province consists of management, accounting and finance specialists (two people in total), four engineers, three technicians[21], skilled workers and laborers (drivers etc.). The engineers are university graduates, and they have all passed the technician's examination for the water supply sector specified by the government.

(ii) Maintenance and inspection system

Unlike the roads system, there is no standard nationwide manual and the provinces use differing maintenance methods based on manufacturers' manuals and other resources. Before this project each province made its own arrangements for buying equipment from many different countries[22], so the specifications of pumps and other equipment are very different between provinces.

The Ha Dong Water Supply Company in Ha Tay Province has no special technical manuals, and the technical staff base their maintenance work on their own experience. The Technical Division of

[21] The term "engineer" refers to specialist technical staff qualified to graduate level or beyond, while "technician" refers to general technicians with high-school diplomas.

[22] The three provinces surveyed had previously imported equipment from the former Soviet Union, China, France and Denmark.

Dong Ha Water Supply Company in Quang Tri Province prepares guidelines of their own[23] on maintenance and inspection. The Tan An Water Supply Company in Long An Province uses technical manuals prepared by a local consultant. Each province obtains the materials (machine oil etc.) and spare parts (valves etc.) it needs for operation and maintenance from Vietnamese companies.

Discussions with the MPI, WASEENCO, manufacturers and other related parties revealed that Ha Tay Province was not the only place where the water supply companies were not provided with installation manuals for the pumps procured for this project. We were unable to identify the cause of this problem, but considering the large number of problems that occurred with pump installation, WASEENCO, the procurement executing agency, and the supplier or contractor should make better arrangements in future.

(iii) Maintenance-related training programs

No specific training programs have been arranged, because all engineers are already specialists in the water supply field. However, they may be sent to attend seminars and workshops for 3~5 days, once a year, at the invitation of the Ministry of Construction. Universities in Hanoi and Ho Chi Minh City provide training for managerial staff.

Before skilled workers are hired, they receive training at secondary technical training centers, followed by OJT for further skills, as required.

(iv) Budget

Water supply companies in all provinces cover their operation and maintenance budgets from their own sources of funds, using water charge revenue and other business revenue (contracting water supply construction etc.) (see Table 2).

Table 2 Annual Operation and Maintenance Budgets in Each Water Supply Company

Province	Name of Water Supply Company	Capability of supply facilities (m^3/day) (as of 1998)	Operation and maintenance budget (million Dong)
Ha Tay	Ha Dong	15,000	400
Quang Tri	Dong Ha	15,000	776
Long An	Tan An	15,000	350

(Source) JBIC and each Water Supply Company material
(Note) 1 Dong = ¥0.01060 (100 million Dong = Approx. ¥1.06 million)

[23] The guidelines cover pump operation, chlorine disinfection, the storage of chlorine, and methods for equipment maintenance.

2.2.2 Operations and Maintenance

(1) Operation and maintenance for road sub-projects

JBIC conducted field surveys to ascertain the maintenance status of roads in each province, as described below.

(i) Ha Tay Province

First JBIC inspected provincial road No.430, which only had a single lane before it was improved. The project improved it to a wider dual carriageway with median strip along a length of approximately 3km, and its traffic volume had nearly doubled. However, the one bridge in the stretch of road was not included in the project and had not been improved, leaving it as a major traffic bottleneck. The problems caused by the exclusion of bridges from the scope of this project can also be seen in Long An province (the problems are described in detail in "(iii) Long An Province").

JBIC also examined one road at the district level that was improved under this project. The road was district road No.79 between Lien Trung and Dan Phung. The work of paving this road was completed in 1996, but the road was already seriously damaged, with crumbling shoulders, worn asphalt and depressions (see Photo 1).

In discussions with the People's Committee responsible for the construction and maintenance of the road, we heard that the road was believed to be damaged by the passage of five ton trucks. In 1991, when the Department of Planning and Investment planned this road, it defined it as a rural road which would be traveled by trucks of up to five tons. However, a national project was implemented in the Dan Phung area, where the road is situated, to strengthen the dykes around the Red River, and large earthmoving trucks of 20 tons and over used the road, despite a prohibition from the district.

Photo 1 The road has been damaged by large trucks working on dyke construction

The main cause of the problem was a lack of information sharing between the related agencies in preparing the road construction plan. It is possible that the Department of Construction had received notification in advance of the national project to strengthen the dykes but did not adequately pass on the information to the Department of Transport and the district which were in charge of the road plan.

(ii) Quang Tri Province

The roads in Quang Tri province are maintained through macadamization, because the stone is readily available locally and macadam is a material that local laborers can handle.

Provincial road No.68 was one of the roads improved by this project. It is located on the outskirts of the provincial capital, and the project covered 2.569km of a total road length of 17.4km, which is already complete. Before improvement the road was 3m wide (a single lane), but it has now been widened to 6m (two lanes, no median). JBIC passed along the whole length of the improved section and did not see any damage to the road surface or any other problems which might impede traffic.

(iii) Long An Province

JBIC examined a 15km stretch of road linking Tang An, the capital of Long An Province, with neighboring Chau Thauh district. The road surface was improved under the project. When JBIC inspected the road there were many bicycles and motorcycles on the road, with occasional trucks in the ten ton class.

Before the project there was no truck traffic at all on the road, so the initial plan set the maximum truck weight at eight tons. However, after the project was completed at the end of 1997, larger trucks in the ten ton class began using the road. Furthermore, the soil survey had been inadequate, and it was clear that durability would be a problem if the road was not changed from the initial design. Therefore the road that had just been improved under this project was immediately subjected to additional construction work which reinforced its maximum weight capacity to 30 tons (the provincial government funded the additional construction work). At the time of the field study, the additional construction had only just been completed (in June 1999) and the condition of the road surface was extremely good.

However, the 15km stretch of road that was improved under this project included two extremely dilapidated bridges which appeared hazardous for large trucks to cross (Photos 2 and 3). Both were iron bridges constructed around 40 years ago and were extremely corroded. The road surface of the bridge was made of timbers laid across the frame. These bridges limit the trucks that can use the road to 13 tons, but we saw trucks at the edge of the weight limit crossing the bridges. Remedial action must be taken quickly.

Photos 2 and 3 Dilapidated bridges on roads improved under this project
(a side view of the bridge on the left and a truck crossing the same bridge on the right)

The problems caused by the exclusion of bridges from the projects under this loan were to some extent unavoidable because the loan was a commodity loan to cover the costs of buying the necessary imported equipment and materials, and did not cover the costs of civil works and domestic procurement, and because the Vietnamese side was under a restricted budget. Nevertheless, when sub-projects are selected for subsequent similar sector loans, priority should be assigned to completing the bridges for this project, so that the effects of the portions completed so far can be fully realized.

In later sector loans after this loan, the loans cover most of the project cost, including the local currency portion, and include measures to keep bridge building within the scope of the project.

(2) Maintenance status of water supply sub-projects

(i) Water purification and supply capacity

As Table 3 clearly shows, this project greatly increased the water supply companies' water purification and supply capacity[24]. In future the capacity should be increased still further and combined with efforts to cut the high loss rates, which will be described later.

Table 3 Comparison of Water Purification and Supply Capacity Before and After Project Implementation

Province	Name of Water Supply Company	Water supply population (as of 1995)	Capacity before project implementation	Capacity after project implementation	Increased capacity
Ha Tay	Ha Dong	80,000	10,000	16,000	6,000
Quang Tri	Dong Ha	65,000	4,600	15,000	10,400
Long An	Tan An	108,000	7,000	15,000	8,000

(Source) JBIC and each Water Supply Company materials

(ii) Water quality

Table 4 presents the water quality data for the water supply companies in the case study provinces. The Tan An Water Supply Company of Long An Province put the testing equipment procured under this project into service quickly, and is using it to the full for water quality testing. The Dong Ha Water Supply Company in Quang Tri responded that it conducts water quality tests in line with Ministry of Health standards, but it was impossible to obtain any specific data.

Table 4 Water Quality Data After Project Implementation (as of July 1999)

Province	Name of Water Supply Company	Turbidity (NTU)		pH value		Chlorine ion (mg/l)		Remaining chlorine (mg/l)	
		Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
Ha Tay	Ha Dong	15.0	0.8	5.7	6.7	26.5	27.5	0	0.6
Long An	Tan An	N.A	N.A	6.7	7.2	26.0	28.0	0	0.5
Japanese water quality standards		Less than 2		5.8 ~ 8.6		Less than 200.0		Approx. 1.0	

(Source) Each Water Supply Company's materials

(iii) Loss rates

Around the time this project was implemented, there was some improvement in loss rates, as shown in Table 5. The improvement was due to the laying of new pipes procured for this project, which appears to have caused a considerable reduction in technical losses, such as water loss rates.

[24] As mentioned earlier, the Tan An Water Supply Company in Long An Province bought pumps with its own funds, so the JBIC loan did not make a direct contribution to the increase in its water purification and supply capacity.

Table 5 Comparison of Loss Rates Before and After Project Implementation

Province	Name of Water Supply Company	Loss rates (%)		Difference (%)
		Before project implementation (1995)	After project implementation (1999)	
Ha Tay	Ha Dong	40.0	38.0～42.0	△2.0～2.0
Quang Tri	Dong Ha	35.0	30.0	△5.0
Long An	Tan An	42.0	30.0(Note)	△12.0

(Source) Each Water Supply Company's materials

(Note) Non-technical losses due to non-payment of charges are not included.

Looking at the water supply companies individually, Ha Dong Water Supply Company in Ha Tay Province hardly managed any improvement in its loss rates. This is probably because Ha Tay Province saw hardly any improvement in technical and non-technical losses after the project (non-technical losses due to non-payment of charges account for 10% of all losses at the Ha Dong Water Supply Company). The Ha Dong Water Supply Company should study ways of reducing its losses of all types in future.

Loss rate figures for the Tan An Water Supply Company in Long An Province are very different, but that is because the figures for loss rates after the project include physical loss rates from water loss and theft, but not the rate of losses from non-payment. In discussions it was reported that the level of non-technical losses due to non-payment and other causes was rather low. In fact, homes that JBIC mission visited at random in the course of the field survey were all individually equipped with water meters, and it was our impression that considerable efforts were being made to collect charges (see Photo 4).

Photo 4 Water supply meters installed for each house (Tan An)

(iv) Charges

As Table 6 shows, the levels of water charges are largely the same for each water supply company. The level of charges in 1999 was ¥9~36 per cubic meter.

Table 6 Water Changes Standard in Each Water Supply Company (Unit: Dong/m^3)

Province	Name of Water Supply Company	Water charges		
		Ordinary household	Public agencies, manufacturing industry	Service industry
Ha Tay	Ha Dong	1,500	3,000	3,000
Quang Tri	Dong Ha	1,000	3,000	4,000
Long An	Tan An	1,600	2,600	3,000

(Source) Each Water Supply Company's materials
(Note) 1 Dong = ¥0.008650 (1,000 Dong = Approx. ¥9) (July 1999)

Charges are set at a level adequate to cover maintenance costs and other ordinary expenditures (excluding expenditures on investment). Revisions of water charges are controlled by central government guidelines and must win the final approval of the province's People's Committee. The Tan An Water Supply Company in Long An Province has increased its water charges in recent years because, as mentioned earlier (2.1.2 Implementation Schedule), despite the extreme urgency of this project's water supply rehabilitation project, the arrival of the pumps essential for the project was delayed for a long period, and the company had to go ahead and buy other pumps with its own funds.

The charge collection methods used were the same for all water supply companies. Ordinary households are charged according to the meter attached to their homes, and the charges are collected by collectors belonging to the water supply companies who go from door to door. Businesses and public agencies are issued bills based on their meter readings and pay by bank transfer.

(v) Other

In the course of the field survey, it was found that the equipment procured under the project was not being used in some provinces.

The Tan An Water Supply Company in Long An Province had not installed any of the pumps bought using the JBIC loan. Despite the extreme urgency of this project's water supply rehabilitation project, the arrival of the pumps essential for the project was delayed for a long period, and the Tan An Water Supply Company had to go ahead and buy other pumps with the province's funds. When the decision was taken that Long An Province would buy the necessary pumps with its

own funds, the province and the MPI should have taken steps between them to cancel the other pump procurement.

According to Long An Province, the pumps will be used by the province in another project, but the JBIC and the MPI should continue to monitor the condition of the pumps to make sure they are put to good use at some time in the future.

2.2.3 Financial Situation

The body responsible for the maintenance of roads is incorporated into the provincial government's budget system, so there is no need to analyze its financial position.

All the water supply companies work on the basis of independent profit system (except for investment). Table 7 presents an overview of their income and expenditure.

Table 7 Income and Expenditure Positions of Each Water Supply Company (1998)

(Unit: Dong)

Province	Name of Water Supply Company	Total income (for income of water charges)	Total expenditures (for maintenance cost)	Income and expenditure
Ha Tay	Ha Dong	8.7 billion (6 billion)	7.9 billion (0.4 billion)	0.8 billion
Quang Tri	Dong Ha	5.1 billion (3 billion)	2.9 billion (0.8 billion)	2.2 billion
Long An	Tan An	6.3 billion (N.A)	5.5 billion (0.4 billion)	0.8 billion

(Source) Each Water Supply Company's materials
(Note) 1 Dong = ¥0.008650 (1 billion Dong = ¥8.65 million) (July 1999)

Income mainly consists of payments for charges, with the remainder being project income from contracting water supply works (for schools and government offices etc.). Expenditures consist mainly of business tax and other taxes, and operation and maintenance costs. Expenditures for new investments are allocated by provincial governments.

2.2.4 Environmental Impact

Road improvement problems can lead to air pollution due to increased traffic volume. This project rehabilitated provincial and district roads which had relatively little traffic, and no air pollution problems have been reported to date. There does not appear to be any other pollution or major negative impact on the natural and social environments.

No ground subsidence problems due to the water supply improvements has been reported, and there does not appear to be any pollution or major negative impact on the natural and social environments.

2.3 Evaluation on Project Effects and Impacts

2.3.1 Impact of Road Improvement

1. Overall impact of road improvement

Impact indicators such as traffic volume were only gathered for the provinces visited in the field survey. For overall effects, the qualitative impact of road improvement was gauged through collation of findings of interviews[25] with road users.

(1) Survey method

- Provinces where interviews were held: Four northern provinces, four central provinces and three southern provinces, eleven in total.
- Interviewees: 316 (By gender: 63% male, 37% female. By profession: 24% commercial, 23% agricultural, 15% clerical, 13% civil servants, 4% engineers).
- Questionnaire (multiple choice, Vietnamese-language edition prepared).

(2) Interview findings

Of the interviewees, 66% said that they used the affected road more often after the project than before it. They gave the following reasons (multiple responses were permitted).

[1] A more comfortable journey (28%).
[2] Shorter journey time (23%).
[3] Safer than before (18%).

Besides the multiple choice section, there was a comment section, in which the following comments appeared.

- The road is much more comfortable and the journey takes less time, so we want to see more of this kind of assistance (142 respondents).
- We can transport agricultural produce more easily and efficiently (27 respondents).
- The road should be wider to prevent accidents due to crowding (23 respondents).

There were also two expert opinions asking that macadamized paving be used rather than concrete and asphalt paving.

The above shows that as a result of the project, many users of the roads improved by this project thought that the quality of the roads was higher than before and, as a result, road usage had increased. However, a few respondents said that the road improvement had made the roads more crowded than they had been before, and therefore more dangerous to travel on, and they used the roads covered by this project less frequently as a result.

[25] The interview findings used the results of a survey that was conducted by JBIC in 1998 as part of its post-project monitoring.

2. Impact in the provinces covered by the field survey

(1) Quantitative effects

The road improvements carried out under this project consisted of road widening, addition of lanes and paving of unpaved roads, achieving increased traffic volumes and reduced journey times (see Table 8). On all roads, motorcycles were the most numerous type of vehicle, followed by automobiles and trucks.

Table 8 Changes in Traffic due to the Project Implementation

Province	Road name	Traffic volume (vehicles/day)			Journey time (minutes)		
		Before project implementation	After project implementation	Difference	Before project implementation	After project implementation	Difference
Ha Tay	No. 430	500	1,000	＋500	N.A	N.A	N.A
Quang Tri	No. 66	1,200	1,824	＋624	24	12	△12
Long An	Tan An-Chau Thauh road	N.A	N.A	N.A	25	15	△10

(Source) Each ministry's executing agency
(Note) Traffic volumes do not include motorcycles and bicycles.

(2) Qualitative effects

Although it was impossible to conduct an interview survey of beneficiaries to determine the qualitative impact of the project, the road improvements appear to have generated local economic effects, and concerned parties in provincial People's Committees indicated the same.

Before the roads were improved, they were unpaved with weak shoulders and they were particularly difficult to use in rainy season. After the roads were paved with asphalt they remained passable to some extent even under heavy rain. Therefore the road improvements appear to have made local economic activities easier.

2.3.2 Impact of Water Supply Improvement

1. Overall impact of water supply improvement

Most of the water supply improvements have only just been completed, and there are still some incomplete sub-projects. Therefore the recorded data for impact indices for the project as a whole is scheduled to be presented in a later report. Impact analysis in this report will have to be confined to those provinces which were visited in the field survey.

2. Impact in provinces visited in the field survey

(1) Quantitative effects

- Impact on water supply diffusion

Table 9 presents data for the impact on water supply diffusion rates, which was obtained from the water supply companies.

The comprehensive rehabilitation of water supply facilities, including procurement of pumps and pipes (covered by the JBIC loan) yielded substantial increases in the diffusion rates achieved by the Dong Ha Water Supply Company in Quang Tri Province and Tan An Water Supply Company in Long An Province.

There was no improvement in the water supply diffusion rate for the Ha Dong Water Supply Company in Ha Tay Province, but the quality of the water supply service is reported to be much improved due to better water quality and higher water pressure.

Table 9 Changes of Water Supply Diffusion Rate in Each Water Supply Company (%)

Province	Name of Water Supply Company	Water supply diffusion rate		Difference
		1997	1999	
Ha Tay	Ha Dong	70	70	±0
Quang Tri	Dong Ha	55	75	+20
Long An	Tan An	65	80	+15

(Source) Each Water Supply Company's materials

(2) Qualitative effects

- Public health improvements

One qualitative effect of this project is an improvement of public health due to a reduced incidence of waterborne diseases. All the water supply companies surveyed indicated this as an effect of the project.

In particular, people who did not have water supply service in some areas of Quang Tri Province took their water from uncovered wells. The water from these wells was extremely polluted with soil containing levels of iron and peat, and also with human and animal excreta, leading to high incidences of waterborne diseases such as eye and skin conditions, diarrhea and women's diseases. Statistics for Quang Tri Province in 1994 show 19,858 cases of digestive ailments such as diarrhea and bloody feces (approximately 3.6% of the province's population[26]), 201 cases of cholera (0.04%) and 6,000 cases of skin disease (1.1%). No new statistics have been gathered since the project was completed, but waterborne diseases have been reducing steadily due to the increase in the water supply diffusion rate, and the reduction in these diseases improves public health, and reduces the financial burden of infectious disease countermeasures on provincial governments.

[26] The percentages are based on the provincial population of 544,100 recorded in 1995.