A CASE STUDY ON ENVIRONMENTAL MONITORINGOF A DAM PROJECT IN INDONESIA- EXAMINATION ON THE ROLE OF THE DONORS -

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1 INTRODUCTION

As concerns over negative environmental impact of large dam increases, donors extending loans to the dams have been demanded to take environment related issues more stringently into consideration (for example, WCD 2000). As a response, donors have established environmental policy and/or guidelines, and have paid more attention on the environmental impact when they are involved into dam construction projects. On the other hand, relatively less attention seemed to be paid to environmental monitoring which is to be undertaken after the construction is completed than to environmental impact assessment. Few studies have been carried out to examine the adequacy of the environmental monitoring after the completion of the dam construction and the role of the donors.

This study reviews post project evaluation of Kotapanjang dam construction projects in Sumatra Island in Indonesia, particularly on environmental monitoring and management activities. This dam was constructed for hydropower generation in mid 1990's by the National Power Company (PLN). Overseas Economic Cooperation Fund (OECF), which later became Japan Bank for International Cooperation (JIBC) extended a concessional yen loan to the project. This study first evaluated environment monitoring activities on this dam primarily based on information from monitoring report of Riau University (Riau University 2001). Then it identifies issues to be solved, and examines role of the donors to improve the situation.

2 POST PROJECT REVIEW ON ENVIRONMENTAL MONITORING

2.1 Agencies of the monitoring

Kotapanjang dam was constructed in order to fulfill rapidly increasing electricity demand in West Sumatra and Riau provinces of Indonesia. The whole project included construction of hydroelectric power plant of 114 MW and transmission lines. It was decided to extend Japan's ODA loan to the project under the Indonesian commitment to pay sufficient attention to social and environmental impacts, because the Kotabanjang reservoir covering 12,400 ha was expected to have enormous influence on the area. The project commenced construction in 1991 and started operation in 1998. The power plant now covers approximately 20 % of the electricity supply in both provinces. The responsible agency of the entire project was the National Power Company.

Environmental monitoring on the project area was to be carried out based on the Environmental Management Plan (RKL) and the Environmental Monitoring Plan (RPL), both of which were approved by the Central Environmental Committee of the Government of Indonesia in 1989. The object of these plans was to identify measures to minimize adverse environmental impact. They also identified the responsible agencies to implement each item as shown in Table 1.

Table 1: Responsible Agencies of Environmental Monitoring

Issue	Agencies
Water pollution: removal of vegetation	PLN
Water quality monitoring	PLN
Forest Protection	Department of Forestry
Erosion Control	Department of Forestry; local governments
Wildlife conservation and management	Department of Forestry
Fish conservation	Department of Fishery; universities
Fisheries development	Department of Fishery
Disease vector control	PLN; Department of Fishery
Downstream impact mitigation and development	Pubic Works Department
Land use planning	Provincial government

When environmental monitoring activities are implemented by different agencies like this case, it is necessary to assign a single agency with authority responsible to the whole environmental issues. At least, a mechanism, such as a meeting of the relevant agencies, should be established to coordinate and to facilitate the monitoring activities undertaken by various agencies. However, this mechanism seems to be lacking in this project. There seems to be no substantive coordination. PLN itself is only responsible for water pollution (except lead pollution) and disease vector control. Other issues are to be implemented by different agencies. PLN is only able to request other agencies to take action but not able to compel them. Moreover, BAPEDAL (Agency of Environmental Management), which is in charge of overall environmental issues including monitoring and EIA in Indonesia, has not been involved in this project at all. Reason is not clear why BAPEDAL was not involved in this monitoring activity.

As a result, no substantive coordination has been attained, and the actual situation of the implementation of each item was not revealed until PLN conducted monitoring the realization of the environmental management in 2001 (Riau University 2001). Many of the actions proposed by RKL and RPL in 1984 were not reported up to 2001. Almost no substantive action was reported to be undertaken in terms of sedimentation, vegetation, and laud use planning.

2.2 Water Quality

Water quality monitoring has been carried out since 1994. The frequency of sampling has been irregular, varying from zero in 1995, to one in 1994, 1996, 1998 and 2000, two in 1997 and 1999 and 2001. No explanation was made about the timing and it is impossible to study monthly change water quality. Since this area has dry and wet seasons, sample should have been corrected at least twice a year, probably in May (rainy season) and in November (dry season). At each site visit, water sample were collected from the surface, middle, and bottom of the water column (depth is not known), and mixed to make a composite sample. It is not explained why composite samples were made instead of monitoring every sample taken from different depth.

Because of this inadequate sampling method, it is difficult to accurately assess the water quality. It may be concluded that the most of the water samples have met the Indonesia's Quality Standards Category B (suitable for human consumption after boiling) except COD. The water seems to be fairly satisfactory for domestic use so far. However, coli form counts have not made for the monitoring sample although the reservoir water seems to be expected to use domestically. On the other hand, coli form were counted of the water sample taken from ponds around dam site. It was revealed the counts exceeded the clean water standard, and that the pond water was not suitable for drinking without treatment.

2.3 Wildlife

Surveys since 1999 showed that relatively few mammal and bird species have been found. Observed numbers of individuals were low and seemed to be constant between 1999 and 2001. Considering the fact that Sumatra Island is one of the places of the world richest biodiversity, both numbers of species and population seemed to be very small and the adequacy of the monitoring methodology is doubtful.

Based on the Environmental Management Plan (RKL), thirty-six elephant inhabited in the projected area were relocated in 1993 and in 1995. The Giam Siak Kecil Forest Wildlife Reserve was selected from two alternatives as it offered better elephant habitat and stronger conservation status than another option. One of the elephant died during the translocation. The fates of the other thirty-five have not been monitored since then and are unknown. Seeing natural forests being extensively converted into Acacia and oil palm plantation in the surrounding areas of the reserve, it is doubtful that the reserve has been adequately protected. There is a concern about the fate of the elephant.

The EIA lists 27 fish species in the reservoir area without mentioning their habitat. No population monitoring has been carried out. It proposed to monitor the situation of some migratory fish whose migration is hindered by the dam and to introduce their fries into the river. Fry of one of the fish species was introduced in the river, but no monitoring has been carried out. In order to benefit the local people, a fishery development action plan including fisheries research and construction of fish hatcheries was proposed. Based on discussion between implementing agencies and local people, 400,000 fish of 5 species was released at ten sites around the reservoir before April 2000. One of the species was introduced in order to control mosquito larvae. No monitoring has been carried out to assess the result of the fish introduction. No information regarding actual yield of fish and fish catch is available.

2.4 Sedimentation and deforestation

In December 2001, sediment deposition was first monitored by bathymetric method along two transects across the reservoir; one near the dam wall and another at a bridge over the reservoir. No monitoring was made at the river month, and result of this monitoring likely underestimate the rate of sedimentation.

Based on the existing insufficient data, it was concluded that estimated current sediment rate was 20.48 to 26.23 tons/ha/year, while that estimated at designing stage was 7.5 tons/ha/year. This increasing sedimentation will cause significant negative impact on the lifetime of the dam. While RKL and RPL recommended some actions to regulate sedimentations, almost no substantial action has been reported to be undertaken. Logging and slash burn are reported to be taking place in many places. People in some resettled villages feel getting poorer. This situation may force the people to further encroachment on forest regardless it is protected or not, and accelerate the sedimentation.

No substantial monitoring of forests has been made, but some fragments of information shown in Monitoring Report submitted by Riau University in December 2001 supported the above estimation of seriousness of the deforestation in the catchment area as follows;

- land around reservoir was converted to Gambier plantation (75ha);
- six stone mining stations were observed,
- lands are being converted to settlement areas along access road although these areas are to be buffer zone, and

- areas of 50m higher from water level are being converted to settlement areas.

No substantial action for forest conservation proposed in RKL and RPL was undertaken. Deforestation seems to proceed at extremely high rate. It is estimated that the annual rate of deforestation of the protected area exceeded 10 percents, higher than any other case study known in Sumatra.

3 FACTORS CAUSING INADEQUATE ENVIRONMENAL ACTIVITIES

It can be concluded that the environment monitoring after the completion of the dam construction was inadequate. There is much room to improve the situation. Major factor causing this poor environmental management and monitoring seems to be lack of mechanism to undertake necessary measures. There is no workable framework encouraging relevant agencies to implement RKL and RPL. There seems to be little incentive for other agencies than PLN to implement PKL and RPL. No authority is given to PLN to compel other agencies to the implementation. PLN is neither authorized to implement any measures by itself nor to compel relevant agencies. Moreover, PLN itself did not seem to have strong incentive for the implementation although some of environmental management activities such as forest control and erosion control will clearly benefit to it; they will extend the dam reservoir's lifetime.

Incomplete environmental monitoring can also be attributed to insufficient human and/or financial resources as generally seen in developing countries. Financial mechanism should have been established solely to implement RKL and RPL and have been included in the project cost. However, PLN did not have much incentive to manage environment and rather seemed to intend to reduce whole project cost. Under such a situation, it is unlikely for PLN to take initiative to substantially improve implementation of RPL and RKL. It is BAPEDAL that take initiative to urge PLN to implement the environment monitoring to improve the situation. However, it was not involved into any environmental activities regarding this project.

4 ROLE OF THE DONOR

It should be noted that the ultimate responsibility of the environmental management is to be taken by the Government of the project site, namely Indonesian Government in this case. However, since 1989, major projects funded by the OECF have been subject to examination based on the OECF's Environmental Guidelines (OECF 1989), which was later amended in 1995 and in 2002 to new OECF Environmental Guidelines and to JBIC Environmental Guidelines. This dam project was also examined by the OECF using the guidelines at the appraisal. The guidelines only required the OECF to check environmental aspect of the projects at the appraisal whether the procedure of the environmental impact assessment is completed according to the legislation of the recipient country. This is based on the principle of OECD recommendations regarding Environmental Assessment (OECF 1985, 1986, and 1989). Policies of the other bilateral and multilateral donors are same in principle.

While the donors pay attention to environmental impact assessment of a project during the construction, less attention seems to have been paid to environmental management after the completion of the construction. In this case, too, both Japanese Government and the OECF intensively examined EIA of the project, particularly on the resettlement issues. However, monitoring activities after project completion was not so much intensively examined as the EIA. Moreover, even if the OECF would have examined the capability of the implementation of RKL and RPL, questions would still remain whether Indonesian Government and/or PLN would really have intention to solve the problems; lack of effective coordination mechanism and the fund for the implementation.

The Japanese Government may support PLN providing their technical assistances and/or loans. For example, Japanese Government had already established Environmental Management Center (EMC) near Jakarta and had provided technical assistances regarding pollution control since the mid-1990s. Several Japanese experts on environmental monitoring had been stationed and trained Indonesian officers. If this center would have been involved in the dam project, the monitoring activities would be much more adequately implemented. However, in order to make it possible for the EMC, further work has to be done: BAPEDAL must be involved in this project because the EMC is under the control of BAPEDAL; and scope of work of Japanese experts stationed in BAPEDAL has to be amended based on the agreement concluded between Japanese and Indonesian Government. As long as BAPEDAL is not involved this project, human resource of the EMC is unlikely utilized to improve the condition.

Another possibility for the Japanese Government to deal with this issue is to extend another loan and/or send experts to improve the environmental monitoring and management activities. In order to do so, a request for this has to be submitted to from Indonesian Government to Japanese Government because Japanese ODA is provided upon "request" of the developing countries. Japanese Government does not request additional environmental measures of the Japanese ODA project to the recipients as long as the procedure of the environmental measures complies with the local regulations. Japanese Government considers imposing additional measures as intervention in the domestic affaires of the recipient government. A long as PLN does not regard the current situation as a "problem," it will unlikely request additional funding which will simply increase the total cost of the project.

In March 2003, Japanese Government announced that it would reform its ODA Charter and reconsider its "principle of request basis." (Ministry of Foreign Affairs, 2003) This may change the attitude of the Japanese Government regarding environmental consideration of its ODA projects. However, question still remains how Japanese Government identify "appropriate" environmental measures at each project sites, while the recipients of the ODA generally understand the environmental situation and the necessary measures far better than the Japanese Government.

Although not a dam project, a coal fired thermal power plant project in the Philippines can demonstrate the difficulties of the involvement of the donors. During the early-1990s, Japanese Government suspended provision of a yen loan to the Philippine Government for Calaca Power Plant for one and half year due to strong opposition of local and Japanese NGO and Japanese mass-media. Japanese NGO and mass-media claimed that the power plant was not equipped with flue gas desulferizer (FGD) which they believed to be commonly installed at Japanese power plant. Japanese Government also once requested the Philippine Government to install a FGD. After the Philippine Government officially announced that a FGD is unnecessary according to their regulation, Japanese Government finally agreed to provide yen loan (Fujikura and Nakayama, 2001). During this argument, other anti-pollution measures except against sulfur oxide emissions were adopted, and the environment around the plant was significantly improved. However, dispute over the necessity of FGD caused significant delay of the project progress.

What is worse, a restrictive approach by the donors imposing stringent environmental measures to a ODA project might have started to encourage developing countries to establish a procedure in which they asked "environmentally sensitive" donors for financial assistance on environmentally-benign projects such as hospital and school construction and then stuck to "environmentally less sensitive" sources of money for potentially controversial projects such as large dam construction project. It is doubtful whether stringent approach of the donors really improves the environmental management of the developing countries.

This case raised the following questions;

(1) how well international donors can understand environmental impact caused by a project, and how well it can propose "appropriate" measures to the local implementing agency, which normally understand the situation better than the donors,

(2) what the donor should do if the recipient recognizes a measure proposed by a donor as unnecessary, and

(3) how much the donor should "intervene" the domestic environmental policy?

Recently, donors are demanded more stringent environmental consideration, particularly for dam construction project. For example, Fifty-seven NGO's from 15 countries called on the Asian Development Bank (ADB) to "immediately and comprehensively integrate the WCD's recommendations," which request much more stringent environmental consideration, "into all ADB policies" in their open letter to the ADB (IRN, 2000). However, much studies and discussion are needed to identify "adequate" role of the donors. The authors feel very difficult to immediately solve this problem. Although it will take much time, technical assistance (and loan, if necessary) should be further provided by the donors apart from individual development projects in order to support for the recipients to recognize problems and to adopt necessary measures by themselves without strong intervention from the donors.

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