

Whose Sustainable Development? An Analysis of Japanese Foreign Aid Policy and Funding for Energy Sector Projects

Hideka Yamaguchi

*Center for Energy and Environmental Policy,
University of Delaware*

This article evaluates Japanese foreign aid policy in light of the World Commission on Environment and Development's concept of sustainable development by focusing on Japanese official development assistance (ODA) to energy sectors in the global South. The analysis reported here finds two fundamental weaknesses in Japanese ODA policy on the energy sector: first, its premise of the compatibility of economic growth with environmental sustainability and, second, its heavy reliance on modern science. As an alternative, this article suggests a policy of promoting small and decentralized renewable energy technology.

Keywords: *Japanese foreign aid policy, energy sector, sustainable development, ODA, development strategy, global South*

Over the past century, modernity has brought high levels of economic growth and material affluence to the global North. At the same time, however, it has contributed little to progress in the global South. Indeed, the inequity between rich and poor nations has been aggravated (Elliott, 2001, p. 11), and negative impacts, including population growth problems, environmental degradation, food shortage, and energy resource scarcity, have brought additional suffering to the global South (Ministry of Foreign Affairs [MOFA], 1999a).

With the world's second largest economy, Japan has attempted to help alleviate these distortions by adopting the idea of sustainable development as a core strategy of Japanese foreign aid policy since the 1980s.

Japan's budget provided by the government for development of the global South in the form of official development assistance (ODA) was the world's largest from 1991 to 2001 (Komori, 2002, pp. 90-91). However, its contribution has not always been successful in terms of bringing social and environmental prosperity to the global South. This is especially true of its aid in support of energy sector development. An evaluation of Japanese foreign aid policy to energy sectors in the global South shows little evidence of its contributions to sustainable development.

A History of Development Strategy and the Idea of Sustainable Development

Gustavo Esteva (1992) defined development as "a process through which the potentialities of an object or organism are released, until it reaches its natural, complete, full-fledged form" (p. 8). In reality, however, since the study of development first emerged in the 1950s, the concept has been discussed mainly in relation to the economic performance of the global South (Elliott, 2001, p. 10). To understand the basic idea of development thinking and its transition, this section examines a history of development strategy.

In the early stage of development debate, Rostow (1960) was influential. He offered a model of the linear stages of economic development, which came to be used as a means of categorizing all countries in one of five development stages—the traditional society, the preconditions for takeoff, the takeoff, the drive to maturity, and the age of high-mass consumption—

AUTHOR'S NOTE: This article was originally presented at the National Association of Science, Technology, and Society's 18th annual conference under the title "Japan's Foreign Aid Policy in the Energy Sector: Is It Doing Good or Harm?" (2003).

Bulletin of Science, Technology & Society, Vol. 23, No. 4, August 2003, 302-310

DOI: 10.1177/0270467603256089

Copyright © 2003 Sage Publications

according to their economic capacities (Rostow, 1960). This model suggested that the degree of development was to be measured by economic growth and level of consumption. Development problems confronting societies could be solved, according to the framework, by empowering markets to allocate resources, embracing foreign aid and investment to speed up “takeoff,” and applying simply modern scientific and technical knowledge to address each country’s particular needs. This concept of development helped build a hierarchical ordering with financially and technologically developed countries at the apex and less financially and technologically developed countries at the bottom. Consequently, the latter became collectively referred to as “underdeveloped” countries. In short, Rostow’s development thinking was firmly founded on an assumption that progress could be accomplished through economic growth induced by technological improvement. Such an assumption rationalized the acceleration of technology transfer from the global North to the South as a means of stimulating progress in the latter.

These development strategies to pursue economic growth and technological improvement through technology transfer, however, often resulted in negative outcomes in the global South. In examining the experience of Africa, Bade Onimode (1988) attributed the primary cause of the crises in Africa to technology transfer from the global North. He criticized technology transfer, stating that much of what was given to Africa was undesirable because it was inappropriate, capital intensive, and resource exploitative and favored foreign investment rather than domestic transformation (p. 140). From his point of view, the basic idea of technology transfer is a myth as it contributed little to progress and, instead, promoted economic and knowledge dependencies. In a similar vein, foreign technology applications in Chile with the aim of skill upgrading in the country’s production facilities demonstrated that technology transfer does not always help bring about positive consequences for the global South (see Pavcnik, 2003).

Another pattern is at play in the introduction of technology transfer, exemplified in both radar equipment in Angola and DDT in Guinea. In the former case, radar machines were transferred to Angola as a means to reduce car accidents. However, with no one trained to operate the equipment, the machines were found to be useless (although the European company realized a profit) (see Bazin, 1986). In the latter case, DDT was transferred to Guinea to eradicate malaria.

However, it resulted in damaging children’s health because of an insufficient investigation of its impacts (Bazin, 1986). Bazin (1986) argued that “modern” technology tended to be mystified in the process, creating a belief in the global South of the superiority of Northern methods and strategies, when the reverse is frequently true. As a result of the mystification process urged on by technology transfer, technologies are accepted one after another without questioning the impact of their introduction in the global South. Such mystification, moreover, often results in cultural destruction by replacing indigenous technology and reducing the global South’s self-reliance and autonomy to determine its own path to development (Bazin, 1986). The same logic is also observed in China. The pervasive idea that technology transfer is key to modernization has greatly encouraged Chinese students and scholars since the late 1970s to aggressively pursue Western scientific knowledge. This strategy has succeeded in turning out many intellectual elites who believe in the superiority of Western knowledge and culture and has contributed to strengthening the linkage between Western technology and progress. Not surprisingly, however, the result of the dominance of Western “values” is the loss of traditional values and a lack of belief in the efficacy of self-definition of China’s own course of development (Chafy, 1997).

Equally serious is the effect of technology transfer on environmental conditions in the global South. The case of the green revolution provides an example of how technology transfer can lead to environmental crisis. Between 1966 and 1970, modern technology in the form of new high-yielding varieties of wheat and rice, the so-called miracle seeds, was transferred to farmers throughout the global South. The green revolution initially showed signs of success, making remarkable advances in food supply. By the early 1970s, however, the intensive chemical use of fertilizers and pesticides began to pollute rivers and degrade soils, and the production of grains and fish began to decline (Redclift, 1984, p. 108). According to Vandana Shiva (1992), “instead of transcending the limits put by natural endowments of land and water, the Green Revolution introduced new constraints on agriculture by wasting and destroying land, water resources, and crop diversity” (p. 46).

By the 1980s, after recognizing that technology transfer did not bring satisfactory progress in development for the global South, questions regarding the validity of conventional strategies were raised. Accordingly, new development models, which would

address contradictions in the global South, were sought. The rise of a global environmental consciousness in the 1980s also helped accelerate this tendency. Under pressure to devise new strategies, the term *sustainable development* was introduced to address at least some of the problems produced earlier by development policies. In 1987, the term achieved widespread impact with the release of the UN report titled *Our Common Future* submitted by the World Commission on Environment and Development (WCED). This report defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p. 43). This definition has been globally recognized as a core ideology of development strategy that seeks to resolve the dilemmas of the past destructive method of development.

The basic idea of the WCED’s concept is that sustainable development can realize a society that economically and technologically develops and, at the same time, meets the long-term aims of social equity and environmental balance. Under the concept, progress is to be measured not only in economic and technological terms but also in social and environmental terms. To help realize these goals, the WCED stressed the need for technological improvements in both the global North and the South. From the WCED’s point of view, new technology is not only a mainspring of economic growth but also an effective device to improve the environmental resource base. Japan warmly embraced this logic of sustainable development, redefining its aid and technology transfer policies to improve the economies and the environments in partner nations of the global South.

Japanese ODA: Recent History and Policies

The government of Japan adopted the WCED’s strategy as the primary means to guide development in the global South in the late 1990s. This policy shift is specifically expressed in the new objectives and methods of ODA,¹ major government’s financial resources assigned for development of the global South.

Japan’s role as an aid donor dates from the San Francisco Peace Treaty in 1951 with an agreement to pay reparations for World War II (Komori, 2002, p. 78). Hence, Japanese ODA in the 1950s was provided mainly in the form of reparations, and accordingly recipient countries were limited to the nations that

were harmed during World War II (including the Philippines, Indonesia, South Vietnam, Burma, Singapore, Thailand, Cambodia, Laos, Malaysia, South Korea, Mongolia, and Micronesia). This reparations-centered assistance lasted up to 1985 when Japan provided its first loan to India.

The 1970s and the 1980s saw a drastic increase in the ODA budget in parallel with economic growth in Japan. In particular, the implementation of two plans, “The First Medium-Term Target of ODA: A Plan to Double ODA in Three Years” in 1978 and “The Second Medium-Term Target of ODA: A Plan to Double ODA in Five Years” in 1981, contributed to the increased ODA budget. Under these plans, \$34.1 billion² was provided for ODA from 1976 to 1985. Increasing the ODA budget was an explicit goal of the period, and this strategy eventually has made Japan the world’s largest foreign aid donor since 1991 (see Figure 1).

Another important feature of Japanese ODA in the 1980s was its focus on the improvement of the economies in the global South, believing that economic growth was indispensable for reducing poverty. Although there was no specific written policy until the 1992 ODA charter, an official document of ODA policy, Japanese aid in the 1970s and 1980s was allocated based on three basic philosophies (Komori, 2002, p. 107): First, from a humanitarian viewpoint, the country ought not to ignore the fact that many people are still suffering from famine and poverty in the global South; second, the country ought to cooperate with and recognize the interdependence among nations of the international community; and third, the country ought to support self-help efforts for economic development in the global South. In sum, Japanese ODA was primarily designed to enhance economic conditions in the global South.

By the late 1980s, with global calls for sustainable development emerging, Japan changed its priorities. It no longer would place primary importance solely on economic growth; instead, it would propose to pursue economic growth simultaneously with environmental enhancement. On the eve of the Arche Summit in 1989, Japan pledged to expand its ODA contributions in the environmental field to accomplish sustainable development with partner nations. In addition, at the Earth Summit in 1992, Japan promised to increase environmental ODA to between \$0.9 billion and \$1.0 billion (MOFA, 1999b).

This trend was accelerated with the enactment of the basic environment law in 1993 and the environ-

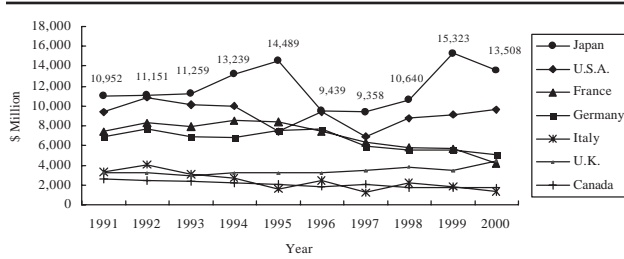


Figure 1. Official Development Assistance (ODA) Spending Trends by Major Development Assistance Committee Countries, 1991-2000

Source: Ministry of Foreign Affairs.

mental impact assessment law in 1997. Under the basic environment law, the necessity of conserving the environment in southern countries is specified in the section on “international cooperation for global environmental conservation” (Section 6 of chapter 3). Under the environmental impact assessment law, the importance of conducting an environmental impact assessment in advance of projects is stipulated to protect the environment (chapter 1).

In addition, the government announced the Initiative for Sustainable Development Towards the 21st Century (ISD). Under the ISD, sustainable development was stressed as the primary goal of foreign aid along with human security and ownership (MOFA, 1999c). A basic philosophy of sustainability was installed in the ODA charter:

Japan attaches central importance to the support for the self-help efforts of developing countries towards economic take-off. It will therefore implement its ODA to help ensure the efficient and fair distribution of resources and “good governance” in developing countries through developing a wide range of human resources and socio-economic infrastructure, including domestic systems, and through meeting the basic human needs, thereby promoting the sound economic development of the recipient countries. In so doing, Japan will work for globally sustainable development while meeting the requirements of environmental conservation. (MOFA, 1992)

In short, sustainable development, from the Japanese government’s point of view, is achieved when a balance is struck between economic efficiency and environmental sustainability.

Effects of Japanese ODA Policy on Recipient Country Energy Sectors

The government of Japan believes that facilitating development in the energy sector plays an important role in efforts to meet sustainable development in the global South:

Energy problems constitute a global-scale policy issue that is closely related to the response to global environmental problems and the achievement of sustainable development. Moreover, in many developing countries, securing access to adequate energy supplies constitutes to be a vital challenge in the realization of economic development. (MOFA, 1999d)

As the quotation indicates, the Japanese government believes that energy issues are closely linked with economic and environmental circumstances, and thus, development of the energy sector is key to progress of both areas. For this reason, Japan has actively provided substantial ODA for energy projects. Furthermore, it recognizes that technology can play a significant role in social, economic, and environmental improvements (MOFA, 1999d). In particular, the development of large, centralized power systems has been assigned high priority. According to a report from the Japan Center for Sustainable Environment and Society (JACSES), an NGO in Japan, large coal-fired power plant projects (i.e., facilities larger than 500 MW) constituted 10% of all ODA-supported coal plant projects, whereas one third of ODA-financed hydroelectric power plant projects involved dams with electrical capacities greater than 500 MW (JACSES, 1998). There are two assumptions behind this reliance on large-scale advanced technology: first, that economic improvement and environmental enhancement are compatible under the concept of sustainable development and, second, that advanced technology (in this case of large and centralized energy-related infrastructure) is a mainspring of sustainable development.

Contrary to these assumptions, however, this strategy of promoting large, centralized energy infrastructure has frequently created tragic social and environmental consequences in recipient nations. Two cases that demonstrate the sorts of effects Japanese foreign aid policy can have on societies are provided in the following sections. The Paiton coal-fired power plant construction project in Indonesia and the San Roque

multipurpose dam project in the Philippines offer glimpses of typical Japanese energy ODA.

The Paiton Coal-Fired Power Plant Construction Project in Indonesia

A \$2.6 billion venture was launched in 1995 by Paiton Energy Company (PEC), a joint holding of Mitsui & Co., Ltd. of Japan, Mission Energy Co. and GE Capital Corporation of the United States, and Batu Hitam Perkasa of Indonesia. The consortium constructed two 615-MW coal-fired power plants, using domestic coal in the Paiton District of the Indonesian island of East Java. The plants were designed to keep up with increased electricity demand in East Java province (Japan Bank for International Cooperation [JBIC], 2002). For the project, a maximum of \$900 million was financed mainly by the Japanese government-owned JBIC, the Export-Import Bank of the United States, and several Japanese and U.S. commercial banks. In addition, approximately \$100 million of Japanese ODA was provided for construction of grid extensions and transformer substations to distribute electricity from the new plants (Fujibayashi & Nagase, 2002, p. 197).

Instead of spurring economic growth and environmental sustainability, however, this capital-intensive project had negative impacts on local communities and the ecosystem. First, people whose electricity is supplied by the Paiton coal plants pay an extremely high price for the electricity. The tariff is set at 8.6 cents (U.S.) per kilowatt-hour of electricity, which is 32% higher than comparable tariffs in Indonesia and 60% higher than those in the Philippines (United Kingdom Parliament, 2002). Users are powerless to challenge the price because the project is based on an agreement that the government-owned electric utility (PLN) must purchase fixed volumes of electricity from PEC for 30 years under any circumstances. Moreover, the PEC project is a component of an electricity liberalization policy adopted by the government and, as such, has displaced older, allegedly less efficient state electricity enterprises. To date, the unbundling of the energy system in Indonesia has reduced worker job security, increased unemployment, decreased medical welfare coverage, and eroded worker solidarity (International Federation of Chemical, Energy, Mine and General Workers Union—Asia/Pacific Region, 2001). Along with these social costs, the project has also contributed to global environmental problems. An estimated 195 million tons of CO₂ are annually emitted from these

plants (Friends of the Earth Japan, n.d.-b). This amount is equivalent to 61%³ of CO₂ emissions in Indonesia in 2001 and 17%⁴ in Japan in the same year. Such levels of CO₂ emissions are certainly unhelpful to combat any global warming.

In sum, with ODA and the private sector's support, Japan has managed to facilitate a project that has increased the cost of electricity; harmed the economic condition of the sector's workforce; contributed little, if any, to economic development; and significantly increased Indonesia's greenhouse gas emissions—hardly desirable impacts for a sustainable development-inspired project.

The San Roque Dam in the Philippines

The San Roque multipurpose dam project is an ongoing \$1.9 billion venture, which will represent the largest dam when completed. This project is being implemented by the San Roque Power Corporation (SRPC), a joint holding of Marubeni (41%) and Kansai Electric Power Co. of Japan (7.5%) and Sithe Energies Inc. of the United States (51%—29% is owned by Marubeni). The purpose is to construct a 345-MW hydroelectric power plant. Approximately \$410 million has been financed by JBIC and several Japanese commercial banks. An additional \$400 million has been loaned by JBIC to the National Power Corporation, the government-owned electric utility (Fujibayashi & Nagase, 2002, p. 209). This project was designed to control flooding and to support irrigation in Central Luzon and Cordillera province. Its provision of much needed electricity from arguably the cleanest source is cited to substantiate Japanese ODA's claim of sustainability. Electricity produced by this plant will be sold to the National Power Corporation at 2.98 pesos (U.S.\$0.056)⁵ per kilowatt-hour for 25 years (Friends of the Earth Japan, n.d.-a).

The economic impact of this project is likely to be enormous. According to a report from ECA Watch (2002), "the cost of power from San Roque is hugely inflated, and SRPC stands to gain massive profits from the project, whether or not it successfully produces power." Of course, electricity consumers will suffer because they will have to pay some of the highest rates for hydropower in the world. Moreover, the Philippine economy will suffer as a substantial amount of capital is diverted to a wasteful project. A \$2.0 billion infusion into other areas could have important benefits, but these are lost when San Roque dam sequesters such a high level of investment.

In contrast to the fact that this project generates profits for Japan and the United States, the construction of the large dam will almost certainly damage the Philippines socially and environmentally. Indigenous people have been insufficiently compensated for their dislocation. Approximately 150,000 indigenous people living on 39,504 hectares classified as watershed areas were dislocated, and more than a thousand hectares of farmlands and fishponds were wiped out (Tucay, 2002). As the livelihoods of indigenous communities in the affected areas are closely connected with access to healthy ecosystems, the loss of and degradation of the watershed threaten to bring collapse to the local social system and the disappearance of traditionally valued knowledge and technologies. In addition, the project has triggered long-lasting environmental problems. The project site was once covered with forests, but the project induced large-scale deforestation. Furthermore, degradation of water quality has occurred from seawater intrusions and contamination by toxic chemicals from mining powered by the dam's electricity station (Tucay, 2002).

Assessing the Sustainability Claims of Japanese Energy ODA

The core logic of the WCED's idea of sustainable development is that it promises to bring both economic growth and a healthy environment through the use of advanced technology. This logic is claimed by the Japanese government to guide its current ODA strategy in the energy sector. Yet as the two examples suggest, Japanese ODA has contributed to promoting large and centralized energy-related infrastructure to realize economic growth, often at the expense of environment conservation.

In particular, two weaknesses in Japanese energy ODA can be identified: First, the premise that economic expansion and environmental sustainability are compatible often seems tenuous, and second, the heavy reliance on and belief in modern technology neglect a wide range of social and ecological effects. Regarding the first dilemma, the fallacy is that the application of such thinking often justifies additional present-tense economic growth, whereas protecting and enhancing the environment are given as a future-tense goal. In other words, despite an annual commitment to environmentalism as a critical element of project evaluation, this thinking actually brings about accelerated market development, letting capitalist processes influence the direction of emerging economies

at strategically key stages. Projects, such as the Paiton plant and the San Roque dam, build in energy and natural resource intensity that can stimulate growth and make it difficult to later slow down adverse environmental impacts. As more energy users connect to grids powered by these technologies, minimal energy service requirements to support economic and social demand are raised, thereby entrenching the society in a high-energy future. Regardless of how efficient a high-energy future is supplied, environmental intensity grows. Ultimately, economic expansion remains primary and environmental conservation becomes secondary in this context.

Herman Daly (1998) showed a good deal of insight into this contradiction between economic expansion and environmental sustainability. As he has argued, "It is impossible for the world economy to grow its way out of poverty and environmental degradation" (p. 285). Defining "the economy [as] an open subsystem of the earth ecosystem, which is finite, non-growing and materially closed" (p. 286), he underscored the necessity of suspending economic growth, because its foundation is the earth's ecosystem, which develops but does not grow. From this point of view, an unbalanced relationship between the earth's ecosystem and the economic subsystem can only result in a breakdown of the ecosystem. In other words, economic growth does not invite environmental sustainability. Instead, it only brings threats to the ecosystem.

Japanese development strategy demonstrates the fundamental weakness in its basic assumption. In both the Paiton and San Roque projects, there is no evidence that environmental sustainability was achieved. The only evident impact was the support of economic growth (although the Paiton plants may not even contribute this). The strategy to seek both economic and environmental progress allowed environmental considerations to be treated as subordinate to economic goals. This reality then led to underestimation of ecosystem impacts in the process of searching for economic efficiency.

The second weakness of Japanese ODA can be identified in its recognition of technology transfer as a vital factor to achieve sustainable development in the global South. In this regard, its policy raises the risk of what Claude Alvares (1992) has called "technological colonialism." The relationship between economic development and environmental conditions is one that Japanese ODA strategy assumes to be positive for recipient counties. But the evidence is, to say the least, mixed on this score.

Alvares (1992) found in the historical record evidence of what he regarded as intellectual violence resulting from the arrival of modern science in non-Western cultures during the industrial era. He argued that knowledge associated with Western science tends to reduce issues in society and nature to mere design problems. Application of modern science promotes efficiency and productivity, thereby emphasizing mechanical design over that based on community scale and capacity. Modern science in the non-Western world has found itself in conflict with local knowledge and practice, which are regarded as inefficient and nonproductive. As a result, the effort to promote economic growth through science and technology transfer often means discarding community-based knowledge.

Advanced energy technologies introduced by Japanese ODA produced the problems raised by Alvares, especially when indigenous communities are involved. On one hand, coal-fired power plants and dams allow countries to quicken the pace of industrialization. On the other hand, indigenous people are disempowered by their dislocation and the devaluation of traditional knowledge and technologies. Along with adverse social impacts, the ecosystem is transformed by its productive use. Not only are local ecosystems affected, but the relationship between nature and community is altered. Heretofore, livelihoods and relatively undisturbed ecosystems were linked, but under the sway of a more scientific, technical approach, a more abstract relation emerges in which earning income through the use of natural resources takes over.

By adopting growth-based sustainable development, the government of Japan has assumed that the "traditional" development scheme is obsolete. However, Japanese energy aid has little capacity to resolve the poverty dilemmas of the global South. At the same time, Japan's policies can seriously threaten both social and environmental sustainability. In this respect, Japan's energy ODA has changed little despite its new development aid strategy of sustainable development. Although proclaiming an interest in sustainable development, the Paiton and San Roque projects illustrate that the energy ODA strategy still depends on ideas of economic growth and technology transfer as key elements for progress and, as a result, still risks the adverse impacts discussed by Alvares and others.

The concept of sustainable development defined by the WCED and embraced by Japanese foreign aid policy has failed to deliver a shift in the country's development aid paradigm. Not surprisingly, little evidence exists that the country's energy ODA is leading to dif-

ferent results than those of the earlier framework. This throws into doubt the validity of Japan's promise to improve sustainability by means of its energy ODA.

An Alternative Policy for Japan's ODA to Accomplish Sustainable Development in the Global South: Promoting Small and Decentralized Renewable Energy Technology

If Japanese foreign energy aid policy is unlikely to deliver social as well as environmental progress to the global South, perhaps it is time to consider an alternative to a policy that emphasizes a large, centralized energy-related infrastructure. Below, a policy to implement small and decentralized renewable energy technology options is considered.

There are three reasons to suggest this policy. First, the poor, who remain mostly neglected under contemporary development schemes, would directly benefit from this policy. Because the installation of large, centralized technology in rural areas where demands for energy resources are often extremely low is not economically competitive, people in remote villages have long remained without electricity. In contrast, the installation of small and decentralized renewable energy technology systems is economically and technologically suitable for rural communities (see Zhou & Byrne, 2002). Promoting such technology increases the potential to bring electricity to those most in need. Electricity generated for these areas allows not only lighting, water pumping, and refrigerating of medications but also better communications, which can reduce the isolation of rural populations and enhance social life and safety. Moreover, the technology creates educational opportunities for women and children by freeing them from time-consuming activities such as fuel collection (Global Environmental Facility, 2002). In the end, small-scale renewables could contribute to improving the welfare of the poor.

Second, traditional knowledge and skills would be protected through this alternative policy. We have seen in the Paiton and San Roque projects that indigenous people's knowledge and technology are underestimated and displaced by modern technology because large, centralized infrastructure depends on experts and operational approaches that are out of the control of indigenous communities. In contrast, small-scale renewable energy technology could be managed by local communities, allowing villagers to participate in

the decision-making process, thereby empowering indigenous knowledge and practice. This would allow the community's values to coexist with the new technology, and as a result, the culture of indigenous and their livelihoods-based relations with ecosystems could be enhanced.

Third, environmental degradation would be significantly reduced. As renewable energy technology produces no greenhouse gas or other toxic chemicals in the process of supplying energy service, it contributes positively to long-term environmental health. A renewables-based energy system could allow communities to decide their development aspirations without being locked into the environmental contradictions of modern energy technologies and their reliance on massive resource extraction.

Conclusion

The Japanese government has applied the WCED's concept of sustainable development to its energy aid policy with the aim of removing some of the risks of the country's past development strategies in the global South. However, instead of leading to sustainable development, Japanese energy ODA projects have tended to reproduce a common pattern of social and environmental risk. Indigenous communities, in particular, have been harmed by the new policy (as the Paiton and San Roque projects illustrate). In short, Japanese energy aid policy has produced little evidence of fostering sustainable development despite the fact that this is its proclaimed goal.

An analysis of two highly touted Japanese aid projects—the Paiton coal-fired power plant project in Indonesia and the San Roque multipurpose dam project in the Philippines—demonstrates the persistence of an incompatibility between the new Japanese energy aid policy and sustainability. If Japan is to seriously tackle energy problems in the global South in a manner consistent with sustainability, it is recommended that the government shift to a policy that promotes small and decentralized renewable energy technology. Such a policy has a far greater potential to improve social and environmental conditions in the global South while preserving indigenous cultures, knowledge, and livelihoods-based relations with ecosystems.

Notes

1. In terms of the Japanese government's financial flows, economic cooperation is divided into two categories: official develop-

ment assistance (ODA) and other official flows (OOF). Generally, economic cooperation that conveys a grant element of at least 25% is called ODA, and others are called OOF. ODA is considered as the major governmental form of foreign aid.

2. The ODA budget during 1976 to 1980 was \$16 billion and during 1981 to 1985 was \$18.1 billion (Komori, 2002, p. 87).

3. According to the Energy Information Administration, the amount of CO₂ emitted in Indonesia in 2001 from combusting fossil fuels was 87.13 million metric tons of carbon equivalent ($87.1 \times 44/12 = 319.4$ million metric tons of CO₂). Therefore, $195/319 \times 100 = 61\%$.

4. According to the Energy Information Administration, the amount of CO₂ emitted in Japan in 2001 from combusting fossil fuels was 315.83 million metric tons of carbon equivalent ($315.8 \times 44/12 = 1158.0$ million metric tons of CO₂). Therefore, $195/1158 \times 100 = 17\%$.

5. The exchange rate used above is U.S.\$1.00 = 52.86 pesos (April 19, 2003).

References

- Alvares, C. (1992). Science, colonialism and violence: A Luddite view. In A. Nandy (Ed.), *Science, hegemony and violence: A requiem for modernity* (pp. 68-112). New York: Oxford University Press.
- Bazin, M. (1986, July/August). The technological mystique and Third World options. *Monthly Review*, pp. 98-109.
- Chafy, R. (1997). Confronting the culture of progress in the 21st century. *Futures*, 29(7), 633-648.
- Daly, H. (1998). Sustainable growth: An impossibility theorem. In J. S. Dryzek & D. Schlosberg (Eds.), *Debating the earth: The environmental policies reader* (pp. 285-289). Oxford, UK: Oxford University Press.
- ECA Watch. (2002). *San Roque hydropower and irrigation project*. Retrieved January 23, 2003, from <http://www.eca-watch.org/problems/philippines>
- Elliott, J. A. (2001). *An introduction to sustainable development*. London: Routledge.
- Esteva, G. (1992). Development. In W. Sachs (Ed.), *The development dictionary: A guide to knowledge as power* (pp. 6-25). Atlantic Highlands, NJ: Zen Books.
- Friends of the Earth Japan. (n.d.-a). *Destructive foreign aid: International investment and ECA*. Retrieved March 22, 2003, from <http://www.foejapan.org/aid/pdf/ecabooklet.pdf>
- Friends of the Earth Japan. (n.d.-b). *Report 01: Carbon dioxide emission induced by Japanese ODA/OOF*. Retrieved December 17, 2002, from <http://www.foejapan.org/en/aid/report/report01.html>
- Fujibayashi, Y., & Nagase, R. (2002). *How to change ODA*. Tokyo: Commons.
- Global Environmental Facility. (2002). *Renewable energy: GEF partners with business for a better world*. Retrieved May 3, 2002, from http://www.gefweb.org/Outreach/outreach-Publications/New_Business_Renewable_Energy.pdf
- International Federation of Chemical, Energy, Mine and General Workers Union—Asia/Pacific Region. (2001). *Country report: Indonesia*. Retrieved January 27, 2003, from <http://www.icemap.org/rs-en01-co-id.htm>
- Japan Bank for International Cooperation. (2002). *East Java electric power transmission and distribution network project (IV)*.

- Retrieved February 6, 2003, from http://www.jbic.go.jp/japanese/oec/post/2002/pdf/project_31_alle.pdf
- Japan Center for Sustainable Environment and Society. (1998). *JACSES briefing paper series: Sustainable development and international cooperation No. 7—Japanese ODA and climate change*. Retrieved January 27, 2003, from <http://www.jacses.org/sdap/infoservice/bps/bps07.htm>
- Komori, Y. (2002). *Reconsideration of ODA*. Tokyo: PHP.
- Ministry of Foreign Affairs. (1992). *Japan's official development assistance charter*. Retrieved February 6, 2003, from <http://www.mofa.go.jp/policy/oda/summary/1999/ref11.html>
- Ministry of Foreign Affairs. (1999a). *Japan's ODA: Annual report 1999—Part I: Official development assistance (ODA): Its track and goals*. Retrieved February 6, 2003, from http://www.mofa.go.jp/policy/oda/summary/1999/ov1_1.html#p1
- Ministry of Foreign Affairs. (1999b). *Japan's ODA: Annual report 1999—Part III: Sectoral issues for ODA*. Retrieved February 6, 2003, from http://www.mofa.go.jp/policy/oda/summary/1999/ov3_1_01.html
- Ministry of Foreign Affairs. (1999c). *Japan's ODA: Annual report 1999—Reference 8: History of Japan's assistance to developing countries (1945-1999)*. Retrieved March 16, 2003, from <http://www.mofa.go.jp/policy/oda/summary/1999/ref8.html>
- Ministry of Foreign Affairs. (1999d). *Japan's ODA: Annual report 1999—Reference 2.II. Japan's medium-term policy on official development assistance: Priority issues and sectors*. Retrieved February 6, 2003, from http://www.mofa.go.jp/policy/oda/summary/1999/ref2_02.html
- Onimode, B. (1988). *A political economy of the African crisis*. Atlantic Highlands, NJ: Zed Books.
- Pavcnik, N. (2003). What explains skill upgrading in less developed countries? *Journal of Development Economics*, 93(4), 1-18.
- Redclift, M. (1984). *Development and the environmental crisis: Red or green alternative?* New York: Methuen.
- Rostow, W. (1960). *The stages of economic growth: A non-communist manifesto*. New York: Cambridge University Press.
- Shiva, V. (1992). *The violence of the green revolution: Third World agriculture, ecology and politics*. Atlantic Highlands, NJ: Zed Books.
- Tucay, E. B. (2002). *Stop building San Roque dam*. Retrieved December 16, 2002, from http://www.inq7.net/opi/2002/jan/16/letter_2-1.htm
- United Kingdom Parliament. (2002). *Appendix 1: Recent cases of corruption involving UK companies and UK-backed international financial institutions*. Retrieved January 27, 2003, from <http://www.parliament.the-stationery-office.co.uk/pa/cm200001/cmselect/cmintdev/39/39ap06.htm>
- World Commission on Environment and Development. (1987). *Our common future*. New York: Oxford University Press.
- Zhou, A., & Byrne, J. (2002). Renewable energy for rural sustainability: Lessons from China. *Bulletin of Science, Technology & Society*, 22(2), 123-131.

Hideka Yamaguchi is a Ph.D. candidate and research associate at the Center for Energy and Environmental Policy, University of Delaware, Newark, DE 19716-7381; e-mail: hideka@udel.edu.