

The Impact of Japan's Official Development Assistance (ODA) on Indian Infrastructure

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Abstract

Poor infrastructure is a constraint to sustaining India's high and inclusive growth rate. Infrastructure development—both physical and social—enhances the productivity of both physical and human capital, and makes the economy competitive. One major bottleneck in infrastructure development is infrastructure financing (along with many others, such as land acquisition, environment clearance, cost-time overruns, etc.). The Planning Commission, Government of India (GoI) estimates that US\$1 trillion will be required towards investment in infrastructure under the Twelfth Five Year Plan (2012–2017). The lack of budgetary resources forces the GoI to rely on private sector and international donors for 50% of its total funding. The assistance from Japan under its Official Development Assistance (ODA) programme through the Japan International Cooperation Agency (JICA) has been particularly important—India has been the single largest recipient of Japanese ODA since 2003–2004—as it is heavily directed towards long-term participation in infrastructure, much of which comes from the enormous demand. In this context, this paper explores the impact of Japan's ODA on the infrastructure sector in India; analyses a few specific mega-infrastructure projects it supports; lists priorities for Japan's ODA in the future; and considers the problems and challenges facing Japanese ODA to the infrastructure sector in India.

1. Introduction

Foreign aid and development assistance (DA) to resource-scarce developing and lower developing countries adds investment capabilities in social and physical capital, enhances the productivity of factor endowments, and facilitates imports of essential capital goods and technology; thereby, it contributes to long-run economic growth (Radelet 2006). Many studies highlight the positive relationship between aid/DA and economic development through positive impact on development outcomes such as health and education (Papenek 1973; Levy 1988; Levine *et al.* 2004). The best-documented area leading to developmental outcomes is observed in the health sector, where aid-supported programmes have contributed to the eradication of small pox, the near-eradication of polio, control of river blindness, combating diarrhoea, and increase in immunisation rates in developing countries since 1970. However, the debate continues, and several studies show a weak relationship between aid and economic growth (Dowling and Hiemenz 1982; Singh 1985; Boone 1994;

Rajan and Subramanian 2005). Aid can spur inflation and cause a real appreciation of the exchange rate, which reduces the profitability of production of all tradable goods, creating 'Dutch disease' effects (Adam 2005; Rajan and Subramanian 2005; Bulir and Lane 2002; Prati *et al* 2003). In this context, the form and pattern of aid to developing and low-income countries has changed over the years. To ensure the effectiveness of aid/DA and avoid the principal-agent problem, there have been efforts for greater donor selectivity in choosing aid recipients, increased recipient participation in setting priorities and designing programmes, streamlining aid bureaucracies, increasing donor coordination, establishing clearer goals for aid and stronger monitoring and evaluation of aid-financed activities (Radelet 2006).

Over the years, developed economies have been shifting from aiding developing countries through open-ended grants to giving them DA such as concessional loans that focus on developmental priorities. As developing countries like India struggle to mobilise the investment required in social and physical infrastructure, DA focuses increasingly on developmental projects in health, education, infrastructure, poverty, and environment.

As explained above, the need for quality physical infrastructure for economic development is well documented and widely acknowledged (Aschauer 1989; Easterly and Rebelo 1993; Roller and Waverman 2001; Caldero´n, and Serve´n 2004; Canning and Pedroni 2004; Sahoo and Dash 2009). The existence of easily available quality infrastructure not only encourages investment but also, as a result, aids the economy's overall output and productivity. While India is still one of the world's fast-growing economies, substantial investment in infrastructure is required to sustain India's high growth (PwC 2008; Nataraj 2013). The nature of commitment shown by governments goes on to determine the health of an economy's infrastructure. According to a study by Marjit *et al.* (2011) of the Indian context, greater capital expenditure on physical infrastructure has a very positive impact on the long-term GDP growth of the economy; and the overall thrust of government spending in India over the years has been on redistributive policies, not physical infrastructure, through revenue expenditure, which has had a negligible effect on growth rates.

To remove infrastructure hurdles, the GoI intends to spend \$1 trillion on infrastructure projects under the Twelfth Five Year Plan (2012–2017). It is expected that the private sector will contribute nearly 50 percent of this infrastructure requirement. At the same time, the GoI is interested in foreign assistance to augment the infrastructure potential of India. In the past, India has benefited from funding through not only external sources (including FDI) but also domestic private investment in infrastructure.

India also regularly receives international assistance in dealing with its massive infrastructure problem. According to the Planning Commission's Working Sub Group on Infrastructure for the Twelfth Plan, the GoI will seek to meet 50 per cent of its infrastructure financing by budgetary allocations. However, the extent of international assistance in the form of loans/grants, etc. (debt) or FDI (equity) that India receives is large. In the calendar year 2011–12 alone, India received Rs34735 crores from friendly countries and other international organisations such as DFID, World Bank and Asian Development Bank (ADB) by way of loans, aid, grants, etc. for economic development—most of it specifically for the infrastructure sector.¹ When it comes to bilateral relationships, the assistance from Japan under its ODA programme through the Japan International Cooperation Agency (JICA) has been particularly important.

In terms of Japanese cooperation with India on infrastructure, the Delhi Metro has by now attained archetypal status. India has also become the largest recipient of Japanese ODA loans. Only recently, India received an 'infrastructure building' grant of \$2.3 billion from Japan to build a freight corridor between New Delhi and Mumbai, respectively India's national and commercial capital (*The Hindu* 2013). According to the JICA, the cumulative Japanese pledge of ODA loans to India as on March 2013 was ¥3,781 billion (Rs 229,100 crores) involving around 230 loan agreements. Recently, India invited Japan to help build roads and develop water supply in the North Eastern states. Japan's natural potency in capital-intensive long gestation projects and India's funding deficit in infrastructure makes India and Japan natural win–win partners. The JICA's continuing role in India's infrastructural development over the years and their unwavering commitment to India's economic potential are testament to how great a role Japan has played in India's infrastructure needs so far (Nataraj and Bhunia 2014).

In sum, it is evident that Japan is one of the largest donors of DA to developing and lower-income countries, and that India is the largest recipient of Japanese DA. In fact, Japan extended its first ever ODA loan in 1958 to India; and India has been the single largest recipient of Japanese ODA since 2003–2004. Japan also exempted India from the cuts it made in its ODA following the March 2011 disasters in Japan. Japan's ODA is designed to help India achieve high growth in infrastructure, which is the main bottleneck in India's

¹ For over 25 years now, the ADB has been supporting infrastructure projects in energy, transport, and agriculture (among other sectors) in 22 states in India. Recently, under its Accelerating Infrastructure Investment Facility in India (AIIFI) scheme, which involves the disbursement of a total sovereign loan of \$700 million to India, the ADB released the first tranche, of Rs 2,472 crores (ADB 2014). The World Bank is funding India's much-touted Eastern Dedicated Freight Corridor.

efforts to achieving and sustaining high growth rates. In this context, the present paper examines the role of Japan's ODA to India for infrastructure development. The paper highlights how Indo–Japan cooperation is heavily directed towards long-term participation in infrastructure, much of which comes from the enormous demand. Japanese ODA has made an impact in various sectors and projects and changed the urban landscape in a few Indian cities and made life easy for the common man. Finally, the paper deals with the problems and challenges facing Japanese ODA to the infrastructure sector in India.

2. Need for Official DA for India's Infrastructure Development

The lack of world-class infrastructure has created problems aplenty for India. The recent slowing down of the Indian economy and persistent inflation can be attributed to shoddy supply-side conditions in India. In particular, and despite some improvements, the transport infrastructure remains undersupplied. The accessibility, quality and efficiency of infrastructure, mainly energy, water and transport (land/railways/ports), are crucial recipes for economic growth and India's performance in these sectors leaves much to be desired (Nataraj 2007, 2013). If the current trend of inefficient infrastructure is not corrected, India could lose around 10 per cent of its GDP in the year 2017 (McKinsey 2009). According to some estimates, the Indian economy endures a 2 per cent reduction in its GDP growth rate annually owing to inadequate infrastructure alone.

In the Tenth Five Year Plan, the delivery of infrastructure, particularly in the power and civil aviation sectors, fell far short of the planned expenditure. Over the Eleventh Plan, some progress was made as the total investment in infrastructure increased from 5.7 per cent of the GDP to 8 per cent of GDP. However, investments fell short of the \$500 billion target anyway. Subsequently, in its recent Twelfth Five Year Plan (2012-2017), the Planning Commission acknowledged that the infrastructure sector requires funding of around US\$1 trillion. The manufacturing sector needs to be boosted so that the economy can continue to provide the unemployed jobs.

India experienced high growth rates in the decade of the 1990s, post the inception of the economic reforms programme, and in the beginning of the 21st century. But with the occurrence of two economic shocks — global financial crisis followed by the sovereign debt crisis — the growth scenario in India was adversely affected. In the last few years, the country has been making all efforts to revive the pre-crisis growth momentum. The key measures to revive growth centred on giving a boost to the manufacturing sector, tight monetary policy, fiscal stimulus etc. In the Twelfth Five Year Plan, Government of India has set a major goal of 'faster, sustainable and more inclusive growth'. The precondition for faster and

sustainable growth is to develop quality infrastructure to attract more investment domestic as well as foreign. However, India's biggest problem lies in costs related to undeveloped infrastructure. There is a serious problem with frequent power outages and a constant shortage of electrical power, making power generating equipment essential for factories. In the area of distribution, for example, since passengers are given priority for rail transport, the train schedule is easily disrupted. In addition, transport fares for freight are set higher than fares for passenger travel, and since trunk roads are undeveloped, there are frequent delays and damage to the freight.

For a nation touted to be a leader among developing economies, India faces several crippling concerns raised by its infrastructural flaws and shortcomings. Despite fast growth and relative vitality shown during the global financial crisis, India did not/has not done enough to compensate for its lack of infrastructure. Undoubtedly, there has been a significant improvement but one could argue that it still needs significant levels of governmental and private commitment towards growth of infrastructure.

The 11th Five Year Plan brought back focus on infrastructure, in this plan, total investment in infrastructure increased from 5.7 per cent of GDP to 8 per cent of GDP. Significant progress has been made due to the active part played by the private sector as a stakeholder in the Indian growth trajectory. Public sector investment is still expected to fund a large number of projects, but there is increasingly more emphasis on private sector investment. Re-enforcing the objectives of the Eleventh Five Year Plan, the Twelfth Five Year Plan aims to achieve 50 per cent private and Public-Private Partnership (PPP) funding. Total investment in the 12th Five Year Plan is expected to cross US\$ 1 trillion and infrastructure investment as a percentage of GDP to increase from 8 per cent to 10 per cent of GDP over the aforementioned five-year period (Fig 1). Public deficit and capped government borrowing limits state participation in infrastructure financing, requiring private sector participation through PPPs. Currently, around 800 PPP projects have been implemented but the nation is still far from even reaching its potential.

The increasing use of the PPP model to finance mega-infrastructure projects is admittedly an exercise in order to ensure efficiency in execution and curb cost and time overruns that are typical of fully state funded programmes. Under the 12th Five Year Plan, the private sector is likely to be a major source of funding for power projects at 51 per cent of total investments. The PPP model although relatively new is catching up fast and this is especially true of highways and roads projects. The total number of infrastructure projects in India that have taken the PPP route rose from 450 projects worth Rs 2242 billion in November 2009 to 758

projects worth Rs 3833 billion in 2011-12. Over 240 PPP projects with a value of US\$14.5 billion have been delivered over the last 15 years. India is second only to China in terms of number of PPPs. India is also second only to Brazil in terms of investment in PPPs. The share of the private sector and PPPs towards infrastructure creation increased manifold between the 10th and 11thPlans but the growth has been exponential between the 10th and the 12thPlans.

However, India fares miserably if compared with its competitor, China, and the only developing country growing at a faster pace. During 2006-07 to 2012-13, India's rank fell from 62 to 85 with respect to infrastructure development indicators. During the same period, China moved up the ladder to a rank of 48 from 60 (Table 1). South Korea has also risen from a rank of 21 to a rank of 11. This clearly shows that despite considerable effort, India has not been able to match other developing and emerging economies in boosting its infrastructure. Essentially, all the growth in infrastructure over the last decade has not helped India consolidate its position globally. In the infrastructure development indicators, India does better than China only as far as telecommunications (specifically mobiles) are concerned. Table 3 compares major infrastructure indicators between India and China indicating increasing gap between levels of infrastructure development between two countries in recent years.

In order to remove the infrastructure hurdles, the government intends to spend \$1 trillion on infrastructure projects under the Twelfth Five Year Plan. And it is expected that private sector will contribute nearly 50 per cent of this infrastructure requirement. At the same time, government is also interested to augment the infrastructure potential of India through foreign assistance. In this direction, past experience of Japanese Official DA (ODA) loan to India for infrastructure development has been well appreciated. With India investing heavily in infrastructure, Japanese assistance — both technical and financial — has been of great benefit. Japan's post-war experience, leading to its subsequent economic boom in the 1970s, is a success story that India should seek to emulate. Japanese ODA continues to help India bridge the huge infrastructure deficit that exists.

3. Japan's Overseas Development: A Brief Review

The history of Japan extending ODA loans to other countries goes back to 1950s, when Japan aimed at promoting friendly relations with Asian countries. With high economic growth and powerful international status, its foreign aid expanded in scale and the form of its aid diversified. Japan follows the concept of Official Development Assistance (ODA) introduced

²<http://www.niua.org/upcoming%20seminars/metropolis/sujatha.pdf>

by Development Assistance Committee (DAC) of the Organisation for Economic Cooperation and Development (OECD) where the General Assembly of the United Nations proposed donor countries to allocate 0.7 per cent of their Gross National Product (GNP) to ODA in 1970.

Over the years, Japan diversified its ODA into various areas focusing on basic human needs, human resources development, and economic infrastructure with emphasis on its geographical distribution (Middle East, Africa, Latin America, and the Pacific regions in addition to Asia). Since 1978, Ministry of Foreign Affairs (MOFA), Japan, believes that Japan can ensure its security and prosperity only in a peaceful and stable world. One of the most appropriate means for Japan to contribute to the peace and stability of the world is through providing assistance to developing and lower developing countries. Japan is closely interdependent with developing countries since it is able to secure natural resources only through trade with those countries. Therefore, it is essential to maintain friendly relations with developing countries for Japan's economic growth (MOFA 1978).

In 1980's Japan's economic cooperation and DA had been guided by two motives—'humanitarian and moral considerations' and 'the recognition of interdependence among nations' (MOFA 1980). The policy was based on Japan's own experience and conditions³ combined with aid rationale commonly held by donor countries. For Japan, in principle, ODA is a cost for building an international environment to secure Japan's comprehensive security. Since the early 1990s, Japan's policy on economic aid has been guided by recipient countries efforts for promoting democracy, introduction of a market-economy, and securing of basic human rights and freedoms. Further, the ODA policy included environmental consideration, and support for self-help efforts of recipient countries.

The recent ODA Charter categorised measures for providing more efficient and effective ODA into three parts: 'system for formulation and implementation of ODA policy,' 'increasing public participation,' and 'requirements for implementation of strategic and effective assistance.' The system for formulation and implementation of ODA policy includes formulation of consistent aid policy, partnership between the government and implementing organisations, strengthening policy dialogue, strengthening functions at the field level, partnership with various actors like NGOs, private business, universities and local government, international organisations, etc. Increasing public participation considers the importance of promoting public understanding and support, direct participation in

³Such as having a peace Constitution, being an economic power, economically highly dependent on other countries, having accomplished modernization and a non-Western country

assistance to developing countries by the Japanese Overseas Cooperation Volunteers (JOCV) and senior volunteers (SV), NGO assistance and participation in activities, human resource development and research in the area of development, development education, etc. The requirements for implementation of strategic and effective assistance consists strategic aid implementation, effective aid implementation, ensuring appropriate procedures, securing the safety of personnel engaged in DA etc. (MOFA 2012).

Over the years, Japan's ODA policy has

- emphasised private sector business activities compared to government initiatives;
- strengthened ties with the private sector to achieve common diplomatic objectives;
- participate actively in business networks linking East Asia with India;
- diversify Japan-India trade and investment;
- share the latest intellectual resources for infrastructure development;
- promote meaningful policy dialogue and mutual understanding through outcome-oriented trade missions;
- increase human interaction, especially by offering more employment opportunities to India's skilled human resources in Japan; and
- cooperated with India on the procedural use of nuclear energy.

In recent years, Japan is using ODA as an instrument of one of its key diplomatic tools. For financial year 2013, the country targeted three major objectives- to realise a prosperous and stable international community with freedom; to support the growth of the emerging and developing economies together with the growth of the Japanese economy; and to promote human security and strengthen trust in Japan. Subsequently Japan planned to assist to countries which share universal values and strategic interests with Japan, contribute to international counterterrorism efforts, support for efforts towards democratisation, support for development of legal institutions and regulatory frameworks, assistance based on the Comprehensive Partnership with Middle East and North Africa for stability and prosperity. The objective of ODA has been to support emerging/ developing economies to grow together with Japan, focus on the development of legal and regulatory institutions and standards in developing countries through human resource development and technical transfers. Projects that facilitate development of natural resources and energy are also promoted. It also aspires to promote PPP.

Under its human security objective, Japan has tried to strengthen cooperation with NGOs, address the environmental and climate change issues/disaster risk management, and contribute to achieving the Millennium Development Goals (MDGs) and the post-2015

development agenda. It has also tried to implement its Strategy on Global Health Diplomacy, and promote human security in Africa and other poor regions, and also gender mainstreaming and assistance to the island countries. Also, the quality aspect of ODA has been well pondered over in the form of expanding partnerships to the players outside the government and JICA, which include NGOs, small and medium enterprises (SMEs) and other private companies, local governments and universities, by using their advanced technologies and knowhow in overall ODA activities (MOFA).

The key feature of Japanese ODA is that it focuses on development of industry-related infrastructures, which reduces the trade and transaction cost and attracts investment from both foreign and domestic investors. This distinctive Japanese model of development assistance is based on the country's own history and experience. This model translates into particular principles for aid, as well as choices on modalities, thematic and geographic areas of work, and partners, which distinguish Japan from mainstream donor trends within the OECD DAC framework (Rocha Menocal *et al.* 2011; Wild *et al.* 2011). As Yanagihara (1998) argued, the Japanese approach to development may be characterised as an 'ingredients approach', focused on field-level engagement and supporting the relevant institutions that can realise change at the local level.⁴ This is in contrast to the 'framework approach' of other DAC members, which is more focused on high-level (or upstream) policy frameworks (GRIPS 2008).

India's recent development strategy has a focus on faster growth, employment generation, inclusive and environmentally sustainable growth. JICA's cooperation strategy for India centres around stable energy supply, improvement of transportation networks, employment generation, income generation in rural areas, improvement of basic social services, conservation and improvement of urban environment, and environmental conservation. The JICA's strategy coincides well with the development strategy of India. As India's economic growth is being driven by the private sector, Japan is making its efforts to involve Japanese corporations in the infrastructure and other development projects supported by ODA. Often, it is suggested that India has reached a stage where it must move away from dependence on ODA, and new cooperative arrangements and competitive relations should be established within the private sector. Therefore, the major challenge now facing the Japanese government is to determine how best to combine the efforts of its various organisations and

⁴However the counter argument for the Japanese ODA is that the country does not engage directly in the assistance of grant for poverty reduction as other donor countries are practicing. The existing literature points out that the aid from other donor hinges on reinforcing pro-poor policy and self-help grass-roots assistance programmes towards succeeding in their poverty emancipation targets. The OECD Development Assistance Committee (DAC) peer review committee voiced the criticism that Japan chiefly built roads and bridges, but did little to empower communities and reduce poverty.

assistance programmes with the promotion of opportunities for Japanese corporations to expand their operations into India.⁵

4. Japan's ODA to India: Trends and Pattern

Japanese ODA in Asia targeted to serve as an instrument of fostering economic and political security in Asia. Inclusive growth through supporting infrastructure and human resource development has been the priority for Japanese ODA. ODA has also been instrumental in facilitating private sector investment and trade through large-scale projects lending. Recently, these economic cooperation relationships are being institutionalised. Therefore, Japan has been signing Economic Partnership Agreements (CEPs) with many Asian countries. Though South Asia and India have been receiving Japan's ODA for long time, India has emerged as priority in Japan's ODA radar more recently and there are big programmes underway. It was argued that the developments in the bilateral relations in all fronts suggest that in the coming decade, India-Japan bilateral ties will play a critical role in stabilising the emergence of the new Asian order, in which India, Japan and China can be responsible stakeholders (Panda 2010).

Recent literature highlights that India receives the largest share of Japanese ODA in Asian countries. To mitigate traffic congestion and promote regional economic growth through environmental conservation measures, transport sector has remained the focus. From 2002-2011, the transport sector received 25 per cent of JICA's total assistance to India. Within this sector, metros accounts for the largest share (77 per cent), followed by railways (12 per cent), roads (10 per cent), and ports (1 per cent). JICA has been supporting construction of metros in Delhi, Bangalore, Kolkata and Chennai. In the past, JICA has supported widening and strengthening of number of national highways in line with National Highway Development Programme (NHDP). Furthermore, development of urban road network has been promoted by constructing ring roads and introducing Intelligent Transport System (ITS) for Hyderabad city. In the railway sector, the Indian government has started work on Dedicated Freight Corridor Project. JICA is supporting the construction of western corridor between Delhi and Mumbai. JICA is also promoting development of the Delhi-Mumbai Industrial Corridor (DMIC) through assistance for infrastructure development such as railways, roads and ports to attract foreign investments in India. Energy shortage is one of the major impediments to India's economic growth. JICA supports India's efforts towards achieving dynamic growth and lowering Green House Gas (GHG) emissions through various initiatives such as high efficiency thermal power plants, improvement of existing power plants, IT

⁵ The Policy Council the Japan Forum on International Relations (2007). The 29th Policy Recommendations. India's Leap Forward and Japan.

enabled distribution networks, renewable energy and energy conservation on the consumers' side, etc. A large portion of JICA assistance in the energy sector is dedicated to the strengthening of power supply capacity, by using upgraded and more efficient technology power plants, transmission systems and distribution networks.⁶

In the late 1990s, it was highlighted that Japan has provided highest ODA to Asian region. In terms of salient features of Japanese ODA, high proportion of loans has been observed. Besides, the Japanese ODA is generally untied to the purchases of goods or services from domestic suppliers.⁷ On the sectoral front, the Japanese government has tended to stress the economic rather than the social needs of recipients. A large share of Japanese aid is earmarked for construction of physical infrastructure, such as seaports, airports, roads, railroads, subways, power plants, and communication facilities.⁸ Fujisaki et al. (1996-97) argued that the large-scale physical projects—funded predominantly by loans have been favoured by the Japanese bureaucracies as a means of disbursing ODA quickly amidst the lack of adequate human resources to implement assistance in soft areas. There was much dominance of government in providing grants compared to NGO's.⁹ This dominance of the government has been challenged on the ground that governments contracted to large consulting firms, with little grassroots participation by Japanese NGOs and individuals, or by members of local civil society in the recipient countries.¹⁰

⁶JICA Operations and Activities in India. Japan International Cooperation Agency.

⁷In 1980, only 25.8 per cent of Japanese ODA was untied, one of the lowest among the DAC members. As a result of the MOFA's conscious effort, the share of untied aid rose rapidly in the 1980s, and became the highest among the top donors. In 1999, 96.4 per cent of Japan's total bilateral ODA commitments was untied (an additional 2.9 per cent was partially untied), whereas the untied ratio was 84.7 per cent for Germany and 91.8 per cent for the United Kingdom.

⁸In 1999, the share of economic infrastructure in Japan's bilateral ODA was 32 per cent, compared with 13 per cent for the United States and 12 per cent for the United Kingdom.

⁹According to DAC data for 1997, the share of NGO-participated grants was only 2 per cent of total ODA in Japan, while the share was much higher in other major DAC countries, such as the United States (37 per cent), Germany (16 per cent) and the United Kingdom (9 per cent). Reflecting the large absolute size of Japanese ODA, however, the value of NGO-participated grants in Japan (\$223 million) was the fourth largest.

¹⁰Masahiro Kawai and Shinji Takagi (2001). Japan's Official Development Assistance: Recent Issues And Future Directions. [Policy Research Working Paper Series](#) 2722, The World Bank.

Trends of Official DA (ODA): Japan has been extending bilateral loan and grant assistance to India since 1958. Japanese bilateral loan, grant aid and technical cooperation assistance to India is received through JICA. Figure 2 reports composition of Japanese ODA to India, which has heavily in favour of loans compared to the other two components. India has been the largest recipient of Japanese ODA since 2003-04. As on July 10 2013, 67 projects are under implementation with Japanese loan assistance. The loan amount committed for these projects is Yen 1654.324 billion (about Rs. 86555 Crores). Cumulative Japanese ODA loan commitment to India as on May 31 2013 was JPY 3909.65 billion. These projects are related to infrastructure sectors like power, road and highways, shipping, bridges, water supply and sanitation, urban transport, environment & forest, health, human resource development, natural disaster, etc.

It is not only Japanese official DA which has been increased. There is a huge spurt in the overall DA being given by OECD's DAC. For instance, ODA to all countries from OECD increased from 27 billion US\$ to nearly 133 billion US\$ in 2011. A close look at the recipients of ODA shows that in Asia, the largest beneficiaries have been Afghanistan, Pakistan and Vietnam followed by India. Interesting, the percentage shares of recipient countries in the OECD's ODA to Asia shows a few interesting trends. For instance, the share of Asia in the ODA of OECD has in fact declined from 22.70 per cent in 1981-85 to 17.59 per cent in 2011 which is in complete contrast to the absolute figures. In percentage terms, even the share of India in OECD's ODA to Asia has declined from 10.85 per cent during 1981-85 to 8.64 per cent in 2011. However, the shares of Pakistan, Vietnam and Iraq have increased. (See table 4 and 5 for details) of DAC's ODA. Further, India's share in OECD's ODA to Asia has declined leading to a decline in the share of India in DAC's total ODA. For instance, the share of India in DAC's total ODA assistance has declined from 2.45 per cent in 1981-85 to 0.80 during 2001-05 and dipped to 1.52 per cent in 2011. But the interesting statistic is that Japan's ODA to India as a percentage of DAC's ODA to India has improved significantly from 6.82 per cent during 1981-85 to 39.09 per cent in 2011 (table 6 and figure-3)

Table 7 (also figure-4) shows Japan's ODA to Asia and Asian countries during 1981 -85 to 2011. There has been an increase in the overall of ODA of Japan to all recipients and Asia is no exception. The ODA to Asia from Japan increased to 2432 US\$ million on 2011 from 1685 US\$ million during 1981-85. In fact, Japan's ODA to most of the countries in Asia including Vietnam, India, Afghanistan, Pakistan, Iraq, Sri Lanka and Cambodia has gone up significantly during 1981-85 to 2011. The ODA to India increased to US\$ 796 million from a mere US\$ 46 million during 1981-85. However, the percentage figures with respect to Japan's ODA to Asia have declined. For instance, the share of Asia in Japan's ODA has declined to 22.46 per cent in 2011 from a whopping 47.49 per cent during 1981-85. This is in

complete contrast to the absolute figures. However, continuing with the trend seen in the absolute numbers, the shares of India, Afghanistan, Pakistan and all the other countries in Japan's ODA have gone up. For instance, the share of India in Japan's ODA increased to 32.74 per cent in 2011 from a negligible 0.05 percentage share during 1981-85 (see table 8 for details).

Another interesting aspect of Japanese ODA to India is the difference between the commitment and actual disbursements of the ODA loan during 2008-09 to 2013-14. For instance, the ODA commitment to India in 2008-09 was 236 billion yen but the actual disbursement stood at only 122 billion yen. In 2012-13 also the commitment was higher than the actual amount of assistance disbursed. The trend continues in 2014 as well. This also brings out the need to bridge the gap between the commitment and disbursement of loans to ensure better efficiency of Japanese ODA to India (Table 10). However, Japan's ODA to India as a percentage of Japan's total ODA to Asia has increased over years (figure-5). Figure-6 reports the loan commitment to India in last years. Though there is sudden fall in loan commitment in the 2010-11 due to earthquake disaster in Japan, the commitment revived as the loan commitment postponed to the post-disaster years.

JICA has signed numerous major projects related to the infrastructure development in India. These include Dedicated Freight Corridor, DMIC, Metro project in Chennai, Chennai-Bengaluru Industrial Corridor, Piped Water Project in Purulia district in West Bengal, etc. The broader objective of these projects was to develop a smooth infrastructure to ease the pressure on the growing population.¹¹The West Bengal Piped Water Supply Project (Purulia) is expected to provide water supply facilities for safe and adequate drinking water in Purulia District, State of West Bengal where there is chronic water deficiency and fluoride contamination issue of the ground water.

The DMIC is an integrated regional development project for promoting direct investment in India by Japanese and other companies as well as Indian exports. It will be the largest industrial corridor in India, connecting industrial complexes and harbours in six states from the capital of Delhi to the industrial city of Mumbai with dedicated freight rail and roads. The base of the DMIC framework is the Dedicated Freight Corridor Project (DFC) which will construct dedicated freight rail between Delhi and Mumbai (total projected expenses: approximately 900 billion yen). The Special Terms for Economic Partnership (STEP), for encouraging the technical transfer of advanced Japanese technology and knowledge to

¹¹Ishan Srivastava (March 30 2013). Japan International Cooperation Agency extends loan of Rs 11, 400 crore for infrastructure projects in India. *The Times of India*.

developing countries, apply to this project. The Chennai Metro Project (III) will construct a mass rapid transit system in Chennai.¹²

As India experiences rapid urban development, the number of registered automobiles and bicycles has quickly risen where as the public transportation has failed to keep pace with the growing needs of urban development. In particular, traffic congestion accompanying an increased demand for road transportation has become a serious issue in large cities such as Delhi and Mumbai, and the resulting economic loss and the detrimental health effects due to air pollution, noise and other automobile pollution are becoming more serious. A public transportation system therefore must be built to alleviate the traffic congestion and improve the urban environment. On September 17th, the JICA signed a Japanese ODA loan agreement with the Government of India in New Delhi to provide up to 71 billion yen for assistance for the Mumbai Metro Line 3 Project to construct India's first fully underground metro line. Under the project, a mass rapid transit system will be constructed in Mumbai, the capital city of Maharashtra State. This transportation system will meet an increasing transportation demand, and the project aims to develop regional economy and improve the urban environment. The loan funds will be allocated to civil works, electrical and communication-related construction, rolling stock procurement and consulting services. The projects cited above are select ones; there are many more projects related to the enhancement of infrastructure and rural development. But the present infrastructure need of the country invites attention in the following areas for further development.

Sector-wise Japanese ODA to India and Major Completed and On-going Projects: It is evident from the analysis above that there has been a significant increase in Japan's ODA to all countries over the years including India. Table 10 presents the sector-wise Japan's ODA to all recipients. The sector-wise analysis of Japanese ODA reveals that the share of economic infrastructure and services increased from 24.81 per cent during 1971-7 to nearly 34.60 per cent during 2006-11. Comparatively, the share of social infrastructure and services in Japanese ODA has been low. The share of social infrastructure and services in Japanese's ODA to all countries stood at 23.75 during 2006-11 less than economic infrastructure but shows an increasing trend. Within Economic infrastructure and services, transport commands the largest share followed by energy.

Similar trends of table 10 can also be observed in Table 11 which shows Japan's ODA assistance to India sector-wise. In absolute figures, the share of Japan's ODA to economic infrastructure and services increased from US\$ 320 million in 2005 to US\$ 1097 million in

¹²Embassy of India, Tokyo Japan

2011. However, ODA to social infrastructure and services marginally declined to US\$ 424 million in 2011 from US\$ 497 million in 2005. The percentage shares also fall in line with the trend in absolute numbers. For instance, the share of economic infrastructure and services increased to 48 per cent from 25 per cent in 2005. Similarly, the share of social infrastructure declined to 18 per cent from 39 per cent in 2005. This also reflects the growing need and demand for Japanese ODA in economic and physical infrastructure as compared to social infrastructure. In fact, the ODA to education, water supply and sanitation has declined significantly and the share of ODA to energy, transportation, industry and mining has gone up significantly (see Table 12 for details). Similar trend has been observed in terms of Japan's ODA to India in different sectors as share in Japan's total ODA in respective sectors (table-13). However, in percentage terms the share of Japanese ODA in social infrastructure and services overall and to India in particular has shown a decline. For instance, in the total ODA disbursement to social infrastructure by Japan, the share of India declined from 14.48 per cent in 2005 to 11.11 per cent in 2011. However, with social infrastructure and services, the share of education ODA to India declined where as there was a marginal increase in ODA in the water supply and sanitation, which increased from 22.71 per cent in 2005 to 24.12 per cent in 2011. Further, in the total Japan's ODA to economic infrastructure and services, the share of India increased from 7.92 per cent in 2005 to 16.98 per cent in 2011. There were significant improvement in shares of both transport and communication and also energy. In Japan's total ODA to the production sectors, there is a whopping increase in India's share especially in industry, mining and construction and also trade and tourism. For instance, the share of India in the total industry and mining ODA of Japan increased to a whopping 55.49 per cent in 2011 as compared to 1.48 per cent in 2005. The same is the case with agriculture, forestry and mining. However, in sharp contrast, the share of India in Japan's ODA to the trade and tourism declined from 61.83 per cent in 2005 to 0.05 per cent in 2011.

In sum, the trends in Japan's ODA reveal that Japan's ODA to all countries has increased especially in Asia and India commands a significant share in the total of Japan's ODA. Also, a large part of Japanese ODA goes to economic infrastructure and services and the share of India in that as well is significantly high.

In the early 1990s, the priority areas of Japan's ODA strategy for India were focused towards economic infrastructure development, particularly for power and transport infrastructure.¹³ Later, in 1999/2000, implementation policy for JICA's overseas economic cooperation focused on assistance in the poverty sector, the environmental sector, and in economic and social infrastructure development for sustainable economic development. In the current

¹³The Ministry of Foreign Affairs.' Japan's ODA White Paper' (1998).

Country Assistance Programme for India formulated by the Government of Japan in 2006/07 there is also an emphasis on economic infrastructure development, of which power sector is the highest priority along with transportation sector.

The significance of Japanese ODA and especially the role of JICA in promoting infrastructure development in India is commendable. In fact, the infrastructure development in the country in the last decade has been largely due to the contribution of Japan's ODA through JICA. JICA has funded several projects and given ODA in the last one decade. For instance, in the financial year 2012-13 also JICA committed to fund through ODA several projects a few of which include Delhi water supply improvement project with a loan of Rs. 1704 crores, DFC project phase II with a budget of Rs. 9585 crores, Tamil Nadu transmission systems project amounting to Rs. 3572 crores etc. In total, the ODA of JICA to major projects in 2012-13 stood at a high figure of Rs. 23, 719 crores. (See table 14 for details).

Table 15 shows the list of JICA assisted projects under implementation. These include the DFC project phase 2 with a share of 8.23 per cent in the total disbursement of ODA for projects in India, Delhi Mass Rapid Transport System Project phase 3 with a share of 7.73 per cent located in central Delhi, Chennai metro project with a share of 3.62 per cent etc. In the total ODA given by JICA to projects being implemented in India, the share of top 15 sectors/projects stood at 55 per cent with the loan amount of 908500 million yen. However, the total loan amount for all projects stood at 1654324 million yen. Similarly, many of the projects funded by JICA as a part of Japan's ODA have not only been successfully completed but are also performing well. Some of these include Dhauliganga Hydroelectric Power Plant Construction project in electric power sector with a disbursed loan amount of 4976 million yen, Punjab afforestation project with a loan of 4809 million yen, Manipur sericulture project with a loan amount of 3941 million yen etc. Table-16 reports the successful mega projects completed with the help of Japanese ODA between the period 1995-2003. It is evident from the trends in the ODA assistance of Japan through JICA that there can be no substitute for Japan's contribution to India's infrastructure development. In fact, the entire credit for India's development in the economic infrastructure and services front goes to JICA and Japan.

5. Contribution of Japanese ODA in India

The Japanese ODA has contributed profoundly to the economic development of Asian countries. The contribution of its ODA is described in several dimensions:

- Approximately 60 per cent of Japan's ODA has been directed to Asian countries, and a large part of it was allocated to the development of economic infrastructure, which

helped improve the environment for investment for foreign investors and utilise the vitality of the private sector.

- These aid projects were well timed to invite foreign direct investment to Asian countries and promote the development of their export industries.
- Increases in agricultural production have bolstered the economic development of East Asian countries, and Japan has extended large-scale aid projects in various forms for the development of their agriculture sector.
- In the area of human resources development, which is one of the key ingredients underpinning the economic development of East Asian countries, Japan has put emphasis on aid for human resources development since the 1970s, and has extended active assistance for training their engineers and other technical personnel.

The improved economic infrastructure in East Asia financed by ODA loans from Japan in early nineties has helped attract foreign direct investment from various countries, helping the Asian countries achieve steady economic growth in recent years. Japan's economic cooperation in the area of economic infrastructure and human resource development combined with its grant aid for the development of social infrastructure (education, public health, and sanitation), has generated multiplier effects to improve the living standard of local communities and narrow the regional disparity among and within East Asian countries. In case of Indonesia, Japan's ODA loans financed the construction of power stations which generate 15 per cent (1,994mw) of the nation's total power output, the construction and renovation of 12 per cent (799km) of its railway systems, the construction of 15 per cent (56km) of its toll roads, the construction of 60 per cent of the intra-city communication transmission cable conduit system of Jakarta, and the construction of 54 per cent of the city's water filtration facilities (9,600t/s). In addition, Japan has been implementing various aid projects for human resources development that constitutes the very foundation of economic growth¹⁴. Japan's has made great efforts to support Asian countries' human resources development. There are some recipient countries of Japan's ODA such as South Korea and Singapore which have achieved remarkable economic development. They are now graduating from Japan's ODA, and are starting economic aid to other developing countries on their own

¹⁴Up to 1993, Japan has accepted the total of 69,959 trainees from Asian countries, dispatched the total of 23,045 experts and 55,328 aid personnel in assistance missions to these countries (57.8%, 59.3%, and 57.6% of the total respectively)

or jointly with Japan.¹⁵Blaise, (2009) finds that Japanese aid flows to east and south East Asian countries did have a significant impact on investment and growth in the region.

Contribution of Japanese ODA in India¹⁶: Few Case Studies

The contribution of Japanese assistance has been multi-fold. A brief review of the contribution Japan in a few sectors and projects supported by Japanese ODA is given below.

Energy Sector: Japan has steadily supported the development of power sector in certain states such as Andhra Pradesh and West Bengal, where Japan has played a major role in setting up electrical power plants. As a result, the states of Andhra Pradesh and West Bengal are among those that have achieved the most dramatic economic growth. Because more industries are setting base in these states, the demand for power is rising. Supporting the power sector has significantly contributed to meeting the increased demand for power and also further economic growth in these states and, consequently, led to investment interest in these states. Tamil Nadu Transmission System Project set up with the help of Japanese ODA largely fulfils the e energy demand in the country.

Transport Sector: Another project that has transformed the transport sector in the country is the Delhi Mass Rapid Transport System Project. A study conducted by the Delhi Metro Rail Corporation found that approximately 16 per cent of Delhi Metro passengers formerly commuted to work or school by private automobiles, etc shifted to Delhi metro. This certainly has eased traffic congestion and therefore improved the city's environment. Based on the experience and expertise gained from the Delhi Mass Rapid Transport System Project, mass rapid transport systems are currently being planned in Chennai and Bangalore. In fact, the first phase of the Bangalore metro project is complete and has commenced operations since 2012. From this perspective, Japan's yen loan projects have had a significant effect, since one project can have a ripple effect in other regions. In recent times, projects like Bangalore Metro Rail Project Central–Karnataka, Hyderabad Outer Ring Road Project Phase 1 & 2, Andhra Pradesh are good examples of best delivery of transport facility in the selected states.

Infrastructure Assistance: Japan's Country Assistance Programme for India contains the following: 'When implementing infrastructure development, it is more effective to implement not only 'hard' aspects of assistance, such as facilities development, but also to combine it with 'soft' cooperation with human resources development at its core, improving

¹⁵MOFA (1994).Japan's ODA Annual Report (Summary) 1994. Ministry of Foreign Affairs

¹⁶The Ministry of Foreign Affairs of Japan (2010).Country Assistance Evaluation of India, Summary.

the operation and maintenance capacity and management capacity of project implementation agencies, and further policies and systems in order to increase the effect of projects.' In accordance with this policy, yen loans in recent years have been provided not only for the construction of infrastructure but also for human development and capacity development of the implementing organisations. For example, in the case of the Bakreswar Thermal Power Station Construction Project, a training facility with a generator control room simulator was constructed for technical training of the power station staff. This facility is also used regularly for training the staff of power stations throughout India.

In the Delhi Mass Rapid Transport System Project, in addition to the Japanese technology used for subway construction, Japanese ideas of safety and efficiency were taught to the local staff, resulting in changes in the practices of Indian construction workers. Moreover, the Delhi Metro Rail Corporation uses the operation and management expertise accumulated in the course of the Delhi Mass Rapid Transport System Project for its consulting service, which it offers to mass rapid transport systems in other cities, thereby creating new capabilities across states in India and creating a new source of revenue for the corporation. This is another example of yen loans contributing to the capacity development of the implementing organisation and its leading role in similar projects in other regions. Recently signing for the projects like DMIC, DFC Project Phase II and Chennai Metro Project Phase- I, II and III are the landmark steps in the direction of improvement in the road infrastructure in India.

Health Sector: One major technical cooperation project in the health and sanitation sector is attempting to eradicate communicable diseases. From 1998 to 2003, Japan provided technical cooperation to the National Institute of Cholera and Enteric Diseases (NICED), which plays a central role in combating diarrhoea disorders in India. Japan has helped to combat acute diarrheal illness in India, which is a major factor contributing to the high infant mortality rate in India. Another major technical cooperation project in the health and sanitation sector had been the Madhya Pradesh Reproductive Health Project Phase I (2005-2006) and Phase II (2007-2011). In this project, by the request of the Government of India, Japanese assistance for technology transfers and human resources development has been provided in order to improve services relating to safe pregnancy and childbirth, particularly in the state of Madhya Pradesh, where demand is high. This project serves the objectives set in the National Rural Health Mission (NRHM), which has been promoted by the Government of India since 1995, and the Reproductive and Child Health Programme Phase II (RCH-2), which is a part of the NRHM. Japan's active technical cooperation in communicable disease eradication, reproductive health, and other projects is thought to have contributed to the improvement of India's health and sanitation at the grassroots level. Bangalore Water Supply and Sewerage (II) Karnataka, Rajasthan Rural Water supply and

Fluorosis Mitigation Project (Nagaur), Rajasthan, Kerala Water Supply Project (I & II) Kerala, Yamuna Action Plan Project (III) Central – Delhi, etc. are the recent initiatives which are being facilitated by Japan in India.

Local Development: The Sericulture Development project between 1991 and 2007 is one example of the assistance for local development that has increased the income level of rural farmers by improving productivity. In this project, specialists were sent from Japan to introduce Japanese bivoltine sericulture technology, such as improving methods for cultivating mulberry trees, improving silkworm varieties, and breeding silkworms, to improve the productivity of local sericulture farmers. Moreover, human resources development was achieved at the local level, since JICA specialists and local sericulture technology supervisors worked together closely for more than ten years. This long-term cooperation with the local government body is a good example of the importance of building close relationships with the federal and state governments, as well as with the implementing agencies at the local level. In addition, five projects for improving irrigation systems in rural areas, which is also one of the components for rural development, were funded through yen loans. Japan has also helped India in enhancing its capacity in forestry sector, water supply and sewage systems, renewable and energy saving particularly for SMEs, urban environments, human resources development and human exchanges, etc.

Impact of Japanese ODA Loan Dhauliganga Hydroelectric Power Plant Construction Project (I) (II) (III): Electricity demand in India showed rapid growth increasing at an annual average growth of 5.2 per cent since 1996. In response to this, the Indian Government began to concentrate on the effective utilisation of the generation facilities owned by the central government in each state, the rehabilitation and modernisation of existing power generation plants to secure energy production and to cope with peak demand, the development of new generation facilities with foreign assistance, and the improvement of transmission and distribution networks¹⁷. In this direction, Dhauliganga Hydroelectric Power Plant Construction Project has been set up in different phases. Under this project, the design energy was 1,134GWh per year, the estimated gross electric energy production of Dhauliganga Power Station exceeded that figure. As for net electric energy production, NHPC and JICA agreed to set 1,110 GWh per year as a target. Gross energy production almost reached the estimated amount, except in 2006/07 and 2008/09. Net energy production exceeded the estimated amount except for the above two years. As the

¹⁷ For example Against 19,240 MW at peak demand, the electricity supply remained at 12,455 MW (64.8%) in 1993. The electricity supply in the same year was 90,106 GWh against the required amount of 102,416 GW (a shortage of 12%).

projects have been supported by Japanese ODA, all necessary process have been followed which has observed following impacts:

Economic Development in the Northern Region: The electric energy produced at the Dhauliganga Power Station is supplied to the Bareilly 400 kV Substation. One of the two lines is connected to the Pithoragarh 220 kV Substation at a point 59 km from the power station, but as of December 2011, the substation had not yet started supplying electricity directly to the Pithoragarh District since the PGCIL had not completed the extension of transmission lines to reach the Pithoragarh 132 kV S/S from which the surrounding people should have received electric energy. The electric energy therefore goes through Bareilly S/S, Haldwani S/S and other substations to reach entire northern region including Pithoragarh. It is therefore difficult to identify particular beneficiaries. The impact on economic development such as employment creation and industrial development in the northern region has not been analyzed due to difficulties in measurement¹⁸. However, the share of the installed capacity of the Dhauliganga Power Station is negligible, and therefore the impact on fuel diversification for power generation in the northern region has been limited. As of March 2012, the installed capacity of hydro and thermal generation facilities accounted for 30 per cent and 60 per cent of the total capacity of the northern region.

Environmental Impact: Based on the Environmental Action Plan completed by NHPC in March 1995, NHPC implemented i) a compensatory afforestation scheme, ii) a catchment area treatment plan, and iii) a rehabilitation & resettlement plan.¹⁹ It was also pointed out that forest areas had rapidly increased in the catchment area and that soil erosion had been

¹⁸Though its difficult to direct infer but there is evidence of economic growth in the area. For example, the per capita net state domestic product (NSDP) of Uttarakhand, where the Dhauliganga Power Station is located, was 24,740 rupees, which was almost same as NNDP (24,143 rupees). This grew as much as 41,126 rupees in 2009/10, which far larger than NNDP (33,731 rupees).

¹⁹ (i) Compensatory Afforestation Scheme: Prior to project implementation, the Uttar Pradesh Social Forest Department implemented a 7.4 million rupee compensatory afforestation scheme in 140 ha of non-forest land during 1994 and 1996. Seedlings/saplings were provided by the department. (ii) Catchment Area Treatment Plan: 1,571 ha of plantation with 1.85 million of seedlings, soil conservation works, check-dams (1,940nos in total), agricultural terraces (370 ha), river training works, water detention tanks (167 nos), river bank protection (64 km in total) were planned and implemented by the Forest Department of Dehra Dun and implemented from 2001 to 2006, which at a cost of approximately 70 million rupees. Life improvement programmes, technical training in agriculture and free fuel supplies of LPG, diesel stoves, and electric heaters to replace firewood were also provided for local people living in upstream and in the area surrounding the dam, powerhouse and colonies. (iii) Rehabilitation and Resettlement Plan: NHPC improved the basic infrastructure required for a better living environment for local people, and it provided direct employment opportunities to members of the 37 fully affected families out of the total 581 project affected households.

mitigated. Such positive impact in the catchment area also had helped reduce the suspended load inflow into the reservoir consequently. Forestry activity has succeeded, and been integrated into the CSR programme for the Dhauliganga Power Station. Between 2007 and 2011, 32,000 flowering trees and fruit trees have been planted in around the upstream area and in the areas surrounding area of the dam, powerhouse and colonies from 2007 to 2011.

Water Quality: Various water quality tests have been conducted at different sites around the dam and power house area of the Dhauliganga Power Station. The test parameters are: temperature, conductivity, salinity, pH, turbidity, total etc. There have been no major problems in the water quality tests, and thus no negative impact has been observed.

Land Acquisition and Resettlement: The total land acquired for the project was 166.7 ha (138.6 ha of forestland and 28.15 ha of private owned land), and the submergence area was 28.6 ha. 581 families around the reservoir and dam site were affected in the execution of the project ('project affected households'), out of whom 37 were 'fully affected families for resettlement' (22 lost more than 50 per cent of their lands/houses and 15 became houseless). The proper cash compensation, job opportunities, house accommodation have been granted to the fully affected families by the executing agency of the project (NHPC). The remaining 545 project affected households were provided with compensation for their land and property through the Land Acquisition Officer of the District²⁰. The land acquisition and resettlement were executed as planned, and there was no delay or effect on the project design caused by social impacts. NHPC continued CSR activities after the construction was over, to sustain / promote further communication with project-affected people and other people in the local area. The other types of support include scholarships for children, eye camps, river bank improvement, blankets during wintertime and rice for poor villagers.

Impact on Local People in Downstream of the Dam: Several local surveys find a significant overall improvement in hygiene in their living environment, an increase in their income levels through new employment opportunities given to them, and improvements in their children's educational environment. This project has largely achieved its objectives; therefore, its effectiveness is high. However, there were constraints in evaluating to what extent this project contributed to the improvement of the electricity supply in the northern grid due to the fact that the installed capacity of this project made up less than 1 per cent of the total. Adverse impacts on natural and social environment have remained at a minimum through a series of actions implemented by the executing agency. There has been a positive

²⁰The total amount spent on compensation amounted to 66.99 million rupees (land: 29.5 million, houses: 17.4 million, fruit trees: 5.9 million, others: 13.19 million, and registration costs: 20,000 rupees).

impact such as improvements in the natural environment and in people's living conditions in the upstream area.

Ex-Post Evaluation of Japanese ODA Loan West Bengal Transmission System Project (I) (II):

This project was implemented to enhance the reliability of the transmission network system, to reduce transmission losses and voltage fluctuations, and to make intra-state electricity transmissions efficient through the provision of a competent electricity transmission network, the construction of new substations and the expansion of existing substations in West Bengal State. It has been highly relevant to India's development plan and development needs. Facilities provided under the project have been operated well, and the project has highly improved the reliability of the transmission network system, and has promoted reductions in transmission losses and in voltage fluctuation. The project has thus largely achieved its objectives, and its effectiveness is high. It is judged that the project has contributed directly and indirectly to industrial development, employment creation and the improvement of people's living standards in the State. The project cost was within the plan, although the project period exceeded the plan, therefore the project efficiency is fair. The project sustainability is deemed high in the organisational, technological and financial aspects, and the O&M condition of project facilities and equipment is good.

In the closely related projects, JICA has extended its ODA assistance loan to Bakreshwar Thermal Power Project²¹. According to information obtained from West Bengal State Electricity Distribution Company Ltd. WBSEDCL, the electricity supply in West Bengal State has improved to a large extent, and number of outages have sharply decreased in the past four years. In the State, approximately 5,000 consumers have contracts with WBSEDCL for over a 500 kVA contract demand. As on 2007/08 when unbundling took place, the transmission loss was 4.0 per cent in the transmission network of WBSETCL. This has shown improvement year after year reaching 3.8 per cent in 2009/10, and around 3.5 per cent in 2012/13. This shows that West Bengal State has been doing better compared to the average for the whole country which is around 5 to 5.5 per cent. Apart from transmission loss,

²¹Bakreshwar Thermal Power Project (I) (approved amount: 27,069 million yen, approved date: 1993/94), Bakreshwar Thermal Power Project (II) (34,151 million yen 1997/98), Bakreshwar Thermal Power Station Unit 3 Extension Project (I) (8,659 million yen 1994/95), Bakreshwar Thermal Power Station Unit 3 Extension Project (II) (11,537 million yen 1998/99), Bakreshwar Thermal Power Station Units Extension Project (36,771 million yen 2002/03). JICA also extended ODA assistance loans to the engineering service for the Purulia Pumped Storage Project in FY 1987 (approved amount: JPY 628 mil), PPSP (I) in FY 1994 (JPY 20,520 mil), PPSP (II) in FY 2003 (JPY 23,578 mil), and PPSP (III) in FY2005 (JPY 17,963 mil).

distribution loss in the State also improved from 24.6 per cent in 2007/08 to 24.3 per cent in 2009/10, and this is projected to improve further up to 22.0 per cent in 2012/13. However, there remains much to improve, such as technical and non-technical losses, unauthorised connection and power theft.

Contribution to Industrial Development: The net state domestic product (NSDP) of West Bengal State has shown an annual steady growth from 1,900,730 million rupees in 2004/05 to 3,663,180 million rupees in 2009/10. Energy consumption in the State also increased during the same period in line with NSDP from 9,581 GWh to 15,497 GWh. Energy consumption by industrial consumers increased from 3,581 GWh to 5,995.3 GWh, and that of domestic consumers from 3,128 GWh to 4,595 GWh. It is considered that this project has contributed to sustainment of the energy consumption required by rapidly increasing consumers while the State has seen industrial development through the improvement of the transmission network system, including the construction and augmentation of 31 substations.

People's Living Standards through Rural Electrification and the Promotion of Home Appliances: The Ministry of Power started rural electrification by launching *Rajiv Gandhi Grameen Vidhyutikaran Yojana* (RGGVY) in April 2005, targeting the completion of rural electrification within four years. As on March 2009, the rural electrification rate in West Bengal State was 97.3 per cent — a remarkable outcome achieved by implementation of the programme. This project did not intervene directly in rural electrification as it extended its finance up to 132 kV bay level transmission lines. This meant that the evaluators had difficulty in identifying any impact brought by the project to rural electrification and the promotion of home appliances. However, it is noteworthy that the census conducted in 2011 indicated a large population increase from 80.17 million in 2001 to 91.35 million in 2011, and that the number of domestic consumers increased from 3,128 GWh in 2004/05 to 4,959 GWh in 2009/10. Energy consumption for public lighting, public water works, irrigation and railway traction is also on the increase. This project has contributed a great extent to the utilisation of infrastructure necessary for people's lives and to improvements in their living environment. There was no major negative impact on the natural environment by this project. No land was acquired for the extension of transmission lines, while WBSETCL provided cash compensation for agricultural products, trees and so on which were affected by the right of way (ROW), based on Indian laws and regulations. There was 109 ha area of private land acquired for the construction of substations, for which the State Government of West Bengal took responsibility. There were no forests acquired, and no involuntary resettlement occurred for the construction of substations.

Ex-Post Evaluation on Japanese ODA Loan Simhadri and Vizag Transmission System Project (I)(II): The objective of this project was to reduce transmission loss and voltage fluctuation resulting from generation capacity additions in Andhra Pradesh (AP) State as well as to improve the reliability of the transmission system in areas where cyclones frequently occur. This was to be achieved by the construction of 400kV/220kV transmission lines between Simhadri Thermal Plant (1,000MW) and Vizag Thermal Power Plant (1,040MW) in Visakhapatnam and Hyderabad with substations (SS), thereby contributing to the expansion of industrial activity, employment, electrification in rural areas, and improvement of the living standards of the local populations.

Electricity Output: The major outputs of this project were: the new construction of two substations (Vizag/Kalpaka Substation (SS)9 and Dairy Farm SS), the expansion of the existing six substations (Pendurthi SS, Gazuwaka SS, Vemagiri SS, Nunna SS, Khammam SS, Hyderabad SS), and the new construction of 400kV transmission lines (877km) and 220kV transmission lines (74km).

AP State has promoted the development of electric power resources for the mitigation of constant power shortages. The total installed power generation capacity of AP State increased 2.2 times from 6,764MW (1997) to 15,003MW (2011) and the annual generated electrical energy increased 2.3 times from 33,130 GWh/year (1997) to 77,764GWh/year (2011) during the 14 year period between 1997 and 2011. At the same time, the number of electricity subscribers increased 2.4 times from 9.48 million in 1997 to 22.95 million in 2011. The electricity consumption per capita expanded from 600kWh in 2006 to 950kWh. However, it was pointed out that the electricity demand and supply gap in AP State had not been mitigated except for the three years from 2004 and 2006, soon after the completion of the Simhadri Thermal Power Plant in 2004. In addition, as of December 2011, Simhadri Thermal Power Plant shared 10 per cent of the total installed power generation capacity in AP State.

Transmission and distribution loss in AP State declined from 33 per cent in 1997 to 17.5 per cent in 2011. Transmission loss halved from 8.9 per cent in 2001 to 4.5 per cent in 2011. In comparison to the Indian national average the figure stood 27 per cent in 2011. Now, AP State is counted as one of the States with the lowest transmission loss in India.

Economic Development, Employment and Other Impacts of the Project: After implementation of the project, Transmission Corporation of Andhra Pradesh Ltd (APTRANSCO) improved capacity to provide a stable electricity supply, minimising load shedding and voltage fluctuation. The Gross State Domestic Product of AP State increased

1.7 times from 2,247 billion Rupees in 2005 to 3,710 billion Rupees in 2011. In recent years the development of industrial estates has taken place in the state and the number of large-scale industries such as textile, pharmaceutical, and machinery manufacturing industries is increasing. The number of enterprises is also expanding. According to interviews with the power distribution companies in AP State, it was recognised that the project has contributed to the promotion of industrial development in AP State through the stable electricity supply from Simhadri Thermal Power Plan to the power-consuming areas. In the due process, the expansion of employment opportunities in AP State has been observed under the relatively sound industrial development. The project has a positive effect on the stability of the transmission system in AP State, and thus it can be said that the project has contributed to an improvement in people's living standards to some extent. The process for obtaining forest clearance was followed appropriately, and no negative impact on the natural environment from the project has been observed. The land acquisition process also met the requirements of Indian law and regulations.

6. Japan's ODA to India: Future Areas of Cooperation

Japan's ODA to developing countries, particularly India, has been unique in the sense that it helped augment and supplement the recipient country's infrastructure development. Japan has gradually shifted the ODA from electricity projects in power sector to transport infrastructure. Learning from experience, Japan may contribute significantly to the growing demand of India in terms of energy and other infrastructure requirements in order to sustain high long term economic growth. Japan's support to India in terms of capital, technology and human resource development can help India to explore and use its natural resources to the best use. The broader areas for Japan's future priority include assistance for tackling environment issues and climate change, assistance for economic growth along with employment generation, promotion of sustainable economic growth through assisting with infrastructure development, reduction of poverty and boosting the health and education utilities in India. Some areas that offer Japan opportunities to help India through its ODA in the future are listed below.

Infrastructure Development: Infrastructure development continues to be the most important sector in India needing Japanese ODA. One of the crucial sectors for India's development is transport infrastructure, which includes road, rail, port and airport infrastructure. For example, India is projected to achieve a nearly six-fold increase in passenger vehicle stocks, from 16.7 million units in 2010 to 117.8 million units in 2035. This growth would be led by conventional gasoline-powered vehicles and diesel-powered vehicles. Meanwhile, with the rise in income levels, and increased public awareness about

environment and need for fuel economy improvements, hybrid vehicles are projected to make inroads into India's market, reaching 19.1 million units (hybrid gasoline) and 6.0 million units (hybrid diesel) in 2035. The increased volume of vehicles can pose the problem of congested traffic and high pollution needing further expansion of environmentally friendly rail and road projects. In the due course, the setting up of metro rail projects in other metros Chennai, Calcutta and Mumbai will be the priority. Japan has assisted India in managing the traffic congestion, environment protection, electricity supply under the ODA. On the energy requirement front, South Asia's requirements are the second largest at \$2.4 trillion (or 20.6 per cent of total investment requirements in Asia and the Pacific). India will account for an estimated \$2.3 trillion or 95.6 per cent of energy investment requirements in South Asia. Japanese assistance in this context may provide a helping hand to India to meet its investment requirement and technological efficiency. The core competence of Japanese firms in handling the road and rail development could help the development of projects in this sector further. Moreover, modernisation of India's ports to improve efficiency and to meet the increasing demand for port infrastructure is another area where Japanese ODA could play a significant role.

Energy: As per the ADB prediction, South Asia's Total Primary Energy Demand (TPED) is projected to increase from 745.5 MT in 2010 to 1,558.6 MT in 2035, growing at an annual rate of 3.0 per cent. This region's growth trend is much affected by India's TPED growth trends as it accounts for a bulk of the region's TPED (around 92.1 per cent over the outlook period). Population growth, industrialisation, and improved energy access drive the energy demand growth. In the business-as-usual case, the final energy demand of India is projected to increase at an annual rate of 2.7 per cent from 2010 to 2035, with a slower projected GDP growth rate of 5.7 per cent during the same period. By sector, the share of the other sectors (including residential, commercial, agriculture, and fishery), which was the largest accounting for 46.3 per cent in 2010, will moderately increase at 2.2 per cent as a whole to decrease to 41.1 per cent of final energy demand in 2035. In contrast, transport energy demand will increase at 4.7 per cent per year over the outlook period. Industry energy demand will increase at 2.4 per cent per year through 2035, and its share will remain around 30 per cent.

India is exploring new means of fulfilling the demand supply gap by diversifying its energy mixes with the help of renewable energy and nuclear power. The Department of Atomic Energy, India, plans to put up a total installed nuclear power capacity of 20,000 MW by 2020. In 2012, seven nuclear reactors (5.3 GW) were under construction.²² This situation

²²ADB (October 2013). Energy Outlook for Asia and the Pacific. Mandaluyong City, Philippines: Asian Development Bank.

identifies a most interesting opportunity for Japan to channelise the Official DA. The talks between the two countries on this aspect are on going, and concluding the negotiation is expected to set out the future path for Japanese ODA to India

It is worth noting that India has started a market trading mechanism for energy savings certificates—the first undertaking by a developing member country. The Perform, Achieve and Trade (PAT) scheme requires energy-intensive factories and utilities to meet a predetermined energy savings target, either through their own technological improvements, operational efficiency improvements, or trading of certificates called ‘ESCerts’ generated from factories and utilities that reach efficiency levels beyond their target. On this ground, the technological competence of Japan can play an important role in setting up the energy saving plants. Here the funds under technical cooperation may be utilised to promote better research and development in order to introduce the economic and environment friendly plants for energy generation. The financial assistance for the campus development of Indian Institute of Technology Hyderabad, and the faculty exchange programme is the best example for enlargement of the scope of a tie up in the field of research and development.

In the recent past, the global renewable energy markets have evolved rapidly. Global new investment in renewable energy saw an average 27 per cent year-on-year growth from \$61 billion in 2005 to \$257 billion in 2011 (Bloomberg New Energy Finance 2012). By the end of 2011, renewable energy, including hydropower, comprised more than 25 per cent of the world’s power capacity (which was estimated at 5,360 gigawatts in 2011) and supplied around 20.3 per cent of global electricity (REN21 2012). Asian countries, particularly the People’s Republic of China (PRC), India, and Japan, are among the leading players in renewable energy investment. The PRC, India, and Japan ranked among the top seven countries in renewable power capacity in 2011 (REN21 2012). The growing demand for energy may be fulfilled with the setting up of new hydro power projects and successful launching of various nuclear power plants. The setting up of three phases of Dhauliganga Hydroelectric Power Plant Construction Project in Uttarakhand marks a significant development in the way of generation of hydro power. The continued support in such areas puts forward an interesting opportunity for Japan to enhance the development level of India. In 2010, around 14 per cent of the total electricity generation in India was from renewable energy. Most of the renewable energy in India consists of hydro and wind, and there is a rising expectation for solar. In 2009, the Government of India published the Jawaharlal Nehru National Solar Mission with the goal of 20 GW of solar power by 2022. This offers an opportunity for Japanese ODA in the energy sector.

Environment: India's higher growth in future will be driven by heavy industrialisation, infrastructure construction, and energy use. India has targeted 20 per cent–25 per cent CO₂ intensity (CO₂ emissions per unit of GDP) improvement between 2005 and 2020, and considers EE&C an important component for achieving this. The past experience of Japanese ODA indicates that the country has been able to provide the necessary assistance to India while keeping into account the eco-friendly system.

Japan's proven energy efficient technologies and alternative energy technologies may support India's efforts for a clean and environment friendly energy use and growth. India and Japan have already stepped in the development of new and renewable energy. Under this plan five working groups on energy have been established to discuss and promote energy cooperation. Also, the development of 'solar city' in India has emerged as a new field for Japanese ODA as Indian government is actively promoting the development of 'Solar Cities'. As per the experts it is assumed that the Solar City project targets to reduce a minimum of ten per cent of demand on conventional fossil energy technologies within the next five years. This phenomenon puts forward an ample opportunity for achieving the level of self-sufficiency in the field of energy by using natural resources, in addition to the cooperation in research and development.²³

Private Sector and ODA: The Japanese government is making efforts through ODA projects to encourage further Japanese corporate investments in recipient countries. For instance, a top recipient of Japanese loans in 2011 was Vietnam, mostly for infrastructure-building projects. The Japanese private sector is now investing heavily in Vietnam, as companies desire to secure access to its growing market. Similarly, the Japanese private firms may be encouraged to accelerate investment through the FDI route under the comprehensive and economic partnership agreement (CEPA). On the other hand, Japanese ODA may look towards direct assistance to development related issues of poverty reduction, health facilities and quality of education particularly in the rural areas. It gives an immense opportunity for both the countries in the sense that the rural area has remained largely out of reach to Japan, and even India has not been able to generate sufficient development related facilities. There are opportunities to involve Japanese corporate sector for ODA supported projects in India, particularly in rural areas provided Indian government provides necessary policy platforms.

Institutional Support: Though Japan's ODA policies differ little from those of other donors which emphasise on improvement in governance, in the context of India, the

²³Panneerselvam Prakash (2012). Japan-India Cooperation: Renewable Energy Need of the Hour. Wochi Kochi Magazine.

emphasis has been on economic infrastructure in the case of India. Recently, JICA signed a Japanese ODA Loan Agreement with the Government of India in New Delhi to provide up to 13 billion yen for the Tamil Nadu Investment Promotion Programme (TNIPP). This loan is JICA's first Programme Loan extended to India to help set up appropriate market institutions. The objective of the TNIPP is to support policy implementation to improve the investment climate (apart from development of infrastructure that would directly benefit those investors including road, power supply, and water and sewerage systems) in Tamil Nadu, thereby easing business hurdles for foreign investors. Signing of such types of agreements open the scope for effective monitoring and investment promotion in other projects located in different states. Taking into account the experience from other donor countries, Japan may look forward to improve the governance in India. It may be considered as the most important area as India is suffering from poor governance. And the imprudent governance may restrict the scope of development promoted by Japan under the infrastructure based model.

Also, there are real opportunities for Japanese ODA to add value to the international system, where it can play to its distinctive strengths. And, to realise this potential, Japan needs to communicate its model and engage in international policy debates more proactively.²⁴

Infrastructure is one of the key challenges facing the Indian economy. Achieving and sustaining high growth rates is largely dependent on the development of efficient and world-class infrastructure in the country. Hence, the significant role being played by Japanese ODA in promoting and setting up transport infrastructure in India is commendable. Several infrastructure projects operationalised with the help of Japanese ODA and technology such as Delhi metro, the dedicate freight corridor project have changed the way of living and urban landscape of Indian cities. Infrastructure development has not only led to reduction in trade costs but also resulted in increase in employment and thereby income and living standards of the people. Japanese ODA is also widespread in other sectors including energy, health and education sectors in India. India and Japan also need to develop their cooperation in the high technology sectors, such as space research, biotechnology, supercomputers, etc. as their joint efforts shall enable them to find solutions to various other problems plaguing the regional and global community.²⁵

7. Japanese ODA to India: Problems and Challenges

²⁴Alina Rocha Menocal and Leni Wild (2012). Where can Japanese Official Development Assistance add value? Overseas Development Institute.

²⁵ VikashRanjan (2011). Evolving India-Japan Relations and the Way Forward.Vivekananda International Foundation.

Japanese ODA faced major challenges on both domestic and international fronts in its own economy. Domestically, a serious fiscal situation due to continuous sluggish growth and huge natural disasters like earthquakes has resulted in a popular demand and pressure to reduce the ODA amount. As a consequence, after becoming the world's largest ODA donor during the 1990s, Japanese ODA has been reduced annually over the past several years. Internationally, changing conditions in many of the recipient countries have raised questions and concerns in Japan about the appropriateness of its aid paradigm. These changes include the 'graduation' from ODA recipient status of many East Asian countries, the cancellation of HIPC (Heavily Indebted Poor Country) debt which has made loan assistance difficult, an emphasis on direct poverty reduction measures rather than on economic growth, and an emphasis on social sectors rather than on economic infrastructure. Within the global development community, there is currently a preference for grant in aid over loans for programmes rather than projects and a focus on Africa rather than other regions. It is time for a serious review and examination of Japanese ODA, to weigh the significance and impact of these challenges and to determine whether and perhaps what kind of new approaches and strategies should be adopted (Akiyama & Nakao 2005). The emergence of new donors such as China, Korea, India and Brazil raises both challenges and opportunities for Japan. Many of these donors share very similar developmental approaches, which could be a source of both competition and collaboration. Japan may also be in a unique way well placed to act as a bridge between the established donor community and these new players, and to date it has sought in particular to build relations with Korea (very successfully) and China (less so).²⁶

The most significant challenge for Japanese ODA comes in the light of domestic economic imbalance. Japan has experienced serious natural disasters and the country had to devote substantial amount of funds to manage this crisis. After two severe shocks of global financial crisis and the great East Japan Earthquake, Japan faced a severe downturn. The public debt ratio has risen steadily for two decades, to over 200 per cent of GDP. In such a situation, Japan has actively pursued the path of restoring fiscal sustainability. To overcome deflation and boosting Japan's growth potential emerged key challenges before the Japanese economy.²⁷ Domestically, a serious fiscal situation has led to declining popular support for Japanese ODA to other countries. Moreover, the Japanese taxpayers are often anxious about the proper utilisation of their money. In case of India, despite huge official DA, the country still has not shown any significant dent on the grounds of poverty, improvement in health

²⁶ Alina Rocha Menocal, Lisa Denney & Matthew Geddes (July 2011). Informing the Future of Japan's ODA: Locating Japan's ODA within a crowded and shifting market place. The Overseas Development Institute, London

²⁷ OECD (2013). OECD Economic Surveys JAPAN. Organization for Economic Cooperation and Development.

issues especially in comparison to other recipient countries of Japanese ODA, which has discouraged Japanese tax payers about the validity of ODA to India. The India Country Report on the MDGs points out that while some goals like those relating to poverty and education are on track at aggregate levels, progress on other goals concerning hunger, maternal mortality, under-5 mortality and provision of basic services such as water and sanitation is slow and the targets are unlikely to be achieved.²⁸ This outcome puts a question mark on the effectiveness of Japanese ODA to India, which has been receiving highest amount of Japanese ODA. The reason may be that the infrastructure base of India has remained poor and most of the funds were channelised to develop this base. As stated, the Japanese ODA is unique in the sense that it considers the high economic growth as a precondition for development. However, this very argument has invited many critics in recent years.

Japan's focus on economic infrastructure is actually based on its own development experience and on the belief that sustainable development and long-lasting poverty reduction can be achieved through economic growth. The high growth requires a high-standard of economic infrastructure: ports, highways, railways and power stations. It is true also that the Japanese business community has benefited because the strengthened economic infrastructure in East Asia has facilitated trade and investment. Over the years, it has been pointed out that in implementing ODA, it becomes more and more important to work closely together with NGOs and the business community, as well as to obtain public understanding and support.

While setting up different infrastructure projects like electricity, power, etc Japanese companies are concerned about issues relating to infrastructure, taxation system, and customs clearances in India. Land acquisition is a major obstacle to facilitate Japanese investments in India. In a report, the Heritage Foundation has held corruption responsible for choking growth in India by making it difficult for entrepreneurs to start business. Moreover, India ranked 132nd among 185 countries worldwide in the World Bank's 'Doing Business 2013,' indicators which are relatively low compared with India's South Asian neighbours. It is critical for India to make policy and institutional improvements, and to develop quality infrastructure for realising higher economic growth and development.

Japan supports the growth oriented model of development. However, in the case of India the existence of trickle-down theory has been challenged. It poses a serious challenge before

²⁸GOI & UNICEF (2011). India United Nations Development Action Framework 2013-17. Government of India. UNICEF.

Japan for simultaneously giving a boost to the industrial promotion and humanity issues. The identification of proper mix of these two approaches has remained a major problem for the policy makers in Japan for channelling the DA.

India has been able to sustain high economic growth for the first decade of 21st century but faced a slowdown in the economic growth in recent years. However, country has adopted the expansionary fiscal policy to maintain the demand led economic growth model, and substantial amount has been spent by the government on social infrastructure in the past decade. It is worth noting that the foreign assistance from Japan, be it the economic infrastructure and social development, supplements domestic resources. However, India's rise as developing country and not so significant impact of Japanese ODA create a doubt among the Japanese government to come forward and maintain the same level of assistance for development in India.

In the recent past, India has experienced the supply side constraints also, which are mainly associated with policy paralysis in the country. The industrial and infrastructure projects in India got delayed in implementation due to lack of clear-cut policies on land acquisition and a multiplicity of authorities and bureaucratic hurdles.²⁹ Obtaining environmental clearances is also a problem in India. At the same time, the projected investment requirements for infrastructure are placed at \$ 1 trillion in the 12th plan and the funding gap is estimated to be above Rs. 5000 billion³⁰.

Poverty, starvation, infectious diseases, climate change, and natural disasters are some of the many serious problems faced by developing countries. Since overcoming these problems requires substantial financial resources, it is difficult to meet these needs with ODA alone. It is necessary to meet financial needs using diverse financial resources, and it is expected that private capital will play an important role in this. In recent years, the flow of private capital into developing countries has increased greatly, accounting for 70 per cent of the funds going to these countries. Private capital for developing countries from DAC member countries amounted to \$322.3 billion in 2011, which is twice the total ODA amount (\$134 billion amount) of DAC member countries for the same year.

At this juncture the delay in implementation of projects due to land acquisition, complex process of environmental clearances, poor regulatory environment, etc. discourage the

²⁹Romit Guha, March 13 2013. IMF: India should resolve bottlenecks', *The Wall Street Journal*.

³⁰The present environment of widened fiscal deficit restricts the scope of easy financing to the promised infrastructure projects. According to the 12th Plan approach paper the share of private sector in infrastructure investment will have to rise substantially from about 37 per cent in the 11th Plan to about 48 per cent in the 12th Plan to help the government meet its infrastructure needs.

private investors to come forward more actively. At present, more than 50 per cent of projects are stuck at various stages of implementation due to variety of regulatory hurdles and sector specific bottlenecks leading to significant time and cost overruns.³¹ However, various active measures have been taken by the Indian government while considering these obstacles. These hurdles have direct bearings on the level of infrastructure development in India, and obviously the impact of these constraints apply extensively to the Japanese ODA in India as Japan has intensively invested in the development of economic infrastructure sector in India. This phenomenon has created doubts about the effective functioning of the JICA Private Sector Investment Finance system, which provides financing and loans directly to private sector projects that contribute to growth in developing countries.

In the recent five year plan, India envisaged the key areas as inclusive growth, improving food and nutrition security, promoting gender equality, ensuring access to quality basic services, strengthening decentralisation and delivering sustainable development. Whereas Japan's ODA has considered three priority areas for India: 1) promotion of economic growth 2) improvement of poverty and environmental issues, and 3) expansion of human resource development and human exchange. These three areas support India's development policies and are consistent with India's policy priorities. Furthermore, the Official DA Charter of Japan lists five basic principles: (1) supporting self-help efforts of developing countries, (2) perspective of 'human security', (3) assurance of fairness, (4) utilisation of Japan's experience and expertise, and (5) partnership and collaboration with the international community. India is found facing key development challenges- the need to improve programme implementation, accountability and service delivery, and to particularly address the failure of public systems to effectively deliver food, education, health and other basic goods and services (GOI, UNICEF 2011). All these challenges of India somehow create scepticism about the efficacy of Japanese ODA to India in the mind of the Japanese government and its people.

With the growing energy demand, India is looking forward to the nuclear power based energy generation. The country is in the process of concluding the Indo-Japan civil nuclear deal, but even this negotiation foresees many challenges. The Fukushima disaster is still fresh in the electorate's memory in both India and Japan. In India, the civil nuclear deal can take shape before it goes through parliamentary debates and political hurdles and faces the larger people's movements against some of our proposed reactors, energy policy and related

³¹ Keynote address delivered by Dr. K.C. Chakrabarty, Deputy Governor, Reserve Bank of India at the Annual Infrastructure Finance Conclave organised by SBI Capital markets Limited at Agra on August 9 2013).

critical issues.³² On this front, there are political and social hurdles to the Japanese ODA in India.

Measures needed to facilitate smooth flow of ODA to India: Governments and private sectors in the two countries should examine how governments can support best PPP for infrastructure development. They should share the latest intellectual resources, when promoting the plan for DMIC and Freight Corridor. Another area worth considering is investment by Japanese financial institutions in the infrastructure funds of Indian financial institutions.³³ Japan may contribute significantly for various proposed special economic zone projects in India

The Planning Commission in 2013 identified nine projects worth Rs 1,15,000 crore that could have been awarded this year. These include the Rs 30,000-crore Mumbai Elevated Rail Corridor, two locomotive projects worth Rs 5,000 crore, a DFC worth Rs 10,000 crore, a port project in West Bengal or AP involving investments of Rs 10,000 crore, two airport projects worth Rs 20,000 crore and two power and transmission projects worth Rs 40,000 crore.³⁴

The pressing global challenge today is that developed donor nations are in economic decline and facing severe issues of aging and social instability along with growing unemployment. It is becoming increasingly difficult to continue providing health aid in traditional ways. With new players and emerging donor countries, a new approach is essential. Because Asia has become the growing centre of the world economy and Africa is expected to become another potential market, more corporate players are naturally investing in these regions and encouraging business instead of aid, thereby improving local economies and employment for sustainable growth. The social business model has the potential to create sustainable local economies with modest returns and local employment and to gradually improve public health and the standard of living.

It is clear that in order to raise the bar of bilateral ties to the next level in the future, the convergences have to be cultivated and optimised, while divergences have to be diluted and narrowed down. It is important not to limit the cause of furthering India-Japan relations just as a measure to counter or hedge against the rise of China, but to see more substance in it.

³²Rakesh Neelakandan (June 03 2013). The hurdles before Indo-Japan civil nuclear deal. Commodity Online.

³³ The Policy Council the Japan Forum on International Relations (2007). The 29th Policy Recommendations. India's Leap Forward and Japan.

³⁴Yogima Seth (November 19 2013). Flagship infrastructure projects pending, Govt. to miss target this fiscal. *The Economic Times*.

Some steps need to be taken to further strengthen and bolster India-Japan ties. Firstly, it is important to work on and ameliorate the hurdles in the bilateral economic relationship. Towards that end, India has to take steps like improvement of infrastructure and cutting down on red-tapism and corruption and become an attractive and welcoming trade and investment destination. New Delhi also needs to proactively work towards developing areas like production of rare earth minerals to prove to be a viable alternative to China.

Furthermore, it will also help to find commonalities even in divergences. For instance, on the prospects of civilian nuclear cooperation, yet to occur, the two sides can work towards research and development on how best to minimise risks to nuclear sites in case of natural calamities like the Fukushima disaster or terror attacks on nuclear facilities. Moreover, there remain other low key sectors of cooperation like science and technology and water and food security. Lastly, the language barrier has to be overcome and consistent efforts made to increase awareness and people-to-people exchange.

Both countries need to realise and earmark their commonalities and complementarities, which go much beyond 'balancing' against China, work harder and align their efforts within definitive timeframes so that they can look back with greater pride when they complete a century of establishment of diplomatic ties in a few decades from now.³⁵

In the past years, few suggestions have been pronounced for making the Japanese ODA more effective and efficient. These included greater coordination among ministries/agencies, increased coordination and cooperation with other donors, increased Emphasis on Results-Based Management, innovation for loan assistance, more focused assistance based on comparative advantage.

India is going to explore the demographic dividend, which in turn sustains economic growth. India's ability to harness the benefits of the demographic dividend will require targeted investments in adolescents and young people. In this direction, the expertise of Japanese manpower can add value to the India labour force. However, Japan has been continuously assisting India in terms of knowledge creation rather than knowledge transfer. But, still it gives an immense opportunity to both the countries to fully exploit the Indian manpower base. The continuous support to the economic infrastructure can engage the young population of India in productive work which in turn envisions the long-lasting impact on poverty, hunger and other social development issues.

³⁵Arpita Mathur (2012). India-Japan relations drivers, trends and prospects. RSIS monograph no. 23. S. Rajaratnam School of International Studies

Since Japanese ODA is more focused on economic development through supporting economic infrastructure, India needs do much more in policy in the infrastructure sector. One of the core reasons for lagging infrastructure development in the country has been the poor management of PPPs. Several factors contribute to the same. Poorly drafted contracts have often been mentioned as one of the concerns. This ambiguity leads to less than optimal utilisation of the proposals. Inexperience in the public sector regarding PPPs and even the project's requirements and demands sometimes threatens to derail the endeavours. Unclear identification of authority has also been a prime concern. Added to that is the lack of performance measurement. Inadequate monitoring and management risks remain core causes of generic mismanagement. Disputes slow down progress and also sometimes take away from the benefits of the proposal. The core factors hindering infrastructure development include: problems faced during planning, implementation and execution of infrastructure projects, policy and regulatory gaps and inadequate availability of long-term finance; inadequate capacity in the private sector and inadequate shelf of bankable infrastructure projects that can be bid out to the private sector; land acquisition: resistance from local communities has led to delays and lack of proper dispute resolution mechanism; regulatory framework: Inadequate regulatory framework and inefficient approval process leads to delays in project completion; large projects involve dealings with many ministries are cumbersome and these bureaucratic complexities are considered a serious disincentive for developers and contractors; environmental safeguards are one of the major causes of delay, especially in power projects; delay in clearances & implementation lead to time overruns, cost overruns and delay in financial closure of projects. There is an urgent need to ensure a stable legal framework, competent institutional mechanisms, and efficient dispute resolution and tackling governance issues. Further, there is a need for improvement in transparency of project contract awards; efficient pricing of infrastructure and independent regulation. In sum, unless India continues to emphasise and focus on its infrastructure development, it may find it difficult to achieve and sustain a high growth trajectory in the years to come.

10. Conclusion

The ODA from Japan is different from other donors of DAC of OECD as it focuses on economic infrastructure to enhance the long-term growth drivers of the recipient countries. India is the largest recipient of Japanese ODA, which consists of concessional loans, grants in aid and technical cooperation. Indian needs to sustain its high growth rate to lift a large number of its population above the poverty line.

Infrastructure development is one of the major concerns in India today, as poor infrastructure is in the way of sustaining the 8 to 10 per cent annual growth rate. Hence, the significant role being played by Japanese ODA in promoting and setting up transport infrastructure in India is commendable. Several infrastructure projects (such as the Delhi Metro and the dedicated freight corridor) operationalised with the help of Japanese ODA and technology have changed the way of living and the urban landscape of Indian cities. Infrastructure development has led not only to reduction in trade costs but also to increase in employment and, thereby, income and living standards of the people. Japanese ODA is also widespread in other sectors (including energy, health and education) in India. India and Japan also need to develop their cooperation in high technology sectors, such as space research, biotechnology, supercomputers, etc. as their joint efforts shall enable them to find solutions to various problems plaguing the regional and global community.

Although difficult fiscal conditions, natural disasters and also a rethink on the pattern of ODA in Japan have moderated its ODA to India, India is still a priority for Japan. On the other hand, India needs financial, technical and human resource development assistance to meet the increasing gap between demand and supply in its economic infrastructure such as transport, energy, institutional development, and other social infrastructures. More Japanese ODA that contributes to India's growth story would strengthen Indo-Japan economic and strategic partnership, which is crucial for a stable and secure Asia.

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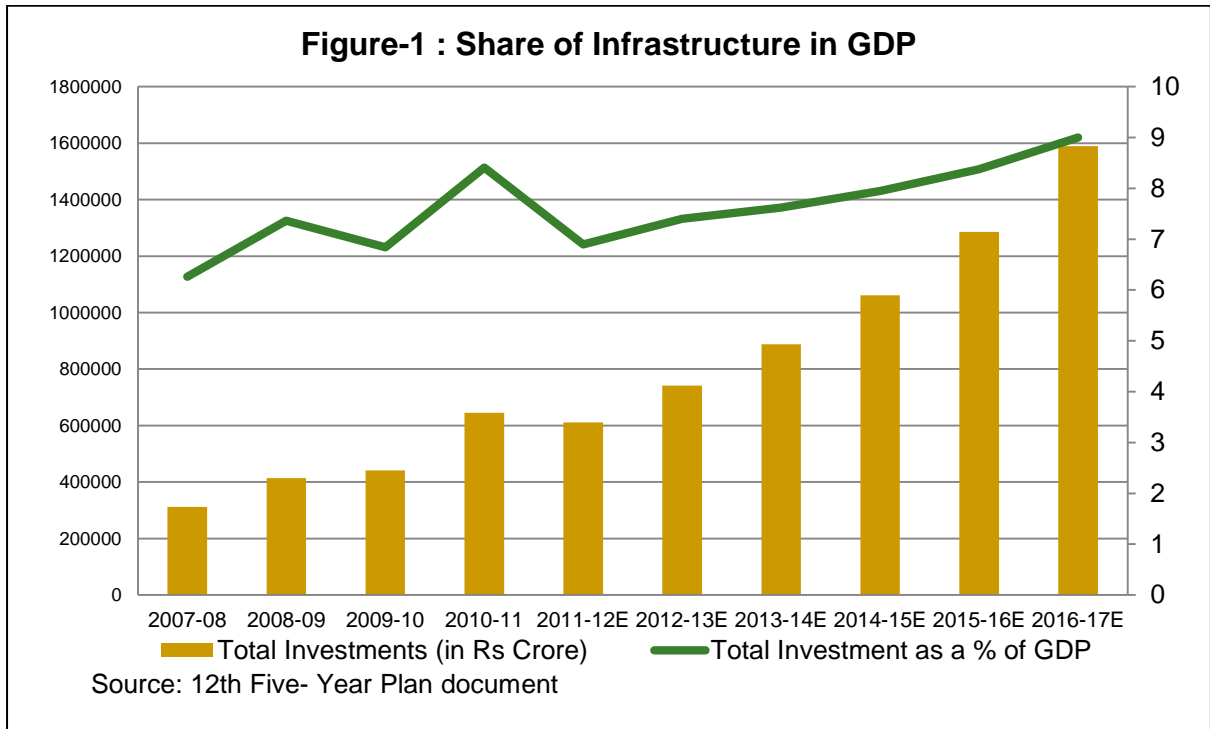
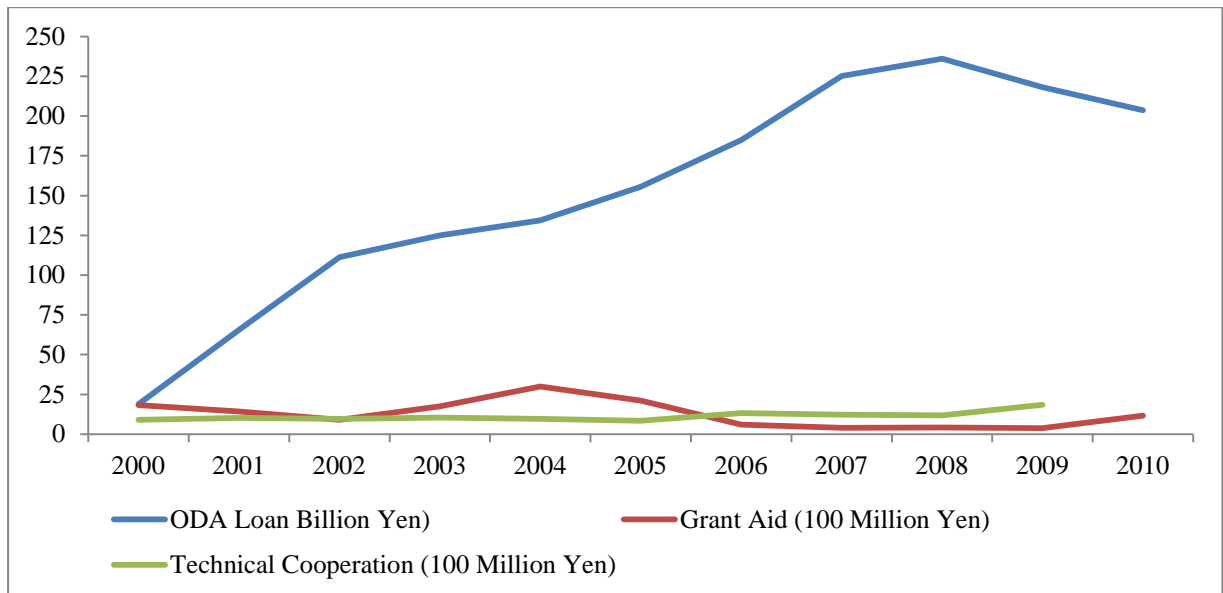


Figure-2

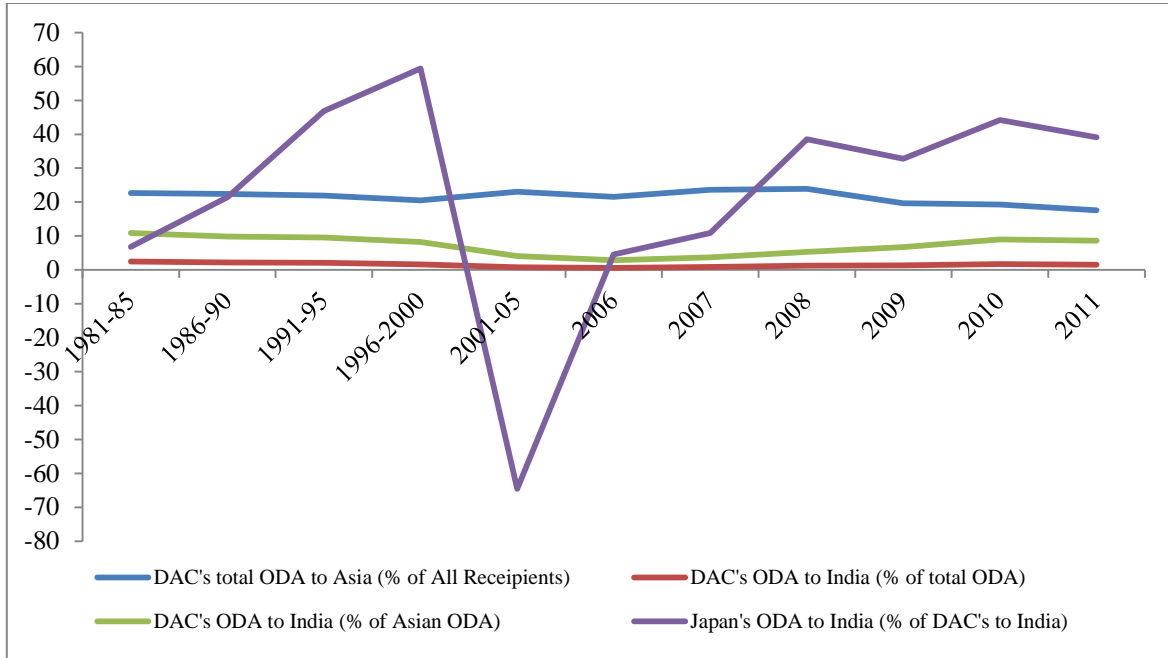
Japan's ODA for India by Scheme



Source: Ministry of Foreign Affairs of Japan

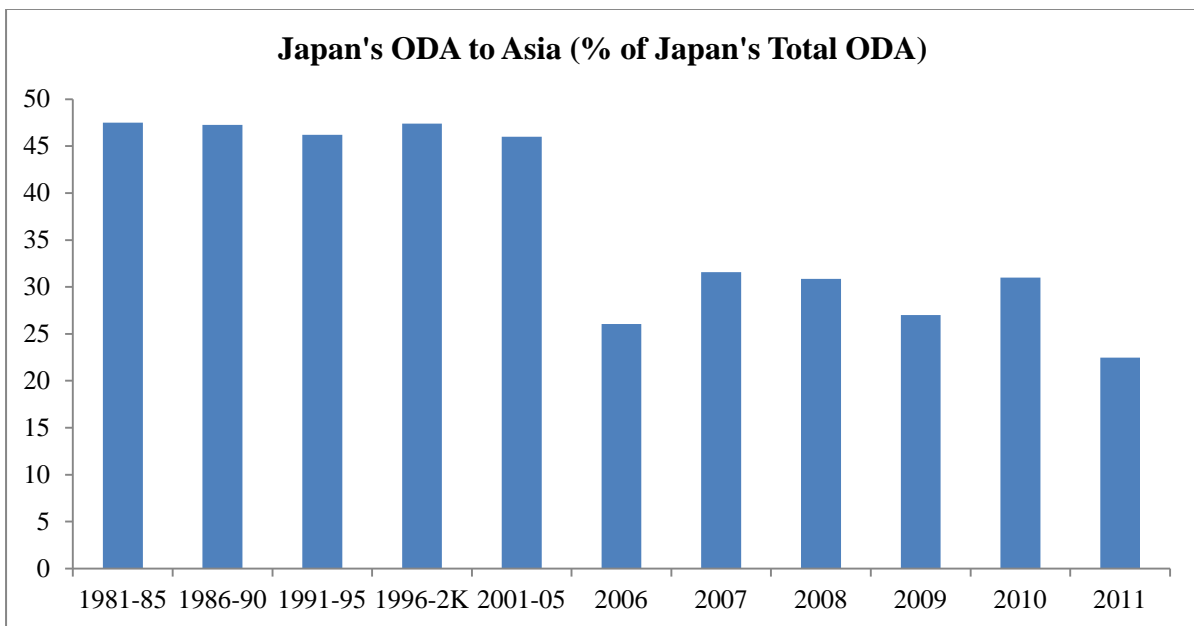
Figure-3

Official Development Assistance



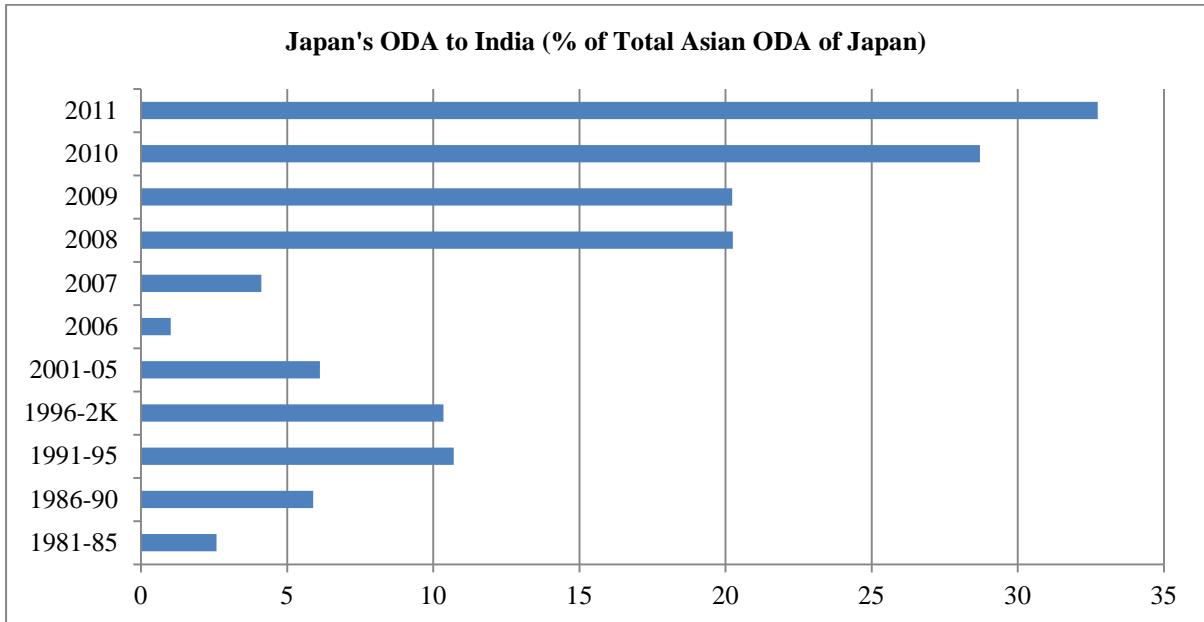
Source: OECD

Figure-4



Source: OECD

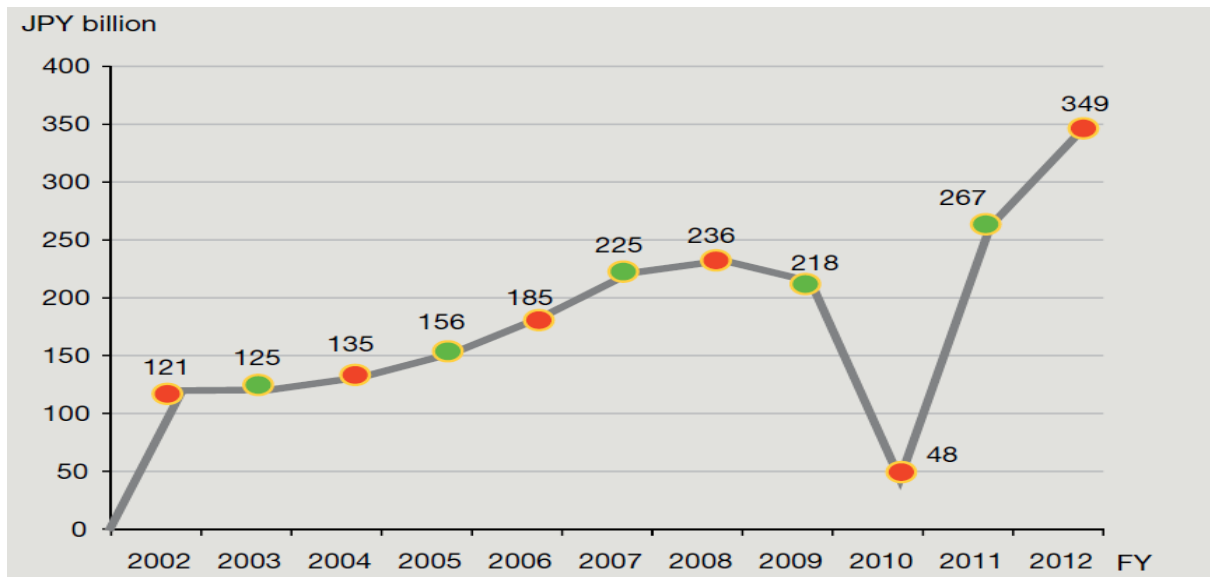
Figure-5



Source: OECD

Figure-6

Trends in ODA Loan Commitment for the past 10 years (FY 2002-2012)



Source: Operations and Activities in India, Japan International Cooperation Agency

TABLE-1**Infrastructure Development in India: A comparative Picture**

	India		China	
Country	2006-07		2012-13	
	score	Rank	score	Rank
India	3.5	62	3.7	85
China	3.54	60	4.5	48
Japan	6.11	7	6.0	9
Korea	5.38	21	5.8	11
Thailand	5.36	38	4.5	47
Malaysia	5.09	23	5.2	29

Source: Doing Business, World bank 2013.

TABLE-2**Doing Business Indicators**

	China			India		
	2008	2010	2011	2008	2010	2011
Nos. of days to start a business	35	37	38	33	30	29
Nos. of days to enforce commercial contract	406	406	406	1420	1420	1420
No's of procedures to enforce contract	35	34	34	46	46	46
Cost of exports (US\$ per container)	390	500	500	820	945	1055
Cost of imports (US\$ per container)	430	545	545	910	960	1025

Source: Doing Business, World bank 2013.

TABLE-3**Infrastructure Indicators: India and China**

	CHINA				INDIA			
	1990	2000	2005	2010	1990	2000	2005	2010
Electric Power consumption (KW per capita)	511	993	1783	2774	268	387	456	590
Energy Use (Kg of oil equivalent)	760	867	1301	1793	362	434	471	580
Paved roads (per cent of total roads)			41	57	47	48	47	51
Total rail route (in 000 km)	53.3	58.6	62.2	66.2	62.3	62.7	63.4	63.9
Air freight trans. (Milli.ton for km)	818	3900	7579	1744	663	548	7775	1720
Air pass. Transport (1000 pop)	14.6	49	105	200	12.4	16.4	24.5	53.4
Internet users (1000 pop)	0	1.8	8.5	34.3	0	0.53	2.39	7.5
Total telephones (Per 1000 persons)	0.6	18.1	57	86	0.58	3.42	12.3	64.3
Labour force participation (per cent of total population working)	79	77	75	74	61	59.5	61	55.6

Source: World development Indicators, various years, World bank.

Table-4**Development Assistance Committee's (DAC) Official Development Assistance****(US\$ Billion)**

	1981-85	1986-90	1991-95	1996-2000	2001-05	2006	2007	2008	2009	2010	2011
All Recipients	27.00	44.70	59.01	52.85	73.78	105.02	104.43	122.25	120.04	128.52	133.97
Asia	6.12	9.97	12.96	10.88	18.02	22.61	24.67	29.23	23.58	24.76	23.57
Afghanistan	0.00	0.06	0.12	0.10	1.29	2.42	3.01	4.00	5.12	5.49	5.76
Pakistan	0.36	0.68	0.46	0.37	0.71	1.15	0.98	0.92	1.33	2.42	2.64
Vietnam	0.09	0.08	0.40	0.82	1.02	1.32	1.52	1.65	2.08	1.83	2.06
India	0.66	0.96	1.24	0.87	0.59	0.65	0.91	1.56	1.58	2.22	2.04
Iraq	0.01	0.02	0.20	0.14	5.77	8.56	9.06	9.76	2.63	2.01	1.80

Source: Development Assistance Committee Aid Statics, OECD.**Table-5****DAC Official Development Assistance (Shares in Percentage)**

	1981-85	1986-90	1991-95	1996-2K	2001-05	2006	2007	2008	2009	2010	2011
Asian Region (per cent of All Recipients)	22.70	22.44	21.97	20.50	23.02	21.53	23.62	23.91	19.65	19.27	17.59
Percentage Shares in DAC's Total ODA to Asian Region											
Afghanistan	0.01	0.54	0.89	0.93	7.43	10.68	12.21	13.68	21.70	22.16	24.46
Pakistan	5.92	6.78	3.55	3.33	4.97	5.08	3.97	3.14	5.64	9.76	11.18
Vietnam	1.44	0.82	3.03	7.53	6.56	5.83	6.15	5.66	8.82	7.38	8.73
India	10.85	9.81	9.52	8.23	4.08	2.89	3.71	5.32	6.69	8.96	8.64
Iraq	0.12	0.20	1.52	1.33	20.67	37.84	36.71	33.40	11.15	8.11	7.65

Source: Development Assistance Committee Aid Statics, OECD.

Table-6**Official Development Assistance (Shares in Percentage)**

Recipient(s)	1981-85	1986-90	1991-95	1996-2K	2001-05	2006	2007	2008	2009	2010	2011
DAC's total ODA to Asia (per cent of All Recipients)	22.70	22.44	21.97	20.50	23.02	21.53	23.62	23.91	19.65	19.27	17.59
DAC's ODA to India (per cent of total ODA)	2.45	2.16	2.11	1.65	0.80	0.62	0.88	1.27	1.31	1.73	1.52
DAC's ODA to India (per cent of Asian ODA)	10.85	9.81	9.52	8.23	4.08	2.89	3.71	5.32	6.69	8.96	8.64
Japan's ODA to India (per cent of DAC's to India)	6.82	21.43	46.88	59.35	-64.50	4.52	10.93	38.55	32.76	44.21	39.09

Source: Development Assistance Committee Aid Statics, OECD.

Table-7**Japan's ODA to Asia and Asian Countries (Values in US \$ Million)**

	1981-85	1986-90	1991-95	1996-2000	2001-05	2006	2007	2008	2009	2010	2011
All Recipients	3610.20	8024.80	12218.80	11021.60	10011.50	11135.80	7697.20	9600.80	9466.60	11021.40	10831.40
Asia	1685.50	3796.50	5618.80	5257.10	4695.50	2899.90	2429.50	2962.10	2555.20	3417.20	2432.20
Vietnam	0.90	2.70	109.90	469.10	507.30	562.70	640.00	619.00	1191.40	807.80	1013.10
India	43.60	210.90	601.00	515.60	267.50	29.50	99.90	599.80	517.00	981.10	796.40
Afghanistan	-0.10	0.00	0.00	0.10	82.10	107.40	101.00	208.00	335.90	745.70	750.30
Pakistan	89.20	190.30	200.20	263.20	197.30	225.00	53.20	34.20	131.40	207.90	528.50
Iraq	2.90	8.30	0.10	0.40	833.60	780.80	858.80	1755.20	28.10	144.40	370.20
Sri Lanka	66.30	161.30	195.40	161.20	193.70	202.60	44.20	96.70	91.60	155.40	168.10

Cambodia	0.20	1.00	56.60	72.90	106.30	106.30	113.60	114.80	127.50	147.50	130.90
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Source: Development Assistance Committee Aid Statics, OECD.

Table-8

Japan's ODA to Asia and Asian Countries (Shares in Percentage)

Recipient(s)	1981-85	1986-90	91-95	96-2000	2001-5	2006	2007	2008	2009	2010	2011
Asia (per cent of All Receipts)	47.49	47.27	46.22	47.40	46.01	26.04	31.56	30.85	26.99	31.01	22.46
Shares in Total Asian ODA of Japan (per cent)											
Vietnam	0.05	0.08	1.88	8.41	11.51	19.41	26.34	20.90	46.63	23.64	41.65
India	2.58	5.89	10.70	10.35	6.12	1.02	4.11	20.25	20.23	28.71	32.74
Afghanistan	-	-	-	0.00	2.03	3.70	4.16	7.02	13.15	21.82	30.85
Pakistan	5.30	5.04	3.53	5.01	4.72	7.76	2.19	1.16	5.14	6.08	21.73
Iraq	0.16	0.30	0.00	0.01	13.22	26.93	35.35	59.26	1.10	4.23	15.22
Sri Lanka	3.92	4.27	3.48	3.22	4.16	6.99	1.82	3.26	3.59	4.55	6.91
Cambodia	-	-	0.97	1.46	2.42	3.66	4.67	3.87	4.99	4.32	5.38

Source: Development Assistance Committee Aid Statics, OECD.

Table-9

Commitments and Disbursements of ODA loan from Japan to India

Year	Commitment		Disbursement	
	Yen Billion	Rs. Crores	Yen Billion	Rs. Crores
2008-09	236.05	11713.32	122.56	5861.48
2009-10	218.20	10694.93	128.95	6553.43
2010-11	203.57	11197.81	123.84	6581.67
2011-12	134.29	8303.01	139.22	8497.43
2012-13	353.11	23179.77	113.96	7259.95
2013-14	101.70*	6812.00	22.32**	1249.85**

Note: * upto 30.05.2013, ** upto 30.06.2013, Source: Ministry of Finance, Government of Japan

Table-10**Sector-wise Japan's Total Official DA(per cent Share in total ODA)**

Sector	1971-75	1976-8-	1081-85	1986-90	1991-95	1996-2000	2001-05	2006-11
I. Social Infrastructure & Services	5.96	7.49	17.42	17.88	20.76	20.78	20.42	23.75
I.1. Education	3.23	2.36	4.89	6.37	7.13	6.23	7.56	5.41
I.2. Health	0.83	2.15	4.12	2.44	1.93	2.39	2.66	2.02
I.3. Population Pol./Progr. & Reproductive Health	-	-	-	-	0.11	0.17	0.10	0.26
I.4. Water Supply & Sanitation	-	-	5.62	4.59	7.44	10.05	6.80	12.32
I.5. Government & Civil Society	0.24	0.95	0.45	0.74	0.98	0.84	1.79	2.63
I.6. Other Social infrastructure & Services	-	1.31	2.35	3.68	3.16	1.08	1.50	1.11
II. Economic Infrastructure & Services	24.81	39.84	37.08	36.72	39.25	37.40	29.62	34.60
II.1. Transport & Storage	-	-	14.95	16.64	18.03	22.25	16.82	21.61
II.2. Communications	-	-	4.50	5.50	3.44	1.99	1.08	0.46
II.3. Energy	12.37	-	17.44	11.27	15.62	12.36	11.34	11.77
II.4. Banking & Financial Services	-	-	-	-	1.68	0.22	0.21	0.17
II.5. Business & Other Services	-	-	-	3.24	0.48	0.58	0.16	0.59
III. Production Sectors	26.91	26.84	26.67	18.33	14.54	13.53	9.44	8.80
III.1. Agriculture, Forestry, Fishing	4.57	10.81	12.64	10.37	10.04	9.74	7.41	5.26
III.2. Industry, Mining, Construction	20.93	13.23	11.99	7.54	4.18	3.45	1.53	2.70
III.3.a. Trade Policies & Regulations	-	-	-	-	-	-	0.33	0.37
III.3.b. Tourism	-	-	-	-	-	-	0.17	0.46
IV. Multi-Sector / Cross-Cutting	-	6.09	-	-	2.35	4.64	3.71	6.89

V. Total Sector Allocable (I+II+III+IV)	61.68	80.25	82.08	73.93	76.89	76.35	63.19	74.04
VI. Commodity Aid / General Prog.Ass.	9.14	3.49	4.84	15.05	8.72	6.17	0.64	4.79
VI.1. General Budget Support	-	-	-	-	-	-	-	2.51
VI.2. Dev. Food Aid/Food Security Ass.	7.70	3.49	4.84	0.84	0.38	0.34	0.39	1.55
VII. Action Relating to Debt	8.65	2.29	1.25	3.45	6.93	5.33	23.96	10.11
VIII. Humanitarian Aid	-	0.18	0.14	0.55	0.51	1.10	2.11	2.98
IX. Unallocated / Unspecified	20.30	13.79	11.69	7.02	6.94	11.05	10.10	8.08
Total (V+VI+VII+VIII+IX)	100	100	100	100	100	100	100	100

Source: Development Assistance Committee Aid Statics, OECD.

Table-11

Sector-wise Japan's ODA to India (Values in US \$ Million)

Sector	2005	2006	2007	2008	2009	2010	2011
1000: Bilateral ODA Commitments by Purpose (CRS)	1247.2	1366.2	1931.2	2773.1	1527.8	2522.2	2280.4
100: SOCIAL INFRASTRUCTURE & SERVICES	497.8	358.2	911.9	306.1	644.5	20.6	424.8
140: Water supply and sanitation	483.4	349.6	904.0	299.8	637.0	3.9	412.8
200: ECONOMIC INFRASTRUCTURE AND SERVICES	320.6	848.7	589.3	1986.4	866.5	2388.0	1097.2
215: Transport and Communications	175.6	516.2	155.1	1782.8	863.4	2382.9	252.5
230: Energy	144.6	331.7	433.7	202.3	2.9	4.0	844.5
300: PRODUCTION SECTORS	423.5	155.9	423.7	475.4	10.1	46.7	642.3
310: Agriculture, forestry and fishing	334.0	151.1	419.8	181.5	2.7	38.1	264.8
320: Industry, mining and construction	2.8	4.7	3.5	293.7	7.2	6.9	377.4
400: MULTI-SECTOR	3.2	0.8	1.1	1.3	1.3	66.8	115.8

Source: Development Assistance Committee Aid Statics, OECD.

Table-12**Sector-wise Japan's ODA to India (Shares in per cent Japan's Total ODA)**

Sector	2005	2006	2007	2008	2009	2010	2011
1000: Bilateral ODA Commitments by Purpose (CRS)	100	100	100	100	100	100	100
100: SOCIAL INFRASTRUCTURE & SERVICES	39.91	26.22	47.22	11.04	42.18	0.82	18.63
110: Education	0.37	0.15	0.19	0.10	0.24	0.54	0.19
140: Water supply and sanitation	38.76	25.59	46.81	10.81	41.69	0.16	18.10
200: ECONOMIC INFRASTRUCTURE AND SERVICES	25.70	62.12	30.51	71.63	56.71	94.68	48.11
215: Transport and Communications	14.08	37.79	8.03	64.29	56.51	94.48	11.07
230: Energy	11.59	24.28	22.46	7.29	0.19	0.16	37.03
300: PRODUCTION SECTORS	33.96	11.41	21.94	17.14	0.66	1.85	28.16
310: Agriculture, forestry and fishing	26.78	11.06	21.74	6.55	0.17	1.51	11.61
320: Industry, mining and construction	0.23	0.34	0.18	10.59	0.47	0.27	16.55
400: MULTI-SECTOR	0.26	0.06	0.06	0.05	0.09	2.65	5.08

Source: Development Assistance Committee Aid Statics, OECD.

Table-13**Sector-wise Japan's ODA to India (Shares in per cent Japan's Total ODA for Respective Sector)**

Sectors	2005	2006	2007	2008	2009	2010	2011
1000: Bilateral Official DA	7.19	10.07	14.96	15.44	10.26	14.40	14.32
100: SOCIAL INFRASTRUCTURE & SERVICES	14.48	12.00	26.28	9.79	14.57	0.52	11.11
110: Education	0.57	0.22	0.51	0.34	0.46	1.57	0.48
140: Water supply and sanitation	22.71	27.95	46.84	17.97	22.86	0.20	24.12
200: ECONOMIC INFRASTRUCTURE AND SERVICES	7.92	24.59	19.19	30.49	17.35	28.40	16.98
215: Transport and Communications	5.93	23.70	10.64	39.20	21.99	45.23	6.80
230: Energy	13.70	26.77	29.37	13.02	0.28	0.13	31.20
300: PRODUCTION SECTORS	31.67	13.88	33.20	21.36	0.92	4.55	44.65

310: Agriculture, forestry and fishing	33.17	25.24	39.76	17.41	0.37	5.21	40.42
320: Industry, mining and construction	1.48	3.20	2.11	26.36	2.14	3.45	55.49
330: Trade and tourism	61.83	0.04	0.76	0.29	0.79	1.81	0.05
400: MULTI-SECTOR	0.61	0.14	0.11	0.16	0.21	4.27	6.15
500: PROGRAMME ASSISTANCE	-	-	-	-	0.00	-	-
600: ACTION RELATING TO DEBT	-	-	-	-	-	-	-
700: HUMANITARIAN AID	-	0.15	-	-	-	0.01	0.04
998: UNALLOCATED/UNSPECIFIED	0.16	0.18	0.41	0.23	0.33	-	-

Source: Development Assistance Committee Aid Statics, OECD.

Table-14

List of Projects for which Government of Japan has Committed

JICA's ODA Loan during FY 2012-13

S. No.	Name of the Project	Amount in JPY million	Amount in Rs. Crores
1	Delhi Water Supply Improvement Project	28,975	1,704
2	Rajasthan Rural Water Supply and Fluorosis Mitigation Project Phase II (Nagaur)	37,598	2,199
3	Tamil Nadu Transmission System Project	60,740	3,572
4	Campus Development Project of IIT-Hyderabad	5,332	306
5	DFC Project (Phase 2) (II)	1,36,119	9,585
6	Chennai Metro Project (III)	48,691	3,418
7	Bihar National Highway Improvement Project (Phase 2)	21,426	1,438
8	West Bengal Piped Water Supply Project (Purulia)	14,225	955
	Total	3,53,106	23,179

Source: Ministry of Finance, Government of Japan

Table-15**List of JICA assisted Projects under implementation**

Name of the Project	Location	Date of Signing	Date of Closing	Loan Amount (Million Yen)	Shares in Total (per cent)
DFC Project Phase 2 (II)	Central-All India	28.3.2013		136119	8.23
Delhi Mass Rapid Transport System Project Phase 3	Central - Delhi	29.3.2012	28.5.2018	127917	7.73
DFC Project Phase 1 (II)	Central-All India	31.3.2010	18.2.2023	90262	5.46
Delhi Mass Rapid Transport System Project Phase 2 (IV)	Delhi	31.3.2009	28.7.2015	77753	4.70
Tamil Nadu Transmission System Improvement Project	Tamil Nadu	28.9.2012	23.1.2020	60740	3.67
Chennai Metro Project (II)	Tamil Nadu	31.3.2010	15.6.2017	59851	3.62
Chennai Metro Project (III)	Central-Tamil Nadu	28.3.2013		48691	2.94
Bangalore Metro Rail Project	Central - Karnataka	31.3.2006	24.7.2016	44704	2.70
Hyderabad Outer Ring Road Project Phase 2	AP	21.11.2008	25.02.2017	42027	2.54
Bangalore Water Supply and Sewerage (II)	Karnataka	31.3.2005	28.7.2015	41997	2.54
Hyderabad Outer Ring Road Project Phase.1	AP	10.3.2008	25.3.2016	41853	2.53
Rajasthan Rural Water supply and Fluorosis Mitigation Project (Nagaur)	Rajasthan	28.9.2012	23.1.2020	37598	2.27
Delhi Mass Rapid Transport System Project (Phase 2)	Delhi	31.3.2010	15.6.2016	33640	2.03
Kerala Water Supply Project (II)	Kerala	30.3.2007	31.3.2013	32777	1.98
Yamuna Action Plan Project (III)	Central - Delhi	17.2.2011	15.2.2022	32571	1.97
Top 15 Sectors				908500	55.0
Total	India			1654324	100

Source: Ministry of Finance, Government of Japan

Table-16**Major Performed Projects in India under Japanese ODA**

S. No.	Project Name	Sector	Project Start Year	Project Evaluated	Loan Amount Million Yen	
					Approved	Disbursed
1	Dhauliganga Hydroelectric Power Plant Construction Project(I)	Electrical Power	1995	2011	5665	4976
2	AttappadyWastland Environmental Conservation Project	Development Planning Forestry/Forest Preservation	1995	2011	5112	4867
3	West Bengal Transmission System Project (I)	Electrical Power	1995	2011	11087	10485
4	Simhadri and Vizag Transmission System Project (I)	Electrical Power	1997	2011	10629	10436
5	Dhauliganga Hydroelectric Power Plant Construction Project (II)	Electrical Power	1997	2011	16316	16312
6	Punjab Afforestation Project (I)	Forestry / Forest Preservation	1997	2011	6193	6188
7	Manipur Sericulture Project	Sericulture	1996	2011	3962	3941
8	Simhadri and Vizag Transmission System Project (II)	Electrical Power	2002	2011	6400	5476
9	West Bengal Transmission System Project (II)	Electrical Power	2002	2011	3127	2251
10	Punjab Afforestation Project (II)	Forestry / Forest Preservation	2002	2011	5054	4809
11	Dhauliganga Hydroelectric Power Plant Construction Project (III)	Electrical Power	2003	2011	13890	12048

Source: Ex-post Evaluation Reports of Various Projects, JICA