Title	Environmental soft loan program in Asian countries: industrial pollution control or mal-use of foreign aid resources?
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Citation	Journal of Cleaner Production (2008), 16(5): 612-621
Issue Date	2008-3
URL	http://hdl.handle.net/2433/253570
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Type	Journal Article
Textversion	author

Environmental Soft Loan Program in Asian Countries: Industrial Pollution Control or Mal-use of Foreign Aid Resources?

ABSTRACT:

Several Asian countries have tried to establish environmental soft loan program as a measure for industrial pollution control, with financial and technical assistances from Asian Development Bank, Germany and Japan. However, the program may contradicts with OECD's Polluter Pays Principle and may result in inefficient allocation of foreign aid, and may disturb financial market development.

This article examines conditions and context that environmental soft loan program can be justified from theoretical arguments and a case study of Japan. Then, it tries to clarify how the recipient countries satisfied the above conditions and contexts through comparative analysis of the program in Indonesia, Thailand, China, the Philippines and Sri Lanka. We'll show that the required conditions and contexts are so severe that only the Philippines could satisfy them, mainly due to mission, impartiality and competency of the Development Bank of the Philippines, as well as availability of environmental technologies and competent consultants.

Keywords

Environmental ODA, Environmental soft loan, JBIC, KfW, East Asia

1. Introduction

International institutions have provided various kinds of financial instruments for the environment in developing countries. Soft loan is one of these instruments[1]. It is defined as loan at conditions more favorable for the borrowers than loans at market conditions (Schemidt [1]).

Japan (Japan Bank for International Cooperation, JBIC) and Germany (Kreditanstalf fur Wiederaufbau, KfW) have provided environmental aid to establish environmental soft loan program in East and South Asia (Table 1). The program aimed for offering subsidized loan to pollution sources, especially industrial factories to improve the environment though emissions reduction and/or efficient use of resources. Banks, mostly government ones, are appointed to allocate, manage and revolve the fund, because they have much experiences of policy-based lending. They are expected to find much more customers with less cost than the government through their business network.

After a decade of experience, we can now see the differences in the sustainability of the programs: The Philippines continued the program and developed it at the second phase, while China replaced it with direct provision in the preparation phase, and Indonesia and Thailand cancelled the second phase of the JBIC's assistance program. We can also see the differences of the environmental and financial performance in the sub-projects: Some sub-projects had significant impacts on the emission reduction and/or efficient use of resources, while others faced default of borrowers and no significant impact on emission reduction.

Donors as well as several independent researchers have made post-completion evaluation. JBIC [2] evaluates its environmental soft loan program in Indonesia, Sasaki, Hayashi and Takagi [3] in Thailand, KfW [4] and Tsubosato [5] does its program in the Philippines and KfW [6] in Sri Lanka. All of them focus on the each program to evaluate it in view of the five indicators that Development Assistance Committee has recommended: relevancy, efficiency, effectiveness, impact (significance), and sustainability. We can find some common factors that brought the program to fall down, such as the Asian economic crisis. But they have made little, if any reference to the theoretical arguments and comparative analysis. They have not answered to such general questions as: when and where the environmental soft loan program really works for emission reduction and efficient use of resources, and why we can see the differences in the performance among recipient countries.

This article has two purposes. First, it aims to draw the conditions and contexts that the environmental soft loan program is justified from theoretical arguments and a case study of Japan. Second, it tries to clarify how the recipient countries satisfied the above conditions and

[1] Another instruments are grants, credits, hard loans, venture capital and equity.

contexts by making comparative analysis of the environmental soft loan program in Indonesia, Thailand, China, the Philippines and Sri Lanka.

2. Evaluation Framework for Environmental Soft Loan Program

2.1 When environmental soft loan Is justified? Theoretical arguments

Environmental soft loan can be recognized as a type of government subsidy. Theoretically, government subsidy can be justified for it can internalize the negative externalities caused by emission. Like as the Pigouvian Tax, it helps achieve the efficient level of emission in the short term when it is provided in accordance with emission reduction. It also help achieve efficient level of emission in the long-term when (a) fixed cost is large enough to offset the subsidy, (b) emission standard can adjust to the level where firms can earn a profit from subsidy, (c) subsidy has remarkable impacts on firms' technological innovation and diffusion activities that bring emission reduction (Lee [7]). Subsidy gives strong incentive for innovation and diffusion of environmental technologies when it is packaged with other environmental policy instruments such as command-and-control and environmental tax. Environmental soft loan is expected to have the same impacts as the subsidy that is provided in accordance with emission reduction, though they are legally different in a strict sense.

Market failure is another reason environmental soft loan can be justified. Firms may face three types of market failures on environmental technology. Firstly, they often cannot access to the information on environmental technology and hesitate to make decision on investment. Secondly, there occurs agency problem within a firm and firm's investing department do not like to decide cost-saving investment because it does not enjoy profits from cost-savings accrued to that investment. Lastly, capital market does not work efficiently, for financial institutions rarely have much information for SMEs, and rarely recognize that the environment is an attractive field of investment (Jaffe and Stavins [8]; Jaffe, Newell and Stavins [9]). Through demonstration effects, environmental soft loan program may diffuse opportunities and knowledge to other financial institutions, which may start the same program in their own accounts. This can happen especially when several financial institutions are involved in the program. In the process, they may find new customer groups, which may help develop the capital market. In addition, firms should take performance risk of environmental technology, and risk of the adverse impact on quality of their products when they invest it on (Belis-Bergouignan et al. [10]; Verheul [11]). In these cases, government subsidy may reduce the risk firms may face and encourage them to make investment.

However, these advantages cannot be realized without costs. Environmental soft loan, and

government subsidy in general, contradicts with the Polluter-Pays Principle. It has the opposite distributional result to the Pigouvian Tax that environmentalist and victims hardly accept. It also will distort resource allocation in the capital market, choice of environmental technology, investment decision and international trade (OECD [12]). This occurs especially when real interest rate is negative. In addition, it may suffer from moral hazard that arises from ineffective emission reduction (Kemp [13]): Government can make only incomplete monitoring on what kind of activities firms spend after it has provided subsidies. The cost of government failure may become bigger than that of missing market when the government cannot play this role.

2.2 Japan's experience as a referential point

Japan is said to provide environmental soft loan for industrial pollution most extensively in the world. JBIC referred to the "success" of Japan's experience on the industrial pollution control in the 1970s when it initiated foreign aid program on the environmental soft loan (Konishi [14]). Japan's experience tells us that market failure and establishment of stringent regulations do not automatically justify environmental soft loan: instead, there are several conditions and contexts that environmental soft loan program can be justified (Mori, Lee and Ueta [15]):

(a) Environmental soft loan program is integrated into stringent environmental policy and strict enforcement, and it employs some measures to minimize moral hazard on the part of firms, such as establishment and diffusion of technical standards. These measures can enhance the effectiveness of emission reduction when the government and handling banks have enough knowledge and competence for collecting and evaluating performance and cost of environmental technologies. However, inappropriate technical standard will make firms choose less cost-effective ones, which raised default risk.
(b) Terms of conditions, especially interest rate to potential borrowers is determined so as not to impair both attractiveness to firms and efficiency in resource allocation. More concessional terms of condition will attract many customers, but cause inefficient allocation in the capital market when the real interest rate is negative.
(c) The above inefficiency in resource allocation can be overweighed by the benefits of financial market development. To realize this benefit, handling banks should have enough competence in appraisal and monitoring in terms of financial soundness and environmental impact and cost of the technology. The government and consultants may help them to acquire it in case they do not have. In addition, the government

should establish a mechanism that can effectively monitor, manage, and channel the revolving fund, or the amount of repayment from borrowers. But it may increase inefficient investment or ineffective use of financial resources when the lending rate in the market becomes lower.

We can correspond to the above points to effectiveness, efficiency and impact in the DAC's evaluation indicators. In this sense, this article can be said to make de facto ex-post evaluation of the environmental soft loan program with comparative analysis of the experiences in Asia.

3. Environmental Soft Loan Programs in Asia

3.1 Background

3.1.1 Environmental regulations

All the recipients tried to take more stringent environmental measures before Japan and/or Germany provided foreign aid. Some enacted new laws and regulations, and set up new ministry to enhance enforcement, while others created new measures without legal support.

China enacted the second version of the Air Pollution Control Act in 1995. It allowed the State Council to cordon off regions in which acid rain or sulfur emissions were most serious and in which the sternest emissions reduction measures needed to be implemented (Zusman and Turner [16]). This provision led to the plan that created the Acid Rain Control Zone and the Sulfur Dioxide Control Zone in 1998, and the total pollutants emission control in the 10^{th} five-year plan. In addition, it published the Ninth Five-Year Plan (1996-2000) and the Long-Term Development Goal (1996-2010) to establish stricter deadlines for environmental regulation and enforcement.

With the disappointing experience with its EIA-based environmental strategy (Rock [17]), Indonesia started the Clean Water Program (PROKASIH) in 1989 in order to reduce the amount of pollutants discharged from firms along the most polluted rivers. The target was gradually expanded in terms of provinces and firms. Participating provinces increased from eight in 1989 to seventeen in 1995, and number of firms attained to 1900 in 1994. In 1990, two years before the JBIC assisted environmental soft loan program, the Environmental Impact Management Agency (Bapedal) was established to manage this program as well as environmental impact assessment. With the success of the PROKASIH, the Bapedal launched an environmental rating and public disclosure program called PROPER PROKASIH in 1995. It had suspended the program in the confusion of economic and political crisis, but started again in 2004.

Thailand enacted the National Environmental Quality Act (NEQA) 1992 to create the

comprehensive environmental framework law. NEQA 1992 restructured the Ministry of Science, Technology and Environment to establish three new departments: the Pollution Control Department (PCD), the Office of Environmental Policy and Planning (OEPP), and the Department of Environmental Quality Promotion (DEQP). The PCD acquired the authority to require firms to install pollution control technology and to impose more stringent standards than the Department of Industrial Works (DIW), though the latter also had the authority to enforce laws and regulations under the Factory Control Act.

Though the Philippines has yet legislated the comprehensive environmental framework law, the Department of Environment and Natural Resource gradually tightened up environmental regulations that approval of the Congress was not required. The Environmental Impact Statement System was revised in 1992, 1996, 2002 and 2003 to publish detailed procedures and rationalize them after the establishment in 1978 as a presidential decree. It made the Mid-term Development Plan (1993-98) where industrial pollution control was picked up as one of the focuses. It also set up effluent standard in 1995, and gave the Lake Laguna Development Authority (LLDA) the authority to charge environmental users fee for firms to improve the water quality of the most polluted lake: the Laguna de Bay.

These more stringent environmental measures were expected to increase demand for environmental technologies, and thus environmental soft loans (JBIC [2]).

3.1.2 Financial institutions

Japan and Germany chose these five Asian countries –China, Indonesia, the Philippines, Sri Lanka and Thailand-- not only by the seriousness of the industrial pollution, but also by the existence of government financial institutions that had made policy-based loans. This institutional precondition was critical for Germany, because it attached more importance on deepening and broadening of the financial sector by introducing new financial products (KfW [18]).

Where the government had the government development bank, they appointed it as a handling bank of the environmental soft loan program. Both donors appointed the Development Bank of the Philippines (DBP) in the Philippines, and the National Development Bank (NDB) in Sri Lanka. To create demand, both donors appointed them as apex banks and added several private banks as handling banks. The Industrial Financial Corporation of Thailand (IFCT) was appointed as the only handling bank for the Japan's aid program in Thailand, as well as the World Bank's ones.

However, there was no such bank in Indonesia. Moreover, each commercial bank, regardless of private or governmental, preferred to finance for their affiliated firms. To provide

loans to as many customers, it had no choice but to appoint several state and private commercial banks for the JBIC's program, and several regional development banks for KfW's program.

China had several government special purpose banks, including the China Development Bank and the Export and Import Bank of China (EXIM). The KfW appointed one state commercial bank, the Agricultural Bank of China as a handling bank in the first phase, and the China Minchan Bank at the second phase. The JBIC, on the other hand, appointed the EXIM as the handling bank in the Environmental Package Loan (EPL).

3.2 Emission reduction: Environmental policy- soft loan package?

In the Environmental Protection Promotion Plan (EPPP) I in Thailand, total amount of BOD reduction was estimated to 3,369 ton (Sasaki, Hayashi and Takagi [3]). Sasaki, Hayashi and Takagi [3] evaluated that firms chose appropriate pollution control technology, even though there was no established technical standard for environmental technologies and the IFCT had little, if any capacity for technical appraisal. This was because the JBIC limited the eligible technology to the proven end-of-pipe ones, and requested the IFCT to submit the project proposals to the JBIC for appraisal at the outset. To respond, only firms that could afford to hire internationally qualified consultant submitted the loan application. This minimized the moral hazard on the part of firms, at the cost of reduced number of application.

Even so, actual amount of emission reduction might be smaller than the Sasaki, Hayashi and Takagi's estimation for at least two reasons. Firstly, it has not created the legislative or institutional framework to successfully monitor and enforce emission regulations on point sources of pollution. The Ministry of Industry, that took charge of factory control, was passive in enforcing environmental regulations. Provincial and local governments had no authority and resources to control industrial pollution. There could be hardly seen any efforts for packaging stringent environmental policies and soft loan. Secondly, Thailand suffered from the economic crisis during 1997-2000. Six out of eight borrowers went through restructuring in 2002, and could not afford to finance even operational and maintenance cost of pollution control technologies they had invested on.

In the AJDF/B3 in Indonesia, impact on the emission reduction was mixed: Some firms spent the loan to install pollution control technology and reduced emission reduction, while others converted the obtained loan to expand production capacity with no impact on emission reduction[2]. The other firms spent it for the development of latest pollution control technology,

[2] Up to 1999, the Bapedal found seven cases of diversion out of seventy end-users (Bank Indonesia [23]). This happened partly due to the lack of post monitoring capacity and partly due to the lack of penalty.

but failed to install and faced default risk.

There are at least two reasons for the ineffectiveness. As in Thailand, there was no technical standard, and both the Bapedal and firms could hardly make technical appraisal and its cost. Both of them preferred end-of-pipe technology to avoid moral hazard of firms because performance and cost were deemed proven. However, the Bapedal obtained too small resources to make strict enforcement and inspection. Provincial governments had no authority and capacity to enforce environmental regulations and inspection to firms that were outside the PROKASIH, even if they were urged to solve pollution problems by residents and NGOs[3]. Under such a weak inspection capacity and authority, firms had strong incentive to cheat the government to divert the loan. In addition, there were few internationally qualified consultants. If there was, most of the firms were not afford to hire them. Some big, leading firms had incentive to develop to install most advanced cleaner production technology so that they could show that the technology would make firms comply with the regulations and bring them profit. But as they happened to hire poorly qualified consultant, they suffered from mal-performance of the technology, and failed to reduce emission.

China tried to ensure the effectiveness through the government direct involvement in the EPL. Based on the Long-term Environmental Action Plan, the central government chose the projects in the heavily polluting areas and/or that brought significant environmental improvements. However, most of local governments were reluctant to enforce environmental policies strictly, and technical standard was not established and diffused widespread. Besides local environmental infrastructure such as central heating system and the extension of natural gas pipeline, neither firms nor local governments had strong incentive to spend the loan in the same way as planned. The central government rarely enforced sanction.

However, we can find several cases that environmental soft loan reduced emissions significantly. The first case is when firms invest on new plants that had to comply with the environmental impact assessment (EIA) requirements. Firms might save costs when compared to installing environmental technologies to the existing plants because they could adjust production process in the preparation stage. Compliance made it easier for firms to convince nearby residents who were anxious about environmental damages, thus enabled them to save significant amount of time and cost. The AJDF/B3 and the EPPP provided firms with an opportunity to reduce compliance and convincement cost further, and to enhance competitive advantage.

[3] Even the success of PROKASIH and PROPER depended on creating at least minimum levels of technical capability in a national environmental agency and on attracting the right people who responded to the information on emission (Rock [17]).

The second case is when and where emission reduction enhanced their reputation for customers. Hospital was one typical example. In Indonesia, the government had established regulations to require hospitals for proper management and disposal of waste for hygienic reason, and awarded good rating for those that proved good management. The Industrial Pollution Control Credit (IPCC) Program has enabled hospitals to improve waste management by providing both soft loan and consultant fee for technical advices[4].

The Philippines and Sri Lanka had more or less better effectiveness, because the handling banks required firms to obtain Environmental Compliance Certificate (ECC) (in the Philippines) or Environmental Protection License (EPL) (in Sri Lanka). Though this requirement limited the applicants to new plants, it broadened the range of potential customers because almost all the projects had some environmental component. In the Philippines, the government granted ECC to firms when it admitted that proposed projects would not cause significant negative impact by reviewing environmental impact statement. ECC-granted firms should submit the environmental statement and environmental performance monitoring report regularly. With the assistance of technical consultants, the DBP enhanced the competence to review environmental impact statements and to monitor ex-post environmental performance of the borrowers. In this sense, the DBP carried out the same regulatory enforcement function as the Department of Environment and Natural Resources (DENR)[5]. In addition, the DBP published several studies and guidelines on environmental monitoring and technologies so that firms could use in planning projects. It distributed them widely to firms through seminars and workshops for industrial association. The range of technologies was broadened to include cleaner production as well as end-of-pipe, for the Industrial Pollution Control Programs I and II and the Environmental Infrastructure Support Credit Program (EISCP) II allowed firms to invest on both types of technologies. These measures have enabled the DBP to minimize moral hazard on the part of firms, though submitted monitoring data were incomplete and the environmental parameters were not always appropriate (Development Bank of the Philippines [19])[6].

In the NDB Small Loan Programme in Sri Lanka, all the soft loans were flanked with technical advice to assist firms in planning and implementing environmental investments. As a

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[4] Hospitals had second largest share in the KfW's Industrial Pollution Control Credit Program, followed by recycling sector in 2002.

[5] Local government has small resources for managing the environment, despite of the relative large authority delegated in the decentralization process. In addition, political appointee has made it difficult for them to accumulate the competence and knowledge in organizations.

[6] The DBP suffered from default of customers and non-performing loans. Four out of twenty seven borrowers could not repay the loan in the Industrial Pollution Control Program and three out of twenty-one in the Environmental Infrastructure Support Credit Program. But according to the officials of the DMP, this figure is lower than the average of all the lending.

result of soft loan-technical advice package, all the borrowers obtained the EPL through the investment (KfW, [6]).

3.3 Capital market distortion

All the recipient countries succeeded in disbursing the fund at the first phase of the program. However, a clear difference turned up in the period by which disbursement had been completed. Thailand allocated the fund only to eight firms, and the amount of disbursement was only two-third of the fund in the Environmental Protection Promotion Plan. Indonesia allocated it to seventy firms within 5 years but had to wait another years to disburse all of it in the ADJF/B3. These two programs had been to be expanded in the second phase, but was cancelled due to the low/ slow disbursement. Sri Lanka and Indonesia had disbursed the fund faster than expected in the first phase, but suffered from slow disbursement in the second phase. Asian economic crisis is a significant external factor, but there are several non-negligible internal factors: terms of conditions, especially interest rate.

The KfW employed the fixed rate, and determined the rate so as not to be negative in real term. With the pegging of the pass-through rates, the lending interest rate could be higher than the one in the domestic market, which impaired favorable terms of condition of the environmental soft loan. In China, the market interest rate decreased in the second phase, which reduced demand for the environmental soft loan. In response, the KfW decided to drop the environmental requirement and shifted its focus on financing for SMEs development. In Sri Lanka, the KfW's loan program lost the competitiveness when compared to the one of JBIC because it kept the real lending rate positive while the negative in real term in JBIC's program when inflation rate got higher. The amount disbursed from the fund reduced to two-thirds of the initial plan in the second phase while 100% in the first phase (KfW [6]).

The JBIC, on the other hand, applied the fixed rate to all the recipients but Indonesia. The rate was determined with little consideration to market distortion. It was determined at 8.5-13% so that the lending rate was several percent lower than offered in the market (Table 2).

Even so, it lost competitiveness in terms of condition against the domestic capital market after the economic crisis in Thailand. After the crisis, the Thai government lowered the official discount rate, and accordingly interest rate in the domestic market became lower than the one of the environmental soft loan. The IFCT, however, were unwilling to lower the lending rate of the soft loan because it would reduce earnings from the spread, the main source of their profit. In Indonesia, the government took the foreign exchange risk. It enabled handling banks to provide the loan at the same rate as the central bank bond (SBI) interest rate even after they had secured a 5% interest spread for each loan. This measure might convince many handling banks

to join in the program. However, it could increase the number of default case during the economic crisis because the interest rate jumped up to more than 40%, which doubled or tripled the firms' debt burden.

In the Philippines, the DBP set a fixed interest rate. The real interest rate did not become negative even when the Philippines suffered from increase in the interest rate.

3.4 Impact on financial market development

In the EPPP I in Thailand, the IFCT was the only handling bank, but was reluctant to provide sub-loans to firms. The IFCT had obtained no information on potential customers, including type of industry and areas. The government had few, if any information, and could not give it to the IFCT. What the IFCT did was just to distribute leaflets to the existing customers and waited them to come.

In addition, the IFCT was obliged to provide collaterals to prepare for firms' default cases. The government burdened it in other countries, but the Thai government claimed it would not offer guarantees for state bank's foreign borrowing any more. Moreover, it required the IFCT to be financially independent from the government. This drove the IFCT to earn a high spread from each soft loan program it received from foreign donors, instead of increasing the amount of environmental lending. It disbursed only the large-size, existing customers. The number of borrowers was smallest among the recipients. This signifies there can be seen no impact of financial deepening.

In the AJDF/B3 in Indonesia, nine commercial banks were appointed as handling banks and the central bank was expected to function as apex bank. With training by technical consultants, they gradually understood the function and their role in the environmental soft loan program. Some of them became proactive in providing it and tried to find out new customers, including SMEs. However, the change in the central bank's function discouraged them to provide additional loans. After the crisis, the central government stopped direct lending to firms and limited its function to control the financial market. The environmental soft loan program lost the apex bank that was expected to manage and monitor the revolving fund covering all the handling banks. Due to the loss of channeling mechanism of the repayment to other banks, each handling bank had to establish its own revolving fund in its account. But disbursement to each handling bank, thus the amount of revolving fund was uneven because the fund was allocated according to "first come, first served" principle at the outset. As a result, some handling banks faced excessive demand while other banks had too much amount of revolving fund to re-disburse[7]. In the sub-loan agreement, the government put 2% charges for revolving

[7] Most of the private banks and their affiliated firms are set up by Indonesian Chinese, which

fund when it found the fund was not used for proper purpose or it was left unspent. This discouraged both sides of the banks to continue the loan. Handling banks lost an opportunity to obtain new customers and SMEs. The AJDF/B3 has brought Indonesia financial broadening and deepening only slightly, if any.

In the Industrial Pollution Control Credit in Indonesia, the KfW required handling banks to limit the target to exiting plants. It also requested borrowers to hire technical consultant to minimize technical and default risk. To respond the demand, some handling banks offered loans to new customers and new industry such as recycling. Most of existing and new customers were SMEs that had difficulty in obtaining bank loans due to shortage of collateral. This has slightly broadened the market for environmental lending, but some of them faced default cases. As for the revolving fund, it was not worked effectively. The Bank Export Indonesia was appointed as apex bank, because it provided export credit for SMEs to expand their export under the control of the Ministry of Finance. However, the Ministry of Finance gradually shifted the priority from the development of financial institutions to sound fiscal management, and did not cooperate to enhance revolving function.

In the Environmental Package Loan in China, the EXIM was appointed as a handing bank, but could not decide which firms it provided environmental soft loan: the State Environmental Protection Agency (SEPA) and the State Development and Reform Committee (SDRC) decided the allocation without appraising firms' financial soundness. They wanted to intervene to the fund allocation when the loan would be disbursed from the revolving fund. The JBIC finally decided to replace it with the "normal" environmental aid projects for industrial pollution control (Mori [20])[8].

In the NDB Small Loan Programme in Sri Lanka, the NDB was appointed as both handling bank and apex bank, and four conduit banks were also appointed as handling banks. Participation of four conduit banks broadened the range of customers, and increased the number and amount of disbursement. But there were no lending from the revolving fund, because quality of the loan portfolio was deteriorating and demand for the fund was sluggish[9].

The Philippines has gained a better impact on financial deepening. The DBP, the only handling bank for the Industrial Pollution Control Program I and II and Environmental

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occupies large share in the economic activities. The government banks prefer lending to local Indonesian firms so that they could be competitive to Chinese firms.

[8] Provincial and local governments guaranteed the default risk, because they were devolved greater authority from the central government, and thus were regarded as those who implemented environmental projects.

[9] With the pegging of the pass-through rates, the project appraisal explicitly assumed fund depreciation. At relatively long terms up to seven years, the indexed interest rates for final borrowers also impair value maintenance (KfW [6]).

Infrastructure Support Credit Program I, was very proactive in leading not only the environmental soft loan but also the environmental initiatives of the Philippines industries. It held training programs and seminars for potential customers as well as officials of its regional branch to expand the type of industries and the number of regions for environmental lending. However, only sixteen out of seventy-seven local branches had obtained enough capacity for environmental lending. Then it invited five commercial banks to be handling banks for the EISCP II, and took the function of apex bank. These commercial banks joined it because the DBP had demonstrated the potential profitability of environmental lending, and offered a favorable terms of condition to them. They not only disbursed loans to exiting customers but found out new ones to take gain more profit from the spread. In addition, the revolving fund has worked well in terms of both financial disbursement and emission reduction. The DBP was allowed to integrate the repayment into its account and to disburse it to another projects that had environmental impacts[10].

4. Why Only Few Countries Have Gained?

Why has only few countries succeeded in managing environmental soft loan program while most of the recipient countries failed or cancelled it? The above analysis told us the intrinsic difficulty in satisfying the conditions and contexts that were pointed out in the section 2.

Firstly, as for the effectiveness of emission reduction, the recipient countries have not always established stringent environmental policies and conducted strict enforcement. But there can be found a clear difference in the extent of packaging them with the environmental soft loan program. The AJDF/B3 and the EPPP I failed to build both technical and financial appraisal and ex-post capacity in the handling banks, and could not establish and diffuse technical standards, even though the JBIC limited the range of environmental technologies to the one of end-of-pipe. The IPCC also failed in Indonesia but it provided consultant services for potential customers so that it might minimize moral hazard and allow firms to invest on cleaner production technologies. The Philippines and Sri Lanka succeeded in building them, though the requirement is limited to satisfy EIA and the implementation of the environmental management plans in the EIA report.

Secondly, as for the terms of conditions, Thailand, Indonesia and Sri Lanka faced difficulty

[10] It is uncertain whether the DBP can manage the revolving fund in the Environmental Infrastructure Support Credit Program II as well as in the first phase, because the program is on-going, and the apex bank should channel the repayment to each handling bank for disbursing additional environmental lending, the function that any recipient countries had succeeded in up until now.

in satisfying the condition due to inflation and fluctuation of the interest rate in domestic market. It has proven that the range of interest rate is not so wide. On the one hand, lending rate of the environmental soft loan became higher and its comparative advantage to the market loan will be lost unless the government takes foreign exchange risk, as occurred in Thailand and China. On the other hand, political and macroeconomic instability worsen the investment climate, which shrinks demand for environmental investments, as occurred in Indonesia and Sri Lanka. The Philippines has not suffered from this difficulty, partly because the government took foreign exchange risk, and partly because the program was postponed until it had overcome the adverse impacts of the Asian economic crisis.

Thirdly, as for the impact on financial broadening and deepening, the environmental soft loan program should be designed so that several competent financial institutions can disburse the environmental loans to regions and types of firms that had been excluded from formal financing, and the apex bank can monitor and manage the revolving fund to channel the repayment from the first borrower to potential ones smoothly. This condition is so harsh that only Japan and the Philippines can satisfy it up until now.

Why has the Philippines been able to satisfy this condition? The most important factor is the DBP‘s proactive attitude toward policy-based environmental lending. After the restructuring of the government financial institutions and policy-based lending programs, the government concentrated policy-based lending programs to a few government banks, including the DBP, the Land Bank of the Philippines. As a policy-based financial institution, it was expected to lead the government goal of sustainable economic development rather than to be financially independent from the government as in Thailand. In response, it had implemented environmental management plan since 1992. This constituted the basis for introducing environmental due diligence in the operation and for obtaining ISO 14001 certification. This internal initiative has also made it easy for the DBP to enhance competence for environmental lending as an organization. Also, the DBP had traditionally both whole sale and retail functions. It had accustomed to disbursing policy-based loans through private financial institutions, though the policy impact was evaluated to be small (Tsuji et al [21]). It was easy to expand the program to join private commercial banks because it is consistent with the DBP’s practices.

In addition, the JBIC and KfW did not stick to end-of-pipe technology or cleaner production technology exclusively focused on the core of production process. Firms tend to prefer waste recovery options at ancillary production process when dealing with environmental pollution. This is because these options do not affect the core at the production process, are less costly and more profitable, and are perceived as less technological risks (Peltier and Ashford [22]). Firms could choose more cost-effective environmental technology when obtaining environmental soft

loan from the DBP. This partly explains the widening market for environmental lending in the Philippines.

5. Conclusion

This article tries to find out when and where the environmental soft loan program is justified in general, in terms not only of effectiveness in emission reduction and efficiency use of resources, but efficiency of resource allocation both in the short and long run. From the theoretical arguments, we found the existence of negative externalities and market failure can justifies environmental soft loan program as long as the program can minimize the market distortion and moral hazard on the part pf borrowers. From the case study of the "successful" experience in Japan, we showed the following points should be taken in evaluation framework: (a) packaging of the soft loan program with stringent environmental regulations and strict enforcement, (b) establishment of technical standards and enhancement of handling banks' competence in appraisal, (c) positive real interest rate and comparative advantage of terms of conditions compared with ones of the market, (d) impact on financial deepening that outweighs the loss from inefficiency in the capital market by offering loans to SMEs through formal financial institutions.

Then we conducted comparative analysis of the environmental soft loan programs in Thailand, Indonesia, China, Philippines, and Sri Lanka. We found that only the Philippines has satisfied with the above three conditions, especially in the EISCP II. Besides avoiding adverse impact of the Asian Economic Crisis, the program has encouraged the DBP to lead the environmental initiatives and has enhanced capacity of both the DBP and the industrial association to establish and diffuse technical standards.

However, the environmental soft loan may ensure only the minimum level of environmental requirements in the Philippines, because it was just integrated into ECC, on which both the government and the DBP exclusively focus. This implies that it may not have significant impact on emission reduction of the existing sources in the Philippines. It is a future challenge to clarify whether the environmental soft loan program will still be effective and efficient way of emission reduction at existing sources, and clarify the conditions if it will be.

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Table 1 OECF and KfW's Crdit Line for Environment in Asian Countries

Country	Donor	Year	Project Name	Type	Grant Element	Amount (US1000$)	Execute Agency	Status
Indonesia		1992	Environmental Soft Loan AJDF/B3	ODA Loans	61	128,208	Ministry of Finance, Central Bank, BAPEDAL	Completed
	OECF	1996	Environmental Soft Loan IP-483	ODA Loans	65	9,044	Ministry of Finance, Central Bank, BAPEDAL	Cancelled
		1996	Environmental Soft Loan IP-483	ODA Loans	62	178,162	Ministry of Finance, Central Bank, BAPEDAL	Cancelled
	KfW	2000	Industrial Pollution Control Credit	ODA Grants	100	424	Ministry of Finance	On-going
Thailand	OECF	1993	Environmental Protection Promotion Plan I	ODA Loans	52	26,978	Industrial Financial Corporation of Thailand	Completed, with the reduction in amount of disbursement
		1997	Environmental Protection Promotion Plan II	ODA Loans	80	41,322	Industrial Financial Corporation of Thailand	Cancelled
China	OECF	1996	Environmental Package Loan	ODA Loans	-	27,716	Ministry of Finance and SEPA	Replaced
	KfW	1996	Industrial Development Bank/CIB III	ODA Loans	62	46,521	Ministry of Foreign Trade and Economic Cooperation	Changed
		1999	Private Sector SME Credit Program	ODA Loans	67	54,475	Ministry of Finance	Changed
Philippines	KfW	1996	Industrial Pollution Control I	ODA Grants	100	532	Development Bank of the Philippines	Completed
		1996	Industrial Pollution Control I	ODA Loans	81	6,114	Development Bank of the Philippines	Completed
		2000	Industrial Pollution Control II	ODA Loans	81	8,623	Development Bank of the Philippines	On-going
	OECF	1996/98	Environmental Infrastructure Support Credit Program I	ODA Loans	62	41,566	Development Bank of the Philippines	Completed
		1999	Environmental Infrastructure Support Credit Program II	ODA Loans	80	180,237	Development Bank of the Philippines and and five commercial banks	On-going
Sri Lanka	KfW	1998	NDB Small Loan Programme II	ODA Loans	81	1,137	National Development Bank of Sri Lanka and four credit institutions	Completed, with the reduction in amount of disbursement
	OECF	1998	Environmentally Friendly Solutions Fund	ODA Loans	80	20,856	National Development Bank of Sri Lanka and four credit institutions	Completed

Source: OECD-DAC, International Development Statistics. various years.

Table 2 Difference in lending interest rate between JBIC's loan and the market

Country	Donor	Year	Project Name	Rate of environmental soft loan	Market rate at the beginning	Market rate at the end
Indonesia	OECF	1992	Environmental Soft Loan AJDF/B3	Official discount rate (10% in	15.0%	23.0%
	KfW	2000	Industrial Pollution Control Credit	9-14%	16.5-18.5%	14-16.5%
Thailand	OECF	1993	Environmental Protection Promotion	10-10.75%	16.0%	6.5-7%
China	OECF	1996	Environmental Package Loan	1-3%	10.1%	-
Philippines	KfW	1996	Industrial Pollution Control I	2% lower than market rate		
		2000	Industrial Pollution Control II	2% lower than market rate		
	OECF	1995/98	Environmental Infrastructure Support Credit Program I	11.0%	18-19%	14-15%
		1999	Environmental Infrastructure Support Credit Program II	9.5-11%	15-16%	-
Sri Lanka	KfW	1998	NDB Small Loan Programme II		15.0%	13.2%
	OECF	1998	Environmentally Friendly Solutions Fund	8.5%	15.0%	10.3%

Source: IMF, International Financial Statistics. various years;
JBIC (2001), Sasaki et al (2001), Tsubosato (2006).