Chapter 3
South-South/Triangular Cooperation and Capacity Development

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1. ProSAVANA Project as an Example of Triangular Cooperation

In recent years, the ProSAVANA Project being carried out by Japan, Brazil and Mozambique has become a focus of wide attention. The project aims to develop agriculture in Mozambique's tropical savannah, drawing on Brazil's "Cerrado" development as a reference. The "Cerrado" tropical savannah in Brazil, once regarded as a barren plateau, has been transformed into one of the world's largest and most productive crop-agricultural regions. Brazil-Japan cooperation stretching back almost three decades to the mid-1970s was one of the factors which contributed to the process. The ProSAVANA Project is an agricultural development assistance program targeting synergistic effects from both promoting agricultural investment by the private sector and raising the incomes of the small-scale farmers. The program also aims to generate synergies from the development of agriculture and investment in infrastructure, keeping in mind a concrete proposal at the national level of the principles of "responsible agricultural investment" led by Japan.[1]

The idea behind the ProSAVANA project dates back to 2009. At a top-level meeting between Brazil and Japan at the L'Aquila Summit in July of that year, an agreement was reached to "develop agriculture in African tropical savannahs through Japanese-Brazilian cooperation by building on the achievements of the Cerrado agricultural development cooperation." Following this agreement, preparations were carried out in Brazil, Japan and Mozambique, and the ProSAVANA Project for cooperation to develop African tropical savannahs through collaboration between Japan and Brazil was launched in 2011.

[1] "Responsible agricultural investment (RAI)" was proposed by Japan on the occasion of L'Aquila Summit in July 2009. In September, 2009, Japan, World Bank, FAO, UNCTAD and IFAD organized a round-table discussion on "Promoting Responsible International Investment in Agriculture." These four international organizations made a joint proposal on RAI Principles in May 2010. (See RAI Knowledge Exchange Platform.)

The ProSAVANA Project was spotlighted internationally at the G20 meeting in November 2011. This attention was initiated by Bill Gates, co-chair of the Bill and Melinda Gates Foundation, who proposed to the leaders of each country the plan "Innovation with Impact: Financing 21st Century Development," in which he endorsed the ProSAVANA Project as a good example of an innovative partnership. Thereafter, in her keynote speech at the opening of the Fourth High Level Forum on Aid Effectiveness, a ministerial level meeting held in Busan, Korea, US Secretary of State Hillary Clinton described the ProSAVANA project as a model for triangular cooperation between a developed nation, an emerging nation and a beneficiary nation.

In May 2012, at the G8 meeting at Camp David in the United States, an agreement was reached on a New Alliance for Food Security and Nutrition targeting Africa. Six countries, including Mozambique, were selected as partner countries with the country plan for Mozambique to be co-chaired by Japan and the United States. The New Alliance can be said to share a common directionality with the ProSAVANA Project, for example, insofar as both are collaborations between the public and private sectors.

This chapter aims to consider the significance and challenges of South-South / Triangular cooperation and capacity development, both of which are features of Japan's official development assistance (ODA), by looking at specific case studies.

The ProSAVANA Project discussed above is an instance of full-scale triangular cooperation that is being implemented as part of the Japan-Brazil Partnership Program (JBPP). This chapter begins with a discussion of the features of South-South/Triangular cooperation, as well as the background to this type of cooperation taking the ProSAVANA Project as an example.

2. Japan's South-South/Triangular Cooperation

2-1 Growing Interest in South-South/Triangular Cooperation

In recent years, emerging nations have gained increasing prominence in the international community, notably for the increasing roles they are playing. As a whole, trade involving developing nations has risen to the point where it now occupies one third of all global trade, and the growth in trade by emerging nations is particularly remarkable. Such being the circumstances, South-South cooperation – that is, cooperation between

developing nations, and particularly cooperation provided by emerging nations to other developing nations – has played a significant part and hopes are high for the role of this type of cooperation. Moreover, the importance of triangular cooperation, whereby a traditional donor nation (a developed nation) assists this kind of South-South cooperation, is also being recognized. South-South/Triangular cooperation are often mentioned together as a single unit.

The Busan High Level Forum held in 2011 strongly reflected the changes of recent years. The Busan Partnership for Effective Development Cooperation emphasized the importance of South-South cooperation growth, and enumerated the following four points as specific methods for boosting this type of cooperation: 1) scaling up the use of triangular approaches to development cooperation; 2) making fuller use of South-South and triangular cooperation, recognizing the success of these approaches to date and the synergies they offer; 3) encouraging the development of networks for knowledge exchange, peer learning and coordination among South-South cooperation actors; and 4) supporting efforts to strengthen local and national capacities to engage effectively in South-South and triangular cooperation.[2]

Japan is a pioneer in South-South/Triangular cooperation, having started third country training programs as long ago as 1975. Japan started partnership programs (described below) for South-South/Triangular cooperation with several countries in 1994, and thereafter policies emphasizing triangular cooperation as an effective method for promoting development cooperation were set forth in the new ODA Charter in 2003.

However, South-South cooperation also faces challenges. In particular, concerned organizations have pointed out that when numerous small-scale cooperation projects are conducted the burden on the recipient country increases (transaction costs increase), that it is possible to end up with a number of disparate cooperation projects with a low level of interrelatedness (fragmentation) and that, as a result of these factors, the benefits of the aid tend to be limited.[3]

Japan's international cooperation, with its long history of South-South/Triangular cooperation, involves comprehensive cumulative efforts to

[2] The Forth High Level Forum on Aid Effectiveness (2011), p.10

[3] Ree Hyunjoo (2011)

ensure that cooperation is effective. This experience is likely to provide a valuable reference for the countries that are now trying to expand this kind of cooperation.

In the rest of this chapter, this experience will be analyzed on the basis of specific case studies.

2-2 Development of South-South/Triangular Cooperation

Looking back at JICA's history of South-South/Triangular cooperation, it is apparent that thoroughgoing efforts are expended to implement effective cooperation. Initially, these efforts centered on third-country training programs but, in order to conduct the programs effectively, one of the basic patterns was to team up with one of the counterpart institutions, with whom JICA had conducted bilateral technical cooperation in the past, as a base for triangular cooperation projects. The merit of this is that these institutions have a high level of capability, particularly with respect to their level of technical skills, as a result of the long period of cooperation. These institutions can also be described as Centers of Excellence (COE) in their respective fields.

The existence of these kinds of institutions is invaluable for South-South/Triangular cooperation, and the possibility of working with them as bases for cooperation means that they are regarded as important assets for JICA, as well. Accordingly, it is important to know what kind of capacity development (CD) process these institutions have developed to increase their capabilities, and what kind of institution building they have conducted as part of this process, as well as what kind of cooperation was effective in facilitating these processes. This chapter touches upon these points later.

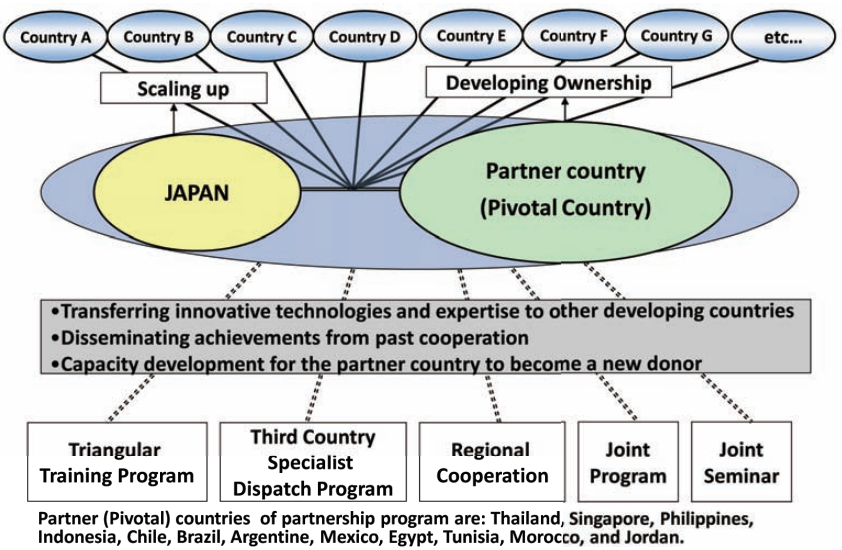
The High-Level United Nations Conference on South-South Cooperation in Nairobi in 2010 asked United Nations specialized agencies to help developing countries to establish or strengthen centers of excellence within their respective areas of competence.[4] Actually, from this perspective, Japan can be said to have contributed to the development of numerous centers of excellence in many countries around the world over a long period of time.

A second approach that deserves attention is the use of Partnership

[4] UN (2011), pp. 17-18

Programs (PP) implemented by Japan since 1994. Beginning with the Japan-Thailand Partnership Program in 1994, this approach has expanded steadily to the point where now agreements relating to partnership programs have been concluded with twelve countries (Thailand, Singapore, the Philippines, Indonesia, Chile, Brazil, Argentina, Mexico, Egypt, Tunisia, Morocco, and Jordan). The outcomes delivered by this approach have been enormous, although there is also variation from country to country. The partnership programs truly are frameworks for triangular cooperation teaming Japan, the pivotal (partner) country of South-South cooperation, and beneficiary countries in a well-coordinated fashion. One advantage of partnership programs is that cooperation can be implemented efficiently, as these programs enable triangular cooperation to be conducted systematically through regular meetings and discussions, and can also be combined with a range of schemes, such as triangular training programs, third-country expert programs, regional cooperation, joint programs, and so on. (See Figure 1.)

Figure 1: Partnership Program (Advanced/Structured Form of Triangular Cooperation)



Source: Prepared by the author

A third effective approach that has attracted increasing interest in recent years is the South-South/Triangular cooperation which is being conducted over a wide area and which is based on regional integration/

cooperation frameworks and so on. Specifically, wide area cooperation is being actively pursued in the ASEAN and in Central America. JICA is conducting regional cooperation projects directed at making an ASEAN community a reality and assisting the Master Plan on ASEAN Connectivity. The latter consists of assistance for the creation of the East-West corridor, the Southern corridor, and the sea-based ASEAN economic corridor. Cooperation directed at AUN/SEED-Net (the South East Asia Engineering Education Development Network, an autonomous sub-network of the ASEAN University Network) and the Asia-Pacific Development Center on Disability are also being conducted.[5]

In Central America, South-South/Triangular cooperation is being conducted over a wide area in collaboration with the Central American Integration System (SICA). This cooperation is based on the Tokyo Declaration and Action Plan adopted by the Japan-Central America Summit Meeting in 2005, and consists of cooperation in areas such as measures to tackle Chagas disease, mathematics education, disaster resilience, reproductive health, and quality and productivity improvements. In Africa as well, region-wide cooperation aimed at strengthening mathematics and science education (SMASE-WECSA) is also being conducted. Wide area South-South/Triangular cooperation based on platforms such as regional organizations is an effective approach for tackling challenges that are common to the whole region.

3. Capacity Development as Basis for South-South/Triangular Cooperation

Capacity development generally refers to the process whereby the capacity for addressing issues in a developing nation improves on aggregate at multiple levels, including the level of people, organizations and society as a whole.[6] The features of this approach are that it defines capacity as the ability for the individuals, organizations and social institutions of the developing nation to identify what the issues are for themselves and to address these issues by themselves, and that it emphasizes endogenous and autonomous efforts treating the concept of capacity inclusively, with a broad vision that includes, but is not limited to, individuals and organizations.

This perspective, which presupposes endogeneity and inclusiveness,

[5] See JICA (2012) and Ninomiya, Akiie (2010)

[6] This is how capacity development is defined in OECD/DAC (2006), and the UN also follows this definition. See Hosono, Akio et al. (2011), p.180

differs from the traditional perspective whereby technology is transferred in order to fill in a perceived gap resulting from a technology deficit; instead, donors are expected to try to cooperate by fulfilling the role of catalyst in this process. In this kind of process, the parties involved in capacity development, together with other stakeholders, are expected to work together to address issues and find solutions by first having a clear awareness of the issues to be addressed and then learning from one another (including donors).

This process can be thought of as a process of mutual learning and co-creation of innovative solutions (both technologies and systems), based on a thorough awareness of the issues to be addressed. Rather than simply transfer technology, the idea is that donors participate in learning and co-creation as actors entering from outside, and can contribute to capacity development by fulfilling the role of catalysts as "facilitators", so to speak.[7]

The significance of South-South/Triangular cooperation must also be considered from this perspective. Below, the case of the Cerrado development mentioned at the beginning of this chapter will be discussed from this approach.[8]

The nature of the technologies needed for the agricultural development of the Cerrado was not such that it could be transferred from the country of the North providing aid. That is to say, none of the Cerrado vegetation can be found in Japan, and Japan had almost no relevant experience in terms of how to go about transforming the Cerrado soils, which were not suitable for agriculture, into farmland. It is not an exaggeration to say that it was necessary to start from scratch. However, Japan did have technologies for analyzing soil and so on, and was able to make these technologies available. The development of varieties of soy beans and corn that could be grown in the tropical zone where the Cerrado is located also had to take place from scratch. Japan had no corresponding experience of tropical agriculture. This meant that the mutual learning and co-creation of innovative solutions emphasized by the capacity development process described above were literally essential.

[7] Hosono, Akio, et. al (2011)

[8] For details on JICA's cooperation for the Cerrado development, see *Hosono, Akio and Yutaka Hongo (2012)*.

Cerrado: Scenery before the Cooperation for Cerrado Agricultural Development
Sourse: Yutaka Hongo, JICA

The two technological innovations of soil improvement and variety improvement were prerequisites for agricultural development in the Cerrado, but it was the Brazilian Agricultural Research Corporation (EMBRAPA) and the affiliated Cerrado Research Center (CPAC) that made these innovations a reality. Cooperation continued from 1977 until 1999, with the Cerrado Agricultural Development Research Project implemented by JICA in two phases centering on CPAC, followed by the Cerrado Agricultural Environmental Conservation Research Project.

In 2006, Dr Edson Lobato, famed for his achievements in soil research, was awarded the World Food Prize. Dr Pilinio Itamar de Mello de Souza developed a revolutionary tropical variety of soy beans over a five year period. EMBRAPA named this variety the "Doko" soybean after Toshio Doko, a Japanese national who contributed greatly to strengthen Brazil-Japan economic relations and cooperation for many years. The many researchers from Brazil and Japan, including Lobato and Souza, are the ones who did the heavy lifting to make Cerrado agriculture a possibility. Through this process – which took more than twenty years – the efforts directed at technological innovation through collaboration between Japanese and Brazilian researchers can be said to have borne fruit. Souza

has said, "When I was young, I learned a great deal from the research attitude of the technical experts from Japan, including JICA specialist Yo'ichi Izumiyama (an expert in plant cultivation). Now it is my turn to set an example, as Izumiyama set an example for me."

Cerrado: Scenery after the Cooperation for Cerrado Agricultural Development
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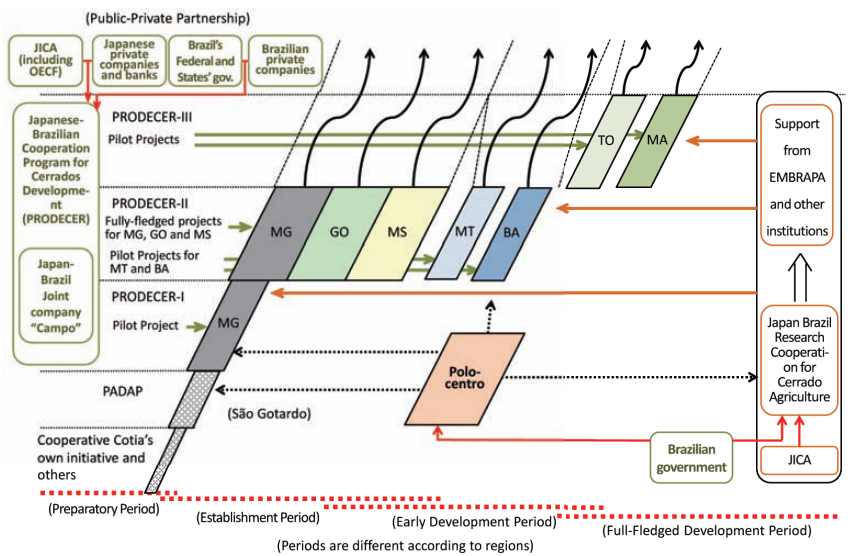
In this process, JICA's technical cooperation can be described as having contributed to the development of EMBRAPA by improving the capacity of CPAC. EMBRAPA has been extremely proactive in rapidly lifting its capacity through an approach that Dr. Eliseu Alves, one of the founders of EMBRAPA, describes as "the EMBRAPA Model". EMBRAPA is now a Mecca for tropical agriculture known all around the world, and it is a presence well-deserving of the appellation "Center of Excellence". As of 2010, the 8,100 EMBRAPA employees included 2,100 researchers, and the number of staff holding a doctorate degree (just a few when EMBRAPA was first inaugurated) stood at more than 1,600. The sequence of events leading to this standard of achievement can be described as a truly autonomous capacity development and institutional building process.

However, it was not just the organizational influence and capabilities of EMBRAPA that made Cerrado agriculture a reality. Agricultural producers, who actively took up new technologies and improved their own capabilities, made significant contributions, and agricultural cooperatives, such as the joint Brazil-Japan public-private company, Campo, and other local entities played a significant part in the dissemination of these technologies. Thus, Brazil can be said to have raised its capacity to promote the development of the Cerrado as a multilayered whole inclusive of individuals, organizations and social institutions, such as numerous producers and their organizations, with EMBRAPA conducting research and development and the federal government developing agricultural policies.

The agricultural development of the Cerrado itself was promoted by the Japan-Brazil Agricultural Development Cooperation Program (PRODECER). Financial cooperation from JICA and OECF was mobilized as part of this program. This program was carried out over a period of about twenty years, gradually scaling up in the three phases promoted by PRODECER; the first phase focusing on trial projects in Minas Gerais, the state where Cerrado agriculture began; the second

Figure 2: The Japan-Brazil Agricultural Development Cooperation Program (PRODECER)



Source: Prepared by the author

phase consisting of full-scale projects in Minas Gerais and two adjacent states as well as trial projects in the states of Mato Grosso and Bahia; and the third phase extending the program to the Cerrado agriculture frontier states of Tocantins and Maranhão (see Figure 2).[9]

Even after completion of PRODECER, the expansion of agriculture in the Cerrado has continued dynamically with progress in areas such as an expansion of the area of land under cultivation, improvements in productivity, diversification of the crops being produced, and expansion of the downstream value chain, such as agricultural processed goods. Brazil has overtaken the United States in terms of the production and export of soybeans, and is expanding its share of the global market for soy beans, corn and other grains. Moreover, the diversification of the agricultural and grazing industries has included labor intensive agriculture which, when combined with the expansion of the value chain, has meant that employment growth in the Cerrado regions has

The city of Lucas do Rio Verde, one of the focal points of the Cerrado agricultural development by PRODECER, as it appears today (2001). Environmental conservation zones where virgin nature has been preserved: dark green area running through left of center and crop fields (light green area) stretching to the horizon.
Photo source: Municipality of Lucas do Rio Verde

[9] For details on the development of Cerrado agriculture, see Hosono, Akio and Yutaka Hongo (2012).

exceeded that in other regions, so that the expansion of Cerrado agriculture has also contributed to reducing poverty and narrowing the gap between regions. Furthermore, from the beginning of Cerrado development there have been initiatives to protect the environment and ecosystems. In this sense, Cerrado agriculture can surely be described as inclusive, sustainable development.

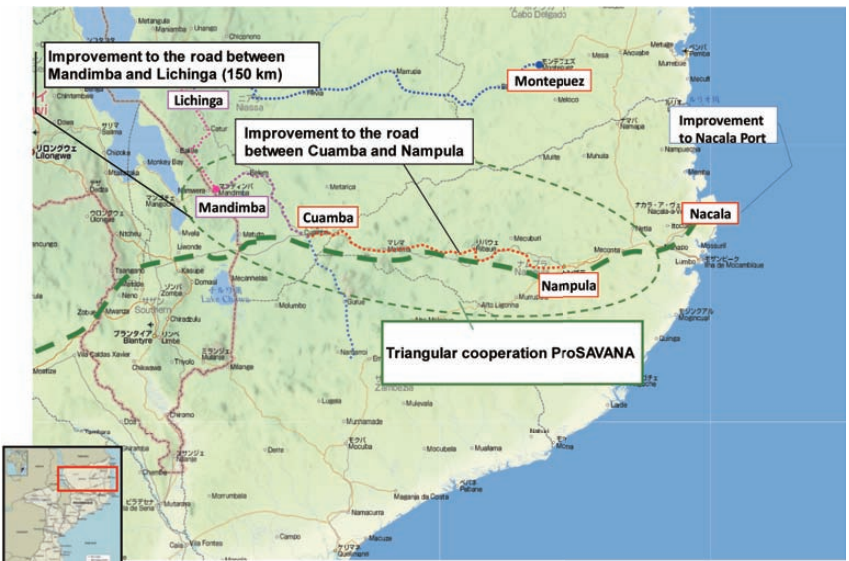
The expansion of Cerrado agriculture is described by former Brazilian President Lula as Brazil's agricultural revolution, and by a 2010 feature article in *The Economist* magazine as "The miracle of the Cerrado". Dr Norman Borlaug, who received a Nobel Prize for his part in the Green Revolution, endorsed Cerrado agriculture as "one of the great achievements of agricultural science in the 20th century".

4. Japan-Brazil Partnership Program and Expansion of Triangular Cooperation

As was mentioned earlier, the ProSAVANA Project is pursuing agricultural development in Mozambique through tripartite cooperation among Japan, Brazil and Mozambique, drawing on the experience of the Cerrado development. The benefits of having three countries implement the project are numerous and varied. Mozambique is an agricultural nation with 80 percent of the workforce engaged in agriculture. Brazil has the experience of developing Cerrado agriculture, and has an excellent stock of technologies for tropical agriculture. Also, both Brazil and Mozambique are former Portuguese colonies, so they share a common language. The regions targeted by the ProSAVANA Project are located in the northern part of Mozambique and have a great deal in common with the Cerrado regions in Brazil, particularly where the savannah extends around the Lichinga Plateau.

Progress has also been made in the form of improvements to infrastructure as a result of Japanese cooperation projects, and these are expected to have synergistic effects with the ProSAVANA Project. Asphalt paving for the roadway between Nampula and Cuamba (part of the Nacala corridor, one of the major arterial roads) is scheduled for completion during 2014. This project is funded by Japanese financial cooperation. Technical cooperation started at the Nacala port in April 2012, and it is also likely that financial cooperation will be implemented for the roadway upgrades between Cuamba and Lichinga. (See Figure 3.)

Figure 3: The ProSAVANA Project Teaming Japan, Brazil and Mozambique

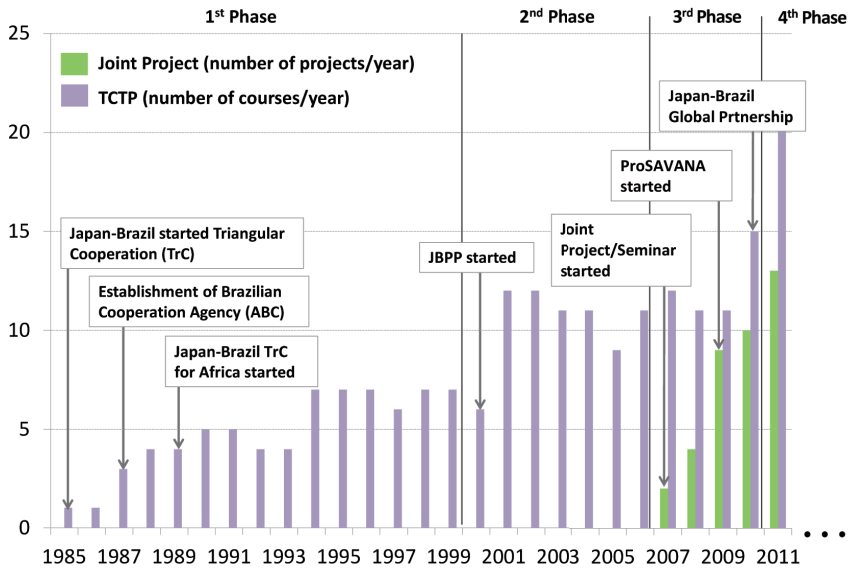


Source: Prepared by the author based on JICA's information

The ProSAVANA project is being implemented as part of the Japan-Brazil Partnership Program (JBPP). As discussed earlier, partnership programs are an effective approach for South-South/Triangular cooperation. The JBPP is one such program. But even before the start of the program in 1990 Japan-Brazil triangular cooperation was ongoing (1985) in the form of third-country training programs and other projects, so triangular cooperation joining Japan and Brazil as partners dates back more than twenty years. If triangular cooperation with Brazil prior to the conclusion of the JBPP in 1990 is taken as the first phase, then the second phase started with the inauguration of the JBPP, while the period starting with the joint projects and joint seminars in 2007 is the third phase, and the period since cooperation started based on the new concept of "Japan-Brazil Global Partnership for the solution of global issues" in 2010 can be viewed as the fourth phase.[10] From the start of the third phase until September 2011, Brazil and Japan had conducted 13 joint projects, 13 joint seminars, and 16 new third-country training programs. Not only have the numbers increased, the scale of each

[10] Sakaguchi, Kota (2011)

Figure 4: Japan-Brazil Triangular Cooperation



Source: Kota Sakaguchi (2011)

project has increased dramatically, and projects expected to have a large impact have been launched, one of which is the ProSAVANA project. (See Figure 4.)

Many other cooperation projects implemented through the JBPP deserve attention. The Japan-Brazil global network for protecting tropical rainforests is one of them. This project aims for truly global expansion, targeting South East Asia and non-Portuguese-speaking Africa, such as the Congo Basin. As the country with the largest tropical rainforest in the world, Brazil is carrying out advanced initiatives for protecting tropical rainforests, and bilateral cooperation between Brazil and Japan has also contributed to the formation of models for protecting tropical rainforests.

The Advanced Land Observing Satellite "DAICHI" (ALOS) operated by the Japan Aerospace Exploration Agency (JAXA) uses microwave sensors rather than optical sensors, and so using this data makes it possible to monitor tropical rainforests for illegal logging around the clock and even under conditions of heavy cloud cover. This has been highly effective in suppressing illegal logging, and in recent years the

Extensive forest of Amazon
Picture: Yutaka Hongo, 2009

Rainy season of Amazon. Rain shower to the forest.
Picture: Yutaka Hongo, 2009

JAXA's ALOS satellite
Picture: JAXA

ALOS 2 is scheduled to be launched in 2013.
Picture: JAXA

area of tropical rainforest lost in the Amazon has declined sharply. "DAICHI" is the only satellite orbiting the earth that uses this technology, and so the benefits of Japan's international cooperation can be seen on and above the earth.

This technology and experience is eagerly sought by countries with tropical rainforests around the world, and so Japan and Brazil are working jointly to implement triangular training such as "Monitoring tropical rainforests from space satellites" and "Spreading agroforestry to address fragmented forests".

There is also a great deal of interest in collaboration and cooperation between Japan and Brazil to improve public security in Central America. Since the year 2000, Japan and Brazil have implemented bilateral technical cooperation to extend local policing activities based on the *koban* ("police box") model in São Paulo state, which used to have a high crime rates. This cooperation project has contributed to concrete

outcomes such as a 70 percent reduction in the murder rate in the city of São Paulo. Japan and Brazil are working jointly to bring training programs for improved public security to the countries of Central America interested in the São Paulo model. Here, dialogs have been continuing since 2005.

Both of these two cases are driven by ongoing bilateral cooperation for capacity development and they are making progress in innovative technological solutions and associated systems, as well as institution building. South-South/Triangular cooperation continues to be actively conducted based on this experience, and with Brazil playing a central role.

5. Synergistic Effects between South-South/Triangular Cooperation and Capacity Development

The current interest in South-South cooperation is expected to grow even further in the future. But in order to avoid the fragmentation discussed earlier and the rising transaction costs resulting therefrom, the use of several effective approaches will most likely be necessary (such as those mentioned so far in this chapter) as well as assigning priority to those areas where the expected benefits peculiar to South-South/Triangular cooperation are more significant than can be achieved using traditional cooperation.

Concrete examples of this cooperation are areas of cooperation that cannot be performed by developed nations. These are responses to issues faced by more than one developing nation, but for which developed nations do not have adequate expertise. Examples include areas such as tropical agriculture and tropical diseases. Developed nations tend not to be located in tropical climates, so they usually lack the store of technologies for agriculture peculiar to this kind of climate, for example. The case of Brazil's Cerrado discussed above is an excellent example of such an area, and it is unlikely that a developed nation would ever be able to accumulate a level of experience and technology equivalent to that which exists in Brazil. EMBRAPA receives cooperation requests from numerous countries. The same applies to measures to combat the illegal logging in tropical rainforests. Chagas disease, which is found in South America and Central America, is almost completely unknown in developed nations. Cooperation in these areas would be difficult if not for South-South cooperation, and the triangular cooperation that supports this South-South cooperation is highly

significant.

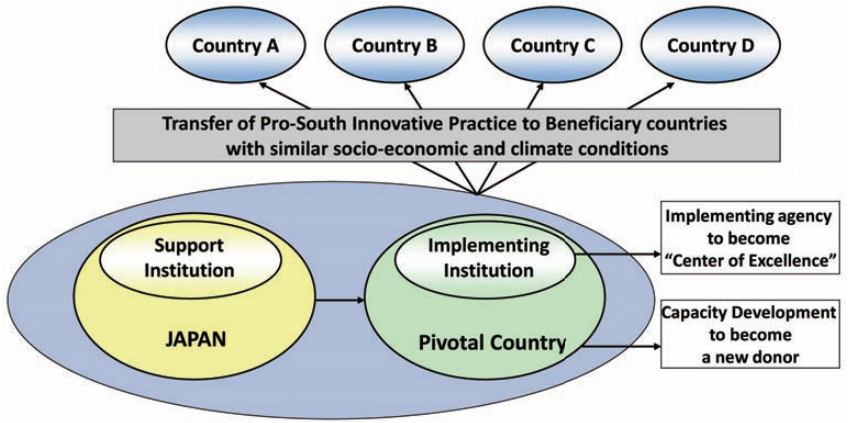
Similarly, developing nations generally have large numbers of poor people, and so have a need for low-cost housing, a situation that differs from what is found in developed nations. Earthquake-resistant housing, for example, would be expensive if constructed using the materials used in developed nations, and so meaningful cooperation cannot be achieved without innovating in ways appropriate to the reality of the developing nation. However, the lost-cost building materials that are available in developing nations are not necessarily known in developed nations.

For many base-of-the-pyramid (BOP) businesses as well, it is necessary to innovate by developing products and services that are appropriate to the reality in developing nations, so that these products and services can be the ones the poor really need, and can afford to actually buy. The well-known Olyset Net mosquito net, which is increasingly being adopted as part of the fight against malaria, is one such example. This kind of technology and experience has an important significance in mutual cooperation between developing nations. This can be described as an area where there is huge potential for the impact of South-South/Triangular cooperation.

Thus, the particular importance of the kind of capacity development perspective described earlier should be emphasized once again when it comes to tackling challenges specific to developing nations. This is because these challenges cannot be solved simply by transferring technology from developed nations. This point should be explored further, taking as an example the construction of earthquake-resistant buildings that can be provided affordably.

The huge earthquake that struck Mexico in 1985 caused massive damage in many places, including in the capital, Mexico City. Afterwards, the Japanese government cooperated with the establishment of CENAPRED (the National Center for the Prevention of Disasters), as well as the building up of capacity and creating systems. In recent years, CENAPRED has raised the level of its functions as a center of excellence in this area. In particular, CENAPRED fulfilled an important role in the implementation of the TAISHIN project in El Salvador, based on the framework of the Japan-Mexico Partnership Program (JMPP).

Figure 5: Triangular Training Program (Third Country Training Program)



Source: Prepared by the author

El Salvador is one of the most vulnerable countries in the world when it comes to natural disasters. The huge earthquake that struck El Salvador in 2001 left many injured and homeless. About 60 percent of the homes that were destroyed belonged to the poor. The TAISHIN project was started out of recognition of the importance to develop houses with good earthquake-resistance for low-income earners. The project, which started with a process of mutual learning oriented at solving problems, involved researchers from El Salvador (mainly from the University of El Salvador and "José Simeón Cañas" Central American University), Mexican experts from CENAPRED and Japanese experts from the Building Research Institute of Japan.

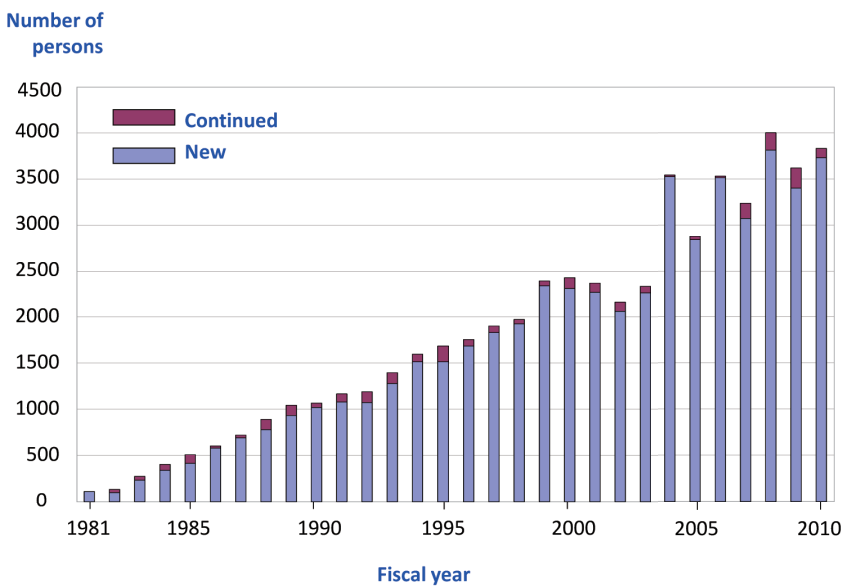
Of the building materials currently available, among the cheapest and most readily available are the sun-dried bricks known as "adobe" and "soil cement" (a building material for economizing on the amount of cement used through its 10-parts soil and 1-part cement ratio. Japan has no experience with these materials. Other circumstances were also significantly different from those in Mexico. These materials were used, together with the expertise from Mexico, to produce various combinations of raw materials and designs which were tested for anti-seismic properties in seismic testing laboratories of each university. The laboratories were capable of testing large structures. After numerous tests, the researchers were able to develop an earthquake-resistant model

house that could be produced at low cost. This is an excellent example of technical innovation and the creation of expertise through collaboration. South-South cooperation extended further to other Central American countries and elsewhere, such as Haiti. Thus, a center of excellence was first created in Mexico, and the capacity development process then progressed further in El Salvador.

The various examples that we have touched upon so far in this chapter illustrate the necessity of a capacity development perspective in South-South/Triangular cooperation. Normally, "knowledge exchange" is emphasized as a method of South-South/Triangular cooperation, but from these examples we can go further and see the importance of cooperation directed at mutual learning, collaborative problem-solving, and the co-creation of innovative technologies and expertise.

It is known that centers of excellence also make progress in terms of capacity development as institutions through the process of South-South/Triangular cooperation. For example, the Faculty of Marine Science of Chile's Universidad Católica del Norte developed as a center of excellence in Latin America in the area of shellfish

Figure 6: Triangular Training Programs Organized by JICA

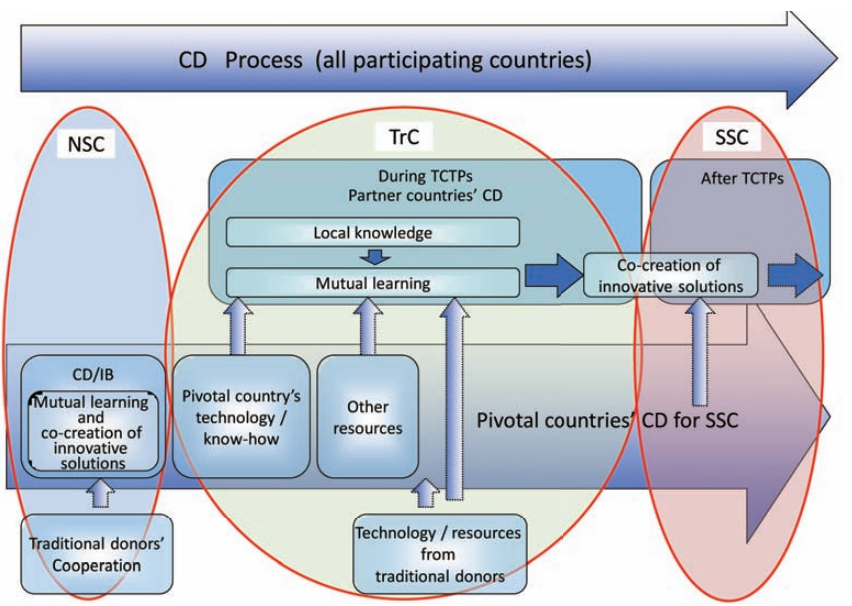


Source: JICA

aquaculture. The starting point was the beginning of a project to cultivate Chilean scallops in 1981. Aquaculture had not been conducted until then, but a scallop aquaculture industry was established in about eight years, and Chile is now the third largest exporter of scallops. There has been mutual learning between Chilean researchers, Japanese specialists, Chilean aquaculture companies and fishermen, as well as problem-solving initiatives and an accumulation of research. These paved the way to development of aquaculture technologies appropriate to local conditions. This can be regarded as having been an endogenous, inclusive capacity development process.

Thereafter, South-South/Triangular cooperation started in 1988, as the Faculty began the process of capacity development as an international cooperation institution. In the twenty year period up until 2007, the Faculty conducted a third-country training program, accepting 400 trainees from 16 Central and South American countries, selected from 1200 candidates. In this process, the Faculty built a strong network with other relevant parties attempting to develop aquaculture as an industry in Central and South America. Moreover, in the process of carrying out

Figure 7: Seamless CD Process toward SSC/TrC



Source: Prepared by the author

cooperation projects, the Faculty was able to learn about the state of development of the aquaculture industries in each of these countries in great detail. This laid the groundwork for the successful implementation of even more advanced cooperation projects in Peru, Ecuador, Brazil, Columbia, Venezuela, and El Salvador. The crucial factors that made this possible were trust, the network of relevant parties built up over a long time, and a detailed understanding of the local conditions. This suggests that the Faculty's capacity to function as a center of excellence grew over time as a result of its involvement in South-South/Triangular cooperation. (See Figure 7.)

In this way, triangular cooperation also fulfills a role in assisting the process of countries becoming new donors. In the cases described above, the assistance was directed at enabling centers of excellence in specialized areas to become donors, but it should be pointed out that triangular cooperation also leads to a strengthening of the capacity for cooperation of the institutions in developing nations that provide aid through South-South cooperation. This is a particularly significant benefit in partnership programs.

6. Conclusion

To sum up, the following points are likely to be important if we are to aim for the further expansion of South-South/Triangular cooperation. Firstly, in those areas where South-South/Triangular cooperation offers comparative advantages that only these forms of cooperation can provide, we should aim to draw out these benefits to the greatest extent possible. Secondly, we should make full use of proven approaches that have delivered successful outcomes so far, such as effective triangular training programs organized around Centers of Excellence, partnership programs, and wide-area approaches collaborating with organizations for regional integration/cooperation as platforms. Thirdly, we should make the "capacity development" perspective mainstream in South-South/Triangular cooperation as well. Japan is a pioneer in South-South/Triangular cooperation, and has a great deal of valuable experience in this area. Moreover, the existence of Centers of Excellence in various countries that have been made possible through Japan's previous cooperation projects is a key asset for future South-South/ Triangular cooperation. It is expected that these advantages can be used to further strengthen and scale up South-South/ Triangular cooperation.

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