

**"Project Formulation Survey"
under the Governmental Commission
on the Projects for ODA Overseas
Economic Cooperation in FY2012
Summary Report**

Socialist Republic of Viet Nam

**Project Formulation Survey
on Water Environment Improvement
of Dams and Downstream area
in Vietnam**

March 2013

**Marsima Aqua System Corp.
Nikken Sekkei Civil Engineering Ltd
Joint Venture**

This report is a summary of a project formulation survey conducted by the contractor, under the Governmental Commission on the Project for ODA Overseas Economic Cooperation, commissioned by the Ministry of Foreign Affairs of Japan in Fiscal Year 2012. It does not necessarily represent the official views of the Ministry of Foreign Affairs of Japan.

Project Formulation Survey on Water Environment Improvement of Dams and Downstream area in Vietnam

The proposing companies and Counterpart Organization

- Name of SME: Marsima Aqua System Corp. and Nikken Sekkei Civil Engineering Ltd Joint Venture
- Location of SME: Tanimachi 5-3-17, Chuo-ku, Osaka City (Rep.)
- Survey Site: Socialist Republic of Viet Nam,
- Counterpart Organization: Ministry of Agriculture and Rural Development, Vietnam Academy for Water Resources (VAWR)

Concerned Development Issues

- Improvement of water deterioration of dams and downstream area caused by dysoxic environment of stagnant water in the dam.
- Concentration of Fe, Mn, hydrogen sulfide and nutrient salt has increased due to lack of oxygen in the water.
- Dam water quality will affect drinking water and purification process in water supply facilities.
- It will also affect daily use water and fishing industry.

Products and Technologies

- "Deep Aeration Facilities", which has been widely used for public dams in Japan to improve dysoxic environment in the water.
- The product is unique and can be partly manufactured in Vietnam, that may contribute to progress of the local economy.



Proposed ODA Projects and Expected Impact

- Development of experimental facilities: Creation of opportunity to expand distributions of proposed products and technologies
- Transfer of dam environment management technology: Promotion of Japanese environmental technologies
- Improvement of environmental guidelines: Application of technologies to local guidelines

Future Business Development of The proposing companies

- The proposing companies will expand business in Asian countries and contribute to local economy by understanding and clarifying the needs of environmental improvement measures for dam projects.



1. Description of the current situation and development needs of the concerned development issues in the surveyed country

In Vietnam, information of dam specification such as their scale and location had not been systematically studied before. In this survey, we collected the data of the dams all over the country for study and analysis. As a result, there are 619 dams higher than 15m in Vietnam and a large number of dams have been newly constructed in recent years, about 13 dams every year. On the other hand, we also found the deterioration of dam water quality due to lack of environmental conservation measures in operating the dams and there have been no survey results or information on water quality problems. In fact, dam construction in both T.T. Hue and Binh Dien Province has caused increase of Fe and Mn content in downstream rivers of the dams. JICA experts from the Waterworks Bureau of Hue City has requested the improvement of water quality of supplying sources to prevent the troubles in water treatment plants and water delivery system in the city. We conducted site investigation and confirmed the impact of dysoxic environment in the water of Binh Dien dam and Huong Dien dam in T.T. Hue Province. According to the hearing to the institute of Ministry of Agriculture and Rural Development of Vietnam, in northern Vietnam, such water quality problem has been seen in Thac Ba dam(Yen Bai Province), Ha Dong dam(Quang Ninh Province), and Xa Huong dam (Vinh Phuc Province) as well. Based on our analysis of collected data, it can be said the 390 dams out of 651 dams, which have been completed or currently planned all over the country, are likely to be affected by lack of oxygen in the water.

After the discussion about this situation with related authorities of Vietnamese government, the Vietnam Academy for Water Resources (VAWR) from Ministry of Agriculture and Rural Development showed concern to those water quality issues caused by dam construction. They are also highly interested in our products and technologies proposed by Japanese side and also are requesting to become the counterpart of the experimental project by ODA.

2. Possible applicability of the proposing companies' products and technologies, and prospects for future business development

Our products and technologies have been used widely in public dams in Japan to improve dysoxic environment of stagnant water in the dams. In Vietnam, however, such products and technologies have not been introduced yet, so it is necessary to construct experimental facilities for demonstration of the products. We estimate that 4 to 5 dams, a half of the new dams are likely to be affected by lack of oxygen in the water, as currently there have been 13 dams newly constructed every year in Vietnam. If our products and technologies are used for construction of those dams, We can operate business in stable management and expand the business opportunities in the other Asian countries in the future, too. In this project, we organize a joint group for the purpose of both risk dispersion and efficient operation: Marsima Aqua System Corp. for manufacturing, installment and operation of the products and facilities, Nikken Sekkei Civil Engineering Ltd for survey and planning of the project, and Japanese trading firms in Vietnam to support transportation, procurement and installment of the products.

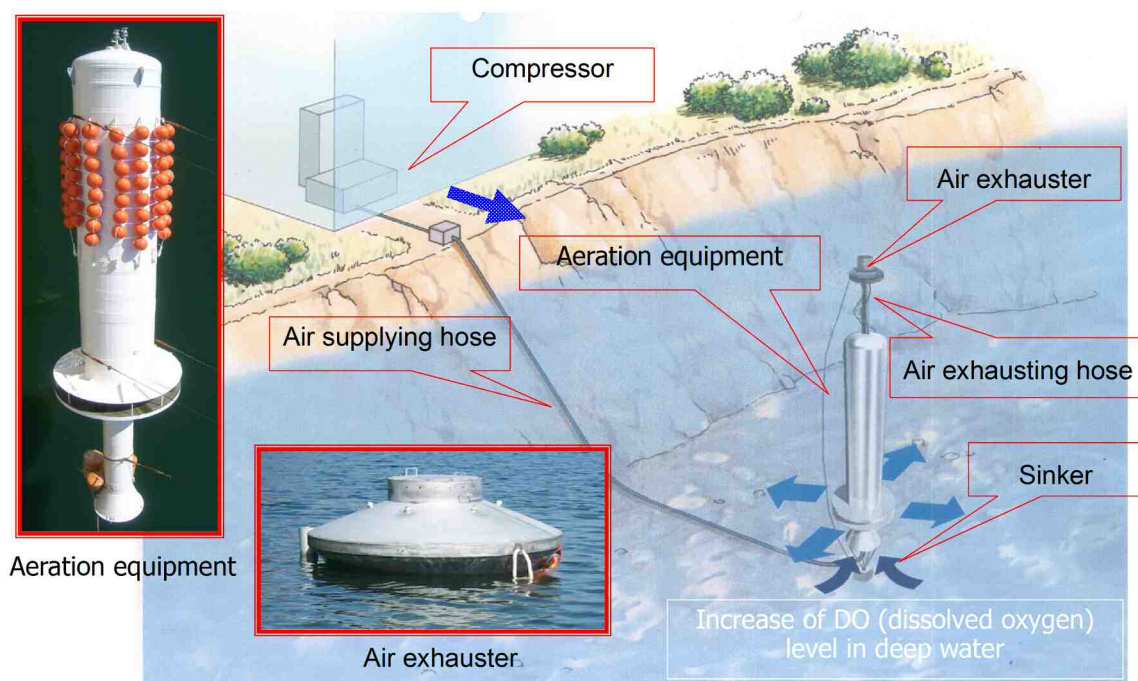


Figure-1 Deep aeration system

3. Expected development impact and effect on business development of the proposing companies in the surveyed country through proposed ODA projects

As an environmental conservation measure of dam water, proposed products and technologies can be easily installed to the dams in Vietnam with no specification changes: it will be more effective in warmer weather in Vietnam than Japan. In Vietnam, with mountainous topography, a large number of dams have been constructed all over the country except for the delta area and it is estimated about 59 percent of domestic population will be affected by the water supplying from those dams.

In this situation, ministries of Vietnam government have requested this ODA experimental project to introduce Japanese new technology to their country. They also have high expectations for the impact of the project on business development of operating companies as follows:

- Development of experimental facilities: Creation of opportunity to expand distributions of proposed products and technologies
- Transfer of dam environment management technology: Promotion of Japanese environmental technologies
- Improvement of environmental guidelines: Application of those technologies to local guidelines

4. Proposals for formulating ODA projects

To introduce our products and technologies, we considered it effective to introduce them in ODA experimental project as the first step including surveys to understand the current local situations because the products and technologies with their effects are not recognized in Vietnam. In this project, not only the installment of those products, technological knowledge can be also provided to Vietnam through technical training in Japan, as well as sending experts to teach operation and management of facilities and instruction of water environment conservation including assessment method and concept of environmental measures, and if possible, Japanese technologies can be transferred by public and private sectors.

Table-1 Proposal for formulating ODA projects

Item	Classification	Service	Term & Approximate Cost
1.Development of experimental facilities	Manufacturing and operation	-Design of equipments, planning of transportation and development of facilities -Manufacturing of equipments, procurement of ancillary equipments -Transport and installment of equipments, operation check -Instruction of operation	-21 months -120.69 million yen Separately, about 7.95 million yen will be necessary as taxes and entry customs (1 aeration equipment per 1 dam)
	Survey and assessment	-Selection of dams, site investigation -Assessment of survey results, planning of facilities size -Effect evaluation after operation -PR of effects and environmental measures	-27 months -42 million yen
2.Technical training	Training in Japan	(1)Technical training of dam environment management	-3 months -2.0 million yen
	Sending technician	(2)Instruction and supervision of facilities operation	-Total 1 month -0.8 million yen
3.Improvement of environmental guidelines	Sending experts	(1)Survey on environmental guidelines	-24 months -25 million yen
4.Popularization of facilities (mainly private sector)	Business activity	-Explanation of facility and effects to dam administrators	(the Proposing companies and cooperating firms) The companies will develop business to control systems for dams and river works after the ODA project)
	Investigation and supply	-Previous Investigation and planning , contract and installment of facilities	

Table-2 Schedule plan for formulating ODA projects

Item	Service in ODA project	2013				2014				2015				2016			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Development of experimental facilities (ODA)	(Planning of facilities development)																
	(1) Selection of dams, site investigation																
	(2) Assessment of survey results, planning of facilities size																
	(3) Design of equipments, planning of transportation and development of facilities																
	(4) Manufacturing of equipments, procurement of ancillary																
	(5) Transport and installment of equipments, operation check																
	(6) Effect evaluation after operation																
2. Technical training (ODA)	(Planning of technical training)																
	(1) Technical training of dam environment management																
	(2) Instruction and supervision of facilities operation in Vietnam																
3. Improvement of environmental guidelines (ODA)	(6) Survey on environmental guidelines																
	• Establishment of guidelines • Improvement of environmental assessment guidelines																
4. Popularization of facilities (mainly private sector)	Explanation of facility and effects to dam administrations																
	Previous Investigation and planning , contract and installment of facilities																