3. For the infrastructure development in Asia

(1) $8 trillion of Asia's infrastructure needs

According to ADB[9], it is estimated some $8 trillion is required for the infrastructure development in the region for Asia to achieve potential growth within 11 years from 2010 to 2020 (see Table 2-4-3-1). Among the estimated value, 68% is necessary for new infrastructure and 32% is needed to maintain and renovate existing infrastructure. The areas of investment are energy/electricity, communication, transportation, water supply and sanitation and its major elements are $4,090.0 billion of electricity (51%) and $2,470.0 billion of roads (29%). Besides these investments required by each country, there are at least 1,077 wide-area infrastructure projects under plan of which budget would total some $290.0 billion.

(2) Economic effect of infrastructure development

Asia has a large economic disparity as it is indicated with nominal GDP per capita ranging from $ 479 of Myanmar to $48,951 of Australia. All ASEAN10 besides three countries, Singapore, Brunei and Malaysia, have less than $5,000 of nominal GDP per capita (see Figure 2-4-3-2).

As previously mentioned, there are many wide-area infrastructure project plans in Asia. Once the infrastructure development creates industrial arteries that efficiently link industrial clusters, production sites and consumer markets, traffic of people and transportation of good will be invigorated promoting economic integration of the areas and it is expected to result in seamless development among regions. The large economic effect is estimated by including DLMV countries (Cambodia, Laos, Myanmar and Vietnam) and islands of which GDP per capita are low into the wide-area investment projects (see Figure 2-4-3-3).

Table 2-4-3-1: Asia needs eight trillion dollars in infrastructure investment (between 2010 and 2020)

[9] ADB (2009) "INFRASTRUCTURE for a SEAMLESS ASIA"

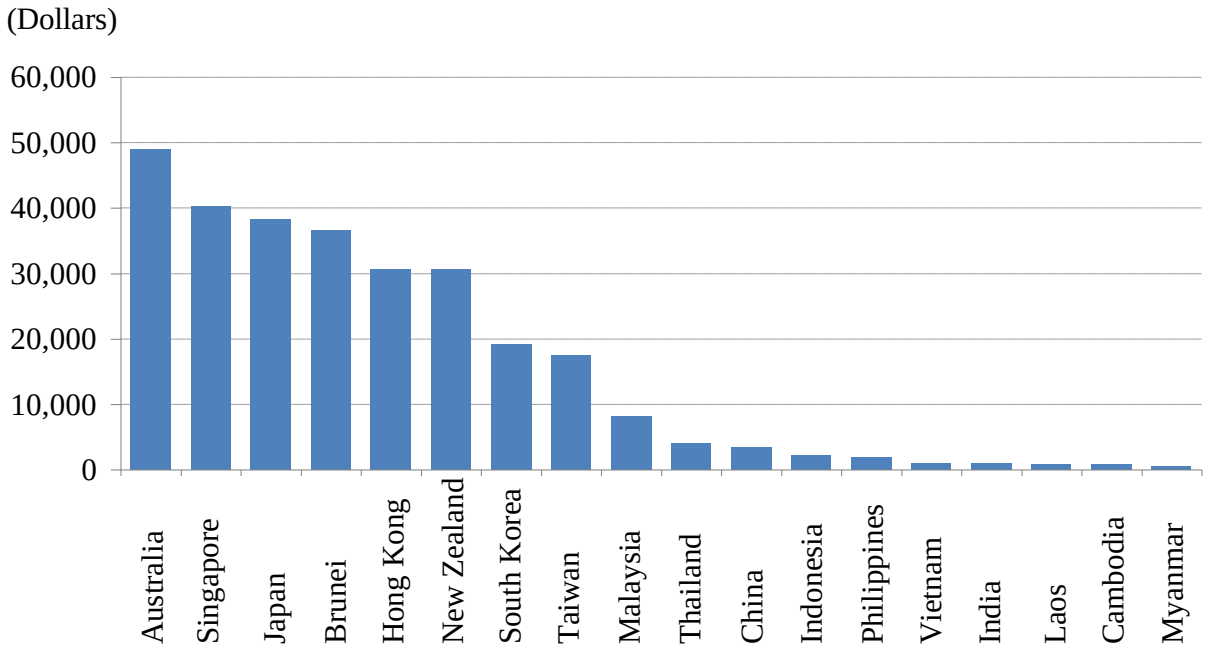
Unit: Billion dollars (Actual prices ir 2008)

Sector	New	Updated	Total
Energy (Electricity)	3176	912	4089
Communication	325	730	1056
Transportation	1762	704	2466
Airport	7	5	11
Port	50	25	76
Railways	3	36	39
Road	1702	638	2341
Water supply / Sanitation	155	226	381
Total	5419	2573	7992

Note: The target countries/regions are Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyz Republic, Tajikistan, Uzbekistan, Brunei, Brunei, Cambodia, China, Indonesia, Laos, Malaysia, Mongol, Philippines, Thailand, Vietnam, Bangladesh, Bhutan, India, Nepal, Pakistan, Sri Lanka, Fiji Islands, Kiribati, Papua New Guinea, Samoa, Timor, Tonga and Vanuatu.

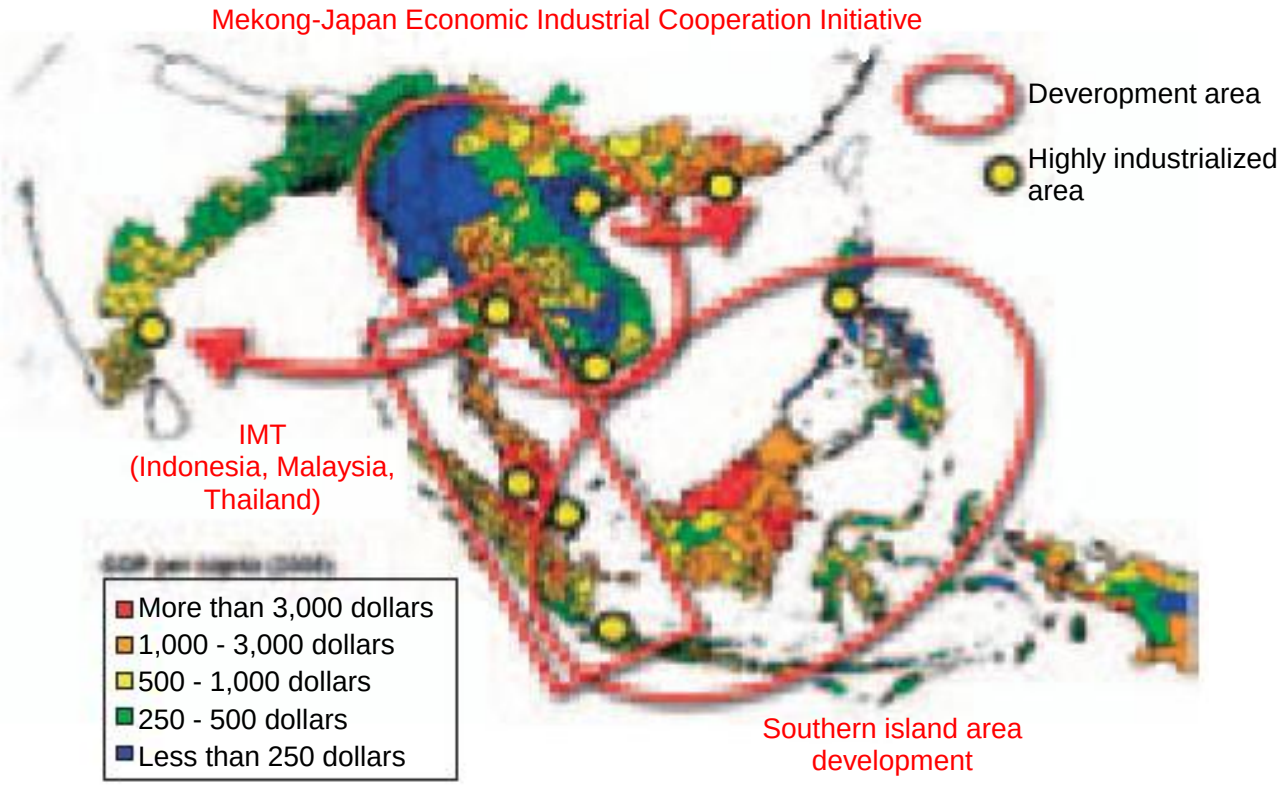
Reference: It was created according to "INFRASTRUCTURE for a SEAMLESS ASIA" ADBI.

Figure 2-4-3-2: Nominal GDP per capita by Asian country or territory (2008)



Reference: It was created according to "World Economic Outlook Database, April 2010" IMF

Figure 2-4-3-3: GDP per capita and regional development plans by Asian region



Source: Based on ERIA Material

ADB also pointed out that some $8 trillion of infrastructure mentioned above is expected to have an effect to increase real income by some $13 trillion in Asia developing countries after 2010. The breakdown is $3,550.0 billion for China, $3,140.0 billion for India, $1,280.0 for Indonesia, $1,240.0

billion for Thailand, $830.0 billion for Malaysia and $400.0 billion for Vietnam[10].

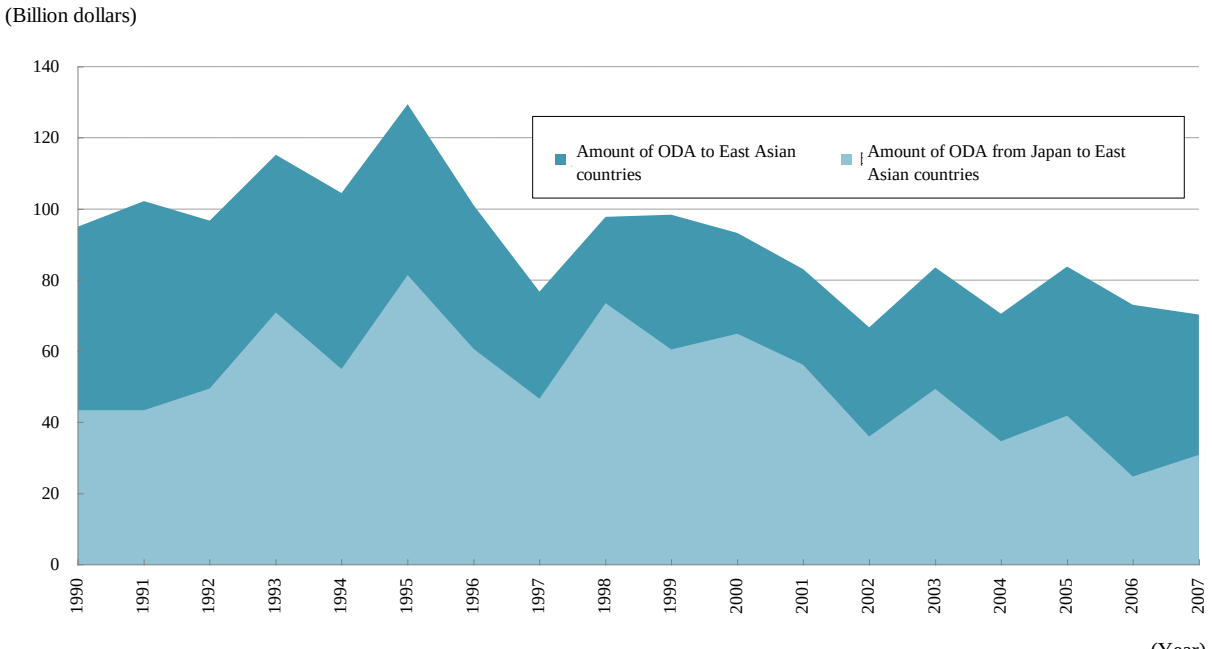
(3) Infrastructure investment capital shortage

While Asian infrastructure development requires $8 trillion (average $726.0 billion per year) in 11 years from 2010 to 2020, public development support funds and private funds that have been actually allocated to infrastructure projects are remarkably low compared to the demand. Public support funds rendered by governments of developed countries and international support organizations in the form of grants, loans and technical cooperation to infrastructure projects in East Asia is on the downward trend sliding down every year. The amount offered in 2007 stayed at some 7 billion (see Figure 2-4-3-4).

Public funds invested in infrastructure projects in Asia is on upward trend recovering from the plunge caused by the Asian financial crisis in the1990s, however, the investment amount in 2007 was some 2.20 billion (see Figure 2-4-3-5).

In this way, the public support funds and the private investment for infrastructure projects in Asia totalled only some 30.0 billion in 2007[11] which is some $700.0 billion short from the annual infrastructure budget requirements of almost $726.0 billion (see Figure 2-4-3-6). To fill the gap of capital, it is necessary to arrange fund supply to utilize public funds with new methods.

Figure 2-4-3-4: Trends in disbursement of official development assistance funds for infrastructure projects in East Asia

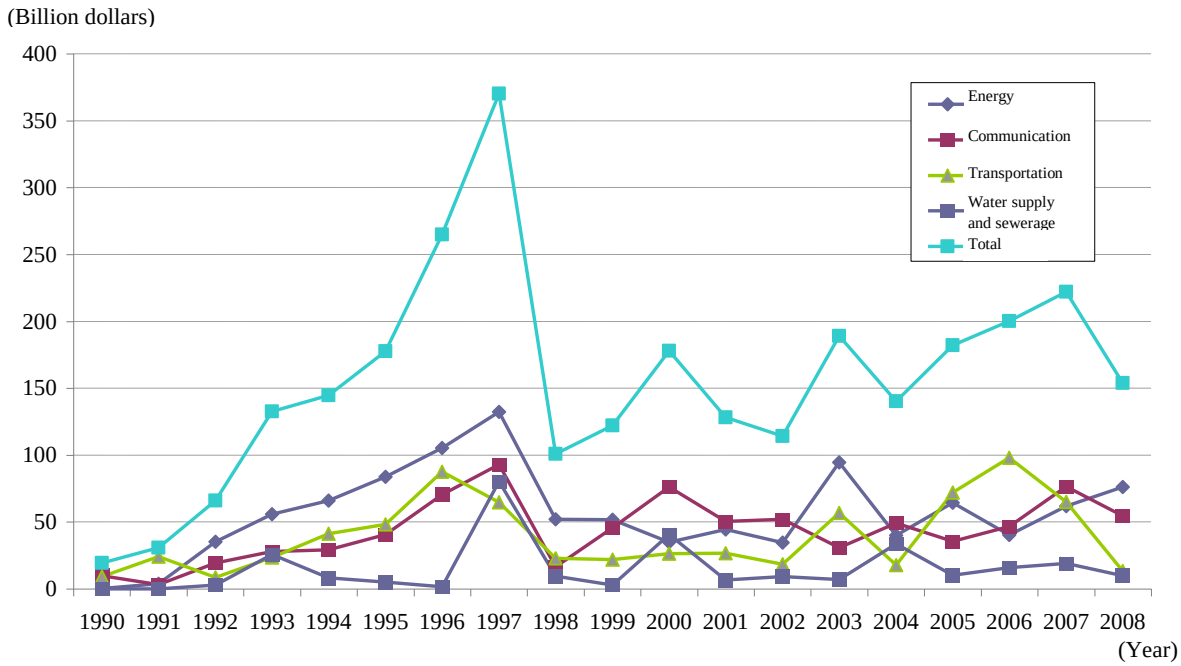


Note: The target countries are China, Indonesia, Laos, Malaysia, Mongol, Papua New Guinea, Philippines and Thailand.
Reference: It was created according to OECD-DAC

Figure 2-4-3-5: Private investment in infrastructure projects in Asia

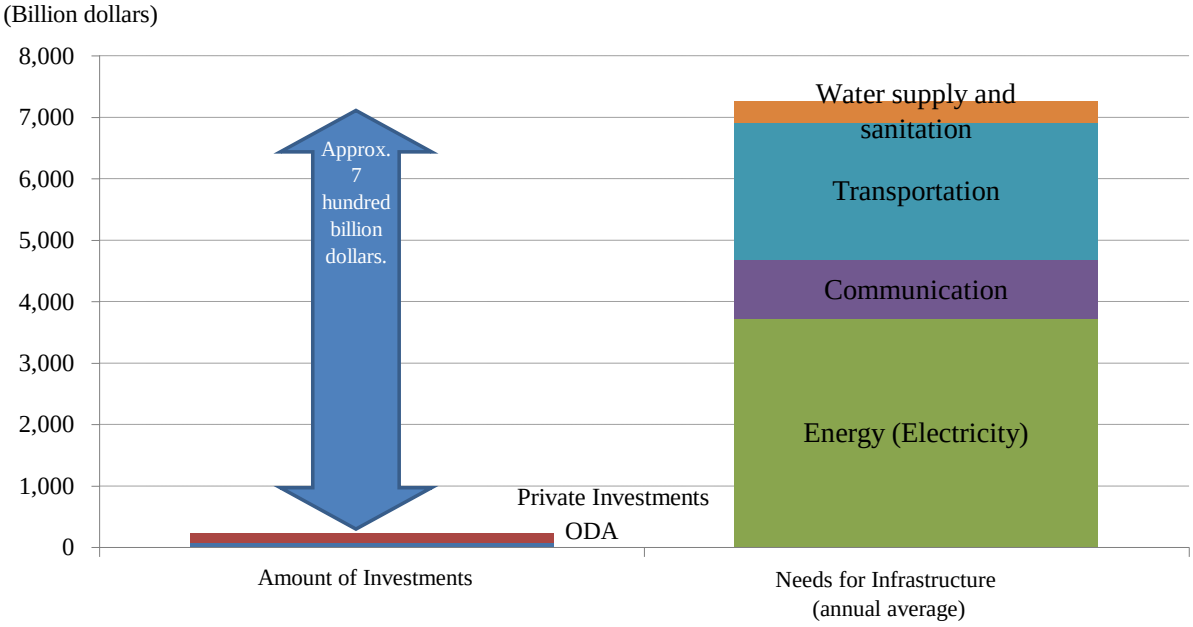
[10] ADB (2009) "INFRASTRUCTURE for a SEAMLESS ASIA"

[11] Furthermore, it is said that the demand for the infrastructure development fund cannot be satisfied even with the government spending for the infrastructure development of each Asian country. (Ministry of Economy, Trade and Industry, 2009 "Report of the Asian PPP Study Group")



Note: The target regions are East Asia and Pacific (China, Thailand, Vietnam, Indonesia, Malaysia, Philippines, Cambodia, Laos, Myanmar, Mongol, North Korea, Papua New Guinea, Fiji, Samoa, American Samoa, Marshall Islands, Solomon Islands, Micronesia, Timor, Tonga, Kiribati, Vanuatu and Belau), by the classification of the World Bank.
Reference: It was created according to "PPI database" World Bank

Figure 2-4-3-6: Amount of investment and infrastructure needs in Asia



Note: The value of amount of ODA is for Y2007. The value of amount of private investments is for Y2008.
Reference: It was created according to OECD-DAC, World Bank PPI, ADBI

(4) Japan's infrastructure development cooperation with ODA (Official Development Assistance)

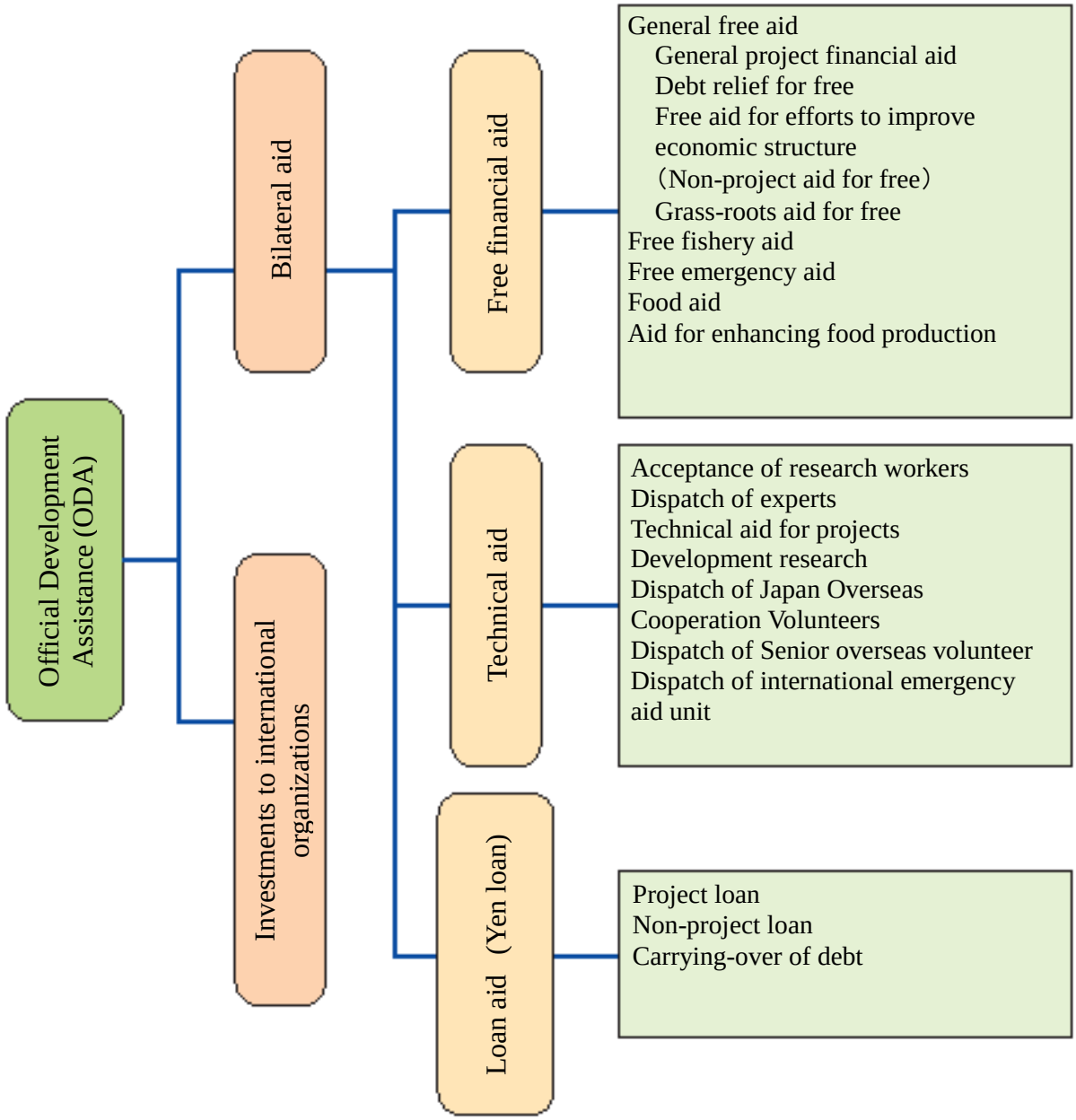
Japan's public assistance, ODA, is offered in the form of grants, loans (yen-denominated) and technical cooperation to infrastructure development in Asia (see Figure 2-4-3-7).

In 2008, 50.4% of total bilateral ODA[12] was allocated for Asia. According to disbursements by sector,

[12] The sum of grants, loans and technical cooperation based on "Japan's ODA White Paper 2009" issued by Ministry of Foreign Affairs (2009)

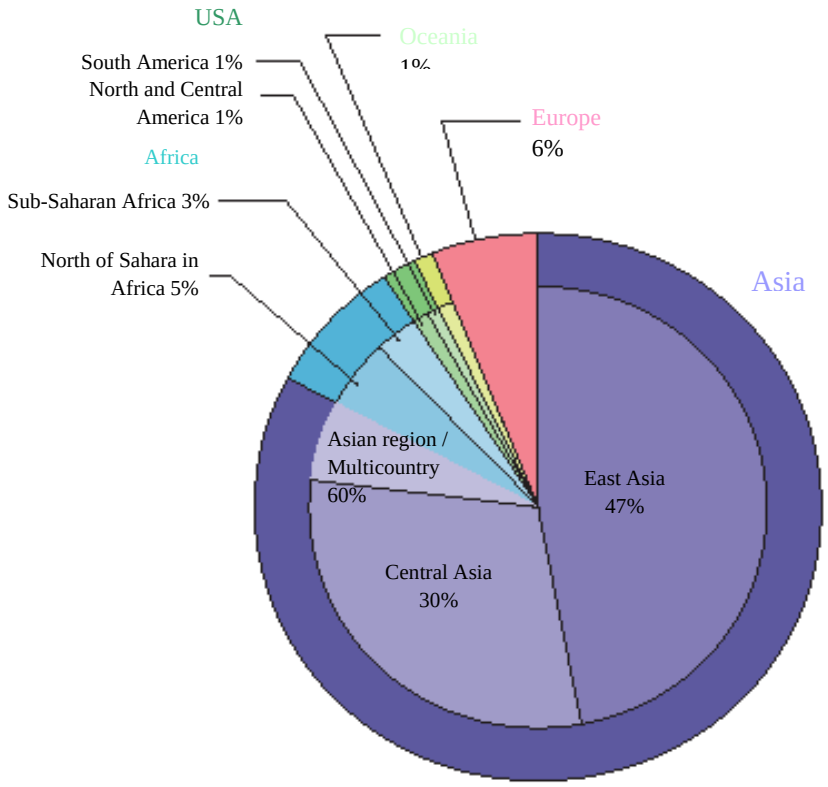
infrastructure development accounts for about a half of total[13]; 17.3% is for social infrastructure including education, health, water supply, and 37.4% is for economic infrastructure that covers transportation such as roads, railroads and ports and energy-related projects including electricity and gas. The breakdown by region of this economic and social infrastructure development totalling the disbursements from 2003 to 2007 displays the large share of East Asia which is 47% (see Figure 2-4-3-8).

Figure 2-4-3-7: The forms of ODA in Japan



[13] The sum of grants, loans and technical cooperation based on "Japan's ODA White Paper 2009" issued by Ministry of Foreign Affairs (2009)

Figure 2-4-3-8: Percentage of Japanese ODA for economic and social infrastructure development fields by region



Note: Total of 2003 - 2007
Source: Based on the website of Ministry of Foreign Affairs of Ja

Figure 2-4-3-9: Examples of cooperation carried out via loan assistance (international yen loans)

[Thailand]
Laem Chabang Port (I~III)
(1985 – 1996) 22.8 billion yen

[Malaysia]
Kuala Lumpur International Airport
(1994) 61.5 billion yen

[Indonesia]
Bali International Airport (E/S, I~II)
(1986) 3.14 billion yen

[China]
Chungking Monorail
(2000) 27.1 billion yen

[Vietnam]
Project for Safe Renovation of
South-North Vietnam Railway bridge
(I ~ II)
(2003)23.0 billion yen

[India]
Delhi Metro (Phase 1-2)
(1997- 2010) 375.0 billion yen

Reference: Based on materials from Ministry of Land, Infrastructure, Transport and Tourism of Japan

Examples of cooperation through loans (yen-denominated) include Leam Chabang port in Thailand and Bali International Airport in Indonesia. The focus of support has been the development for transportation infrastructure including ports, airports, railroads and roads (see Figure 2-4-3-9).

(5) Infrastructure development utilizing private funds with Public-Private Partnership (PPP)

"Report of Asia PPT study group" consolidated by Ministry of Economy, Trade and Industry in April 2009 defines Public-Private Partnership (PPP) as "a partnership for allowing the private sector to participate in providing public services, which aims to improve efficiency of public services through *market* and *competition* mechanisms and create new jobs and new service industries, thereby promoting economic growth." PPP is to provide private companies and various organizations opportunities to participate in projects being different from ODA support projects of which main body is public organization. Moreover, PPP is supposed to involve not only governments and private companies of developed country but also private companies of invested country. Thus, it shall be managed through the partnership of the four parties; two public sectors and two private sectors. Conventional development assistance focuses on the development of facilities. PPP development views facility development, its management and maintenance as a package and also emphasizes the output of services.

(A) PPP project cases

The methods of PPP Infrastructure development include an operation transfer method and a two-phased method[14].

(a) Cai Mep-Thi Vai International Port Construction Project in Vietnam: Operation transfer method

Cai Mep-Thi Vai International Port construction project in Vietnam aims to support the port construction with ODA and assign administration and management of established port to a private sector. Requested by the Vietnamese government, JICA conducted feasibility study for comprehensive port construction plan in southern area from 2001 to 2002 and Cai Mep-Thi Vai International Port construction project from 2004 to 2006. It 2005, JICA offered yen-denominated loans to the project. This project plans to assign the management and maintenance of port constructed with this project to private companies including Japanese companies and also provides technical cooperation such as the planning methodology for management strategies and the facilitation of regulations regarding the entry of private sector to operate the port.

(b) Phu My Thermal Power Plant Project in Vietnam: Two-phased method

In the Phu My Thermal Power Plant Project in Vietnam, the preceded part of the project which is the establishment of power plant was supported by ODA and private companies participated in the

[14] According to JICA, "operation transfer method" is to establish facilities with ODA and to let a private sector to administer and manage the established facilities. "Two-phased method" is to support planning and construction of facilities with ODA first, then to have the participation by private companies in successive facility expansion etc. (JICA website: http://www.jica.go.jp/priv_partner/policy/05.html)

subsequent part which is the construction of power generating facilities.

For the construction of No1 power generating machine, JICA has offered yen-denominated loans from 1994 to 1999. Some Japanese private companies including electric power companies and trading companies participated in the construction of No2 machine and No.3 machine. The electric power generated at this plan will be supplied to Vietnam Electricity based on a 20-year power sales contract and the power generating machines will be transferred to the Vietnamese government at the end.

Besides these projects, the utilization of private funds is expected for the Delhi-Mumbai Industrial Corridor Project, the Indonesia Economic Development Corridors and the Mekong-Japan Economic and Industrial Cooperation Initiative mentioned earlier.

(B) Necessity for strategic PPP project formation

The number of projects that have been actually materialized as shown above is currently limited. The drawback of PPP is considered to be the difficulty compared to general private investment projects: PPP projects have insufficient support scheme by public funds and the risk sharing between private sector and public sector is complicated. Therefore, development assistance organizations in the U.S. and Europe are driving the promotion to private sectors. The Japanese government needs to strategically form projects strengthening international competitiveness of infrastructure-related operators, enhancing policy support tools such as finance tool and approaching partner countries through various diplomacy channels. Moreover, it is also required to enhance project formation support tools such as feasibility study to be involved with the project from the initial phase of the formation.

At the "Task Force of PPP Policy" held in July 2009, Ministry of Economy, Trade and Industry called for the facilitation of project environment for private companies to find easier to participate by solving the issues above and conducting dialogues on PPP policy with partner governments.

Table 2-4-3-10: Main infrastructure funds intended for Asia

Fund Name	Company Name	Stronghold	Year of Application Start	Size of Fund	Situation
AIG Asian Infrastructure II	AIG Investments - Infrastructure	USA	1997	USD 1,670	Completed
Macquarie Korea Opportunities Fund	Macquarie Capital Funds	Australia	2006	KRW 1,214,200	Completed
Challenger Mitsui Emerging Markets Infrastructure Fund	Challenger MBK Fund Management	Singapore	2008	USD 1,200	Under fund-raising
AIG Asian Infrastructure	AIG Investments - Infrastructure	USA	1994	USD 1,087	Completed
CPG China Toll Road Fund	CPG Capital Partners	Singapore	2009	USD 1,000	Under fund-raising
SC-IL&FS Asia Infrastructure Growth Fund	Standard Chartered Private Equity	Singapore	2008	USD 800	Completed twice
AIF Asia I	AIF Capital	Hong Kong	1994	USD 780	Completed
Babcock & Brown Asia Infrastructure Fund	Babcock & Brown - Infrastructure Division	Australia	2009	USD 750	Under fund-raising
IDB Infrastructure Fund	Emerging Markets Partnership（Bahrain）	Bahrain	2001	USD 730.5	Completed
Korea Emerging Infrastructure	Darby Overseas Investments	USA	2006	KRW 580,000	Completed

Source: "Report of Section Meeting for Global Finance Mechanism Studies" Ministry of Economy, Trade and Industry
Original Source: 2009 Preqin Infrastructure Review

Table 2-4-3-11: Main infrastructure funds intended for India

Fund Name	Company Name	Stronghold	Year of Application Start	Size of Fund	Situation
Macquarie State Bank of India Infrastructure Fund	Macquarie Capital Funds	Australia	2009	USD 2,000	AA
3i India Infrastructure Fund	3i	UK	2008	USD 1,200	Completed
Trikona Infrastructure Trikona	Capital	India	2007	USD 1,000	Completed
India Infrastructure Advantage Fund	ICICI Venture Funds Management	India	2008	USD 1,000	Under fund-raising
Principle Europa Indian Infrastructure Fund	Principle Europa Indian Equity Partners	Switzerland	2009	USD 1,000	Under fund-raising
IDFC India Infrastructure Fund	IDFC Project Equity Company	India	2008	USD 1,000	Completed twice
JPMorgan Asian Infrastructure & Related Resources Opportunity Fund	JPMorgan - Infrastructure Investments Group	USA	2008	USD 1,000	Completed twice
Asian Giants Infrastructure Fund	AMP Capital Investors	Australia	2009	USD 750	AA
IDFC Private Equity Fund III	IDFC Private Equity	India	2008	USD 700	Completed
Old Lane India Specific Fund	Old Lane Management	USA	2006	USD 500	Completed

Source: "Report of Section Meeting for Global Finance Mechanism Studies" Ministry of Economy, Trade and Industry
Original Source: 2009 Preqin Infrastructure Review

(6) Rising attention towards Infrastructure funds

While demand for infrastructure development expands, infrastructure funds that utilize private capital are also receiving attention. The fund is called “Collective Investment Scheme” and has a system to collect capital from others, operate/invest in a business and distribute the profit among investors. Infrastructure fund is the name for all funds that are dedicated to infrastructure investments.

Currently established infrastructure funds are mostly American and European investment funds that utilize the capital of pension funds in the U.S. and Europe. Lately, the formation of India fund is increasing and the strengthening move towards infrastructure investment in Asia is observed (see Table 2-4-3-10 and 2-4-3-11).

In September 2009, ADB announced “Infrastructure for a Seamless Asia” and appealed the necessity to establish Asia Infrastructure Fund (AIF). Internationally, Infrastructure funds started gaining attention. In addition, ADB began the sales of “Water Bond” to Japanese private and corporate investors in April 2010. The capital acquired through this bond will be utilized as the fund for ADB’s water-related projects in Asia-Pacific region[15].

In October 2009, Ministry of Economy, Trade and Industry hosted “Global Finance Mechanism Subcommittee” based on “Taskforce for PPP Policy” which was introduced before to promote infrastructure development utilizing PPP to meet with huge infrastructure demand in Asia. The subcommittee posted the direction for Japan’s measures to develop the new financial mechanism to actively and effectively promote infrastructure development. The proposal includes the promotion of investments in infrastructure funds by establishing infrastructure funds which are mainly managed by Japan’s pension fund and institutional investors and the promotion of the utilization of project bonds.

(7) For Japan’s growth by investing in infrastructure in Asia

Asian economy which has achieved high growth depending on the demand from developed countries, mainly the U.S. and Europe, has high saving ratio, however, its investment in the region is suppressed

[15] Press releases by ADB and Daiwa Securities Co., Ltd.

low. It is desirable to shift the saving of Asia to investments mainly in infrastructure development in Asian region to assist its sustainable growth by expanding domestic demand. In Japan, it is expected to invest in infrastructure development in Asia that will increase financial assets in Japan. Moreover, it is important for Japanese company to build a business model that assures long-term profits such as through the acquisition of operation rights in infrastructure development projects in Asia. In these ways, it is expected to link the development of Asia to the growth of Japan.