

# Study on Japanese Medium and Small Size Construction Companies Expanding Business to Overseas Market

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**Abstract:** Japanese government announced “High Quality Infrastructure Export Initiative” in 2013 to encourage Japanese companies which are related to construction and plant machinery industries to increase export of infrastructure business.

This policy mainly focuses on large size companies at early stage, but currently Japanese government also enhances support on provincial medium and small size companies to expand business into overseas market in order to revitalize provincial areas in Japan which suffer from population decrease and economic stagnation by use of Japanese Official Development Assistance (ODA).

The authors focus on these medium and small size construction and its related companies (including material supplier) and analyzes their past activities aiming to expand business into overseas market competing against other developed countries and emerging countries’ competitors.

This paper indicates that initial cost has higher priority than net present value including maintenance cost and lower cost conventional construction methods are prevailed at the end although advantageous points of Japanese “High Quality Infrastructure” are shown as lower net present value and lower maintenance cost.

From technical, commercial and institutional points of view, several conditions and tasks are extracted and indicated through these analyses in order to achieve the goal of how Japanese middle and small size construction and its related companies can expand business to overseas market.

**Keywords:** Medium and Small Enterprise Company, Untied ODA, Tied ODA, Rockfall Protection Countermeasure, High Quality Infrastructure Initiative, Life Cycle Cost, Net Present Value

## 1. Introduction

Japanese government decided to initiate so called “infrastructure system export strategy” and announced “High Quality Infrastructure Export Initiative” as one of the most important measures for “International development strategy” and “Japan revitalizes strategy” in 2013. Medium and small size projects dealt by medium and small size enterprises in corporation with local governments in recipient countries were also chosen for Japanese government to support to encourage export by use of Japanese Official Development Assistance (ODA) Program.

However, overseas activities of Japanese medium and small size enterprises are limited although number of enterprises and employees is overwhelmingly larger than Japanese large companies. Construction industries are the same situation as the above trend.

A Japanese company for which the first author works currently does not belong to medium and small size enterprises but belongs to semi-large size enterprise with approximately 70 billion Japanese Yen yearly sales.

The author is responsible for overseas sales and has many opportunities to talk with medium and small size enterprises. Through this experience and position, the author focuses on the overseas activities of Japanese medium and small size construction related enterprises and analyzes technical, commercial and institutional points comprehensively.

There are several types of business scheme for overseas activities such as export, use of agent or distributor, representative office, branch office, subsidiary (manufacture, engineering service, and construction), joint venture, license. Usually, overseas business starts from export, and gradually shifts to localization as a local enterprise.

Japanese government provides several types of support programs for proceeding overseas business

such as market research, market strategy, start up, business continuity and exit. The case studies on these support programs of Japanese government are described in this paper.

One of the most efficient support programs is to utilize Overseas Development Assistance (ODA). Several types of ODA programs provided by Japanese government are introduced and how to utilize those programs is pointed out in this paper.

## 2. Japanese Overseas Development Assistance

The history of Japanese ODA, types of programs, related agencies and organizations are described in this section.

### 2.1 Post Second World War History of ODA

ODA scheme of western countries was initiated following establishment of Bretton Woods system consisting of International Bank for Reconstruction and Development (IBRD), International Monetary Fund (IMF) and General Agreement on Tariffs and Trade (GATT) in 1945 lead by United States and United Kingdom after the second world war.

Japanese government executed the post war compensation projects providing 500 billion Japanese Yen in total from 1955 to 1977 and those compensation projects were executed by only Japanese companies as main contactors.

Meanwhile, Japan joined the World Bank group (IBRD) for getting finance in 1952, and started main infrastructure projects such as Meishin expressway, Tokaido bullet train, Tomei expressway. The loans for those projects were provided until 1966 and Japan had completed to pay back all loans to the IBRD in 1990.

On the contrary, Japan joined the sub organization Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD) in 1964. The first bilateral Yen loan as ODA was provided to India by Japanese

government in 1958 after the post second world war.

Overseas Economic Cooperation Fund (OECF) was established in Japan in 1961.

Overseas Technical Cooperation Agency (OTCA) was established in 1962 and transformed to Japan International Cooperation Agency (JICA) with merger of other related organizations in 1974.

The post war compensation in 1950's and Yen loan ODA succeeded in 1960's for Philippines, Burma, Indonesia, and South Vietnam. Private investment of Japanese enterprises to such countries also increased accordingly.

## 2.2 Transition of Tied, Untied Conditions of ODA

Tied condition of ODA i.e. only Japanese enterprise are eligible for a prime contractor is one of the most efficient conditions for Japanese enterprise to get projects.

In 1966, tied condition had been set for all Yen loan ODA projects since OECF started ODA for the time being. In 1971, first untied condition was set for the investigation project of offshore oil field for Myanmar. Untied condition means that foreign enterprise which resister in OECD countries and recipient country are eligible for a prime contractor in addition to Japanese enterprise. Price competition under untied condition is much harder than tied condition.

In 1975, untied condition had been enacted for Less Development Countries (LDC)'s ODA as general principle among DAC countries.

In 1978, general untied rule had been enacted as OECD export credit arrangement.

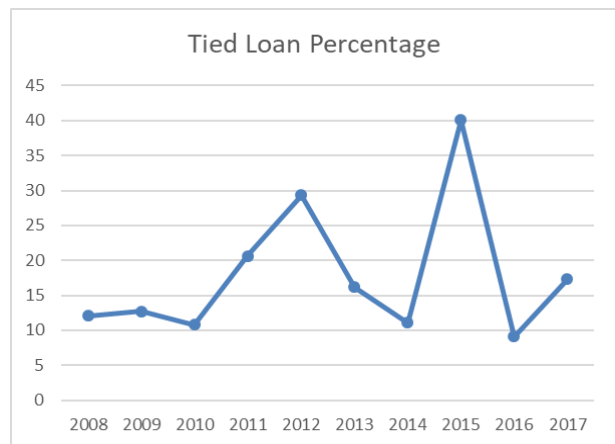
In 1996, untied ratio of Yen loan reached up to 100%.

1998, tied condition was restored by Special Yen Loan Program which had 3 years limited terms and 600 billion Japanese Yen loan amount in total.

In 2002, Special Terms for Economic Partnership (STEP) has been enacted as a tied Yen loan ODA

permanent program.

Tied loan percentage in Yen loan ODA in the last 10 years is shown in Figure No.1 Yen loan tied percentage in last 10 years.



**Figure No.1 Yen loan tied percentage in last 10 years**

Tied ratio of Japanese ODA has been steadily achieved at a certain level.

## 2.3 Competent authorities of Japanese ODA

Grant aid program is assigned with the authority to Ministry of Foreign Affairs. Yen loan program is assigned with the authority agreed by three ministries composing of Ministry of Foreign Affairs, Ministry of Economy, Trade and Industry, and Ministry of Finance.

Other ministries have no authority to determine the projects, however each ministry is involved in ODA by use of its specific field. For example, Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has ten sections which deal with overseas affairs such as construction, transportation, aviation, port respectively. MLIT has been merged by two ministries Ministry of Construction and Ministry of Transportation in 2001. Therefore, ten sections have been existing and working respectively even today.

JICA is a main implementation organization to execute ODA projects under the relevant ministries.

In addition to JICA, although size and budget is small, consulting companies such as Japan International Cooperation System (JICS) and Crown Agent are assigned execution of procurement for urgent disaster assistance as ODA projects.

#### **2.4 Public organizations to support overseas business**

Japan External Trade Organization (JETRO) is the agency to support private enterprises for export, import and investment to foreign countries.

National Center for Industrial Property Information and Trading (INPIT) is the agency to protect intellectual properties.

Japan International Training Cooperation Organization (JITCO) and Organization for Technical Intern Training (OTIT) are the agencies to arrange permission of foreign technical interns.

There are many supporting agencies and organizations for medium and small size companies as indicated above. However, function of each agency or organization is limited and specified area. Therefore, it is important for medium and small size companies to recognize the function of each agency and organization and integrate these functions.

### **3. Special Yen Loan Program**

The process of how to establish Special Yen Loan Program in 1998 is described in this section.

The first author used to work for a Japanese steel company which was one of the biggest Japanese steel manufacturing companies and the author was responsible for overseas suspension bridge projects.

That Japanese company participated in the tender for construction of Tsing Ma Bridge in Hong Kong in 1991, and Jiangyin Bridge in China in 1996 both of which were world-known suspension bridges.

However, Cleveland Bridge Company (CBC) in United Kingdom got the both projects.

Tender was conducted several times for Jiangyin

Bridge project repeatedly. A Japanese company's first and second bid price was lower than CBC. However, Jiangsu Province Government chose CBC for the contractor of the project in the end.

During the evaluation process, it was found that UK government proposed combined finance package both supplier's credit and grant aid.

Development Assistance Committee (DAC) prohibits governments of DAC members provide such combined finance because inhibition of international commercial competition.

The author requested Ministry of Economy, Trade and Industry (METI) to provide countermeasure to meet the same financial conditions as UK's.

This is called "matching" which is formally recognized rule in DAC. METI immediately decided to provide the equivalent financial condition.

Although Jiangsu Province Government chose CBC in the end, METI recognized Japanese long span suspension bridge construction technology is one of the most advanced technologies in the world and METI also recognized that such advanced technologies were strong tools for Japanese companies to expand business overseas.

After this event, Asian currency crisis occurred in 1997. METI talked to the first author to make new ODA program for restoration of damaged Asian economies by use of Japanese advanced technologies based on the experience of the above event.

Main points of the author's proposal were that eligible contractors were only Japanese i.e. tied ODA, more than 30 percent of project loan amount should be purchased from Japanese origin, technologies should be selected among Japanese advanced technologies such as long span suspension bridges.

Special Yen Loan Program was finally enacted by Japanese cabinet based on the author's proposal. Although the term was limited only 3 years and the

total amount was 600 billion Japanese Yen, it was significant to restart tied Yen loan program.

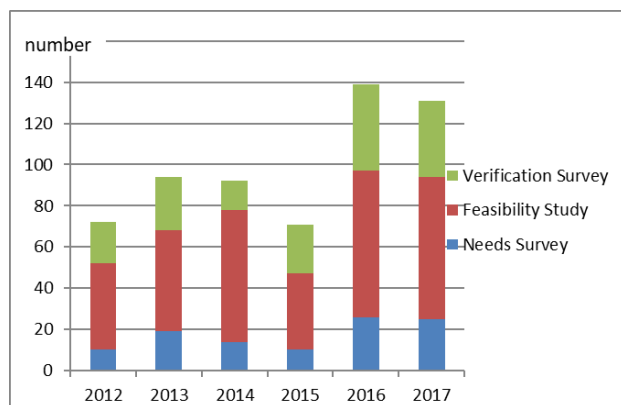
Following this Special Yen Loan Program, Special Terms for Economic Partnership (STEP) has been enacted as a tied Yen loan ODA permanent program in 2002.

#### 4. The Programs for supporting overseas business expansion of SMEs by JICA

JICA has started the Programs for supporting overseas business expansion of Japanese Small Medium Enterprises (SMEs) since 2012.

##### 4.1 Outline of the Programs

The Programs compose of 3 phases which are Needs Survey, Feasibility Study, and Verification Survey with the Private Sector for Disseminating Japanese Technologies.



**Figure No.2 Number of the contracts for SMEs Programs**

It is general that SMEs appoint Japanese consulting firms to support implementation of such activities.

The Programs have been expanding gradually following the Japanese Government Cabinet decision “Infrastructure System Export Strategy” in 2013 as shown in Figure No.2.

##### 4.2 Task to be improved on the Programs

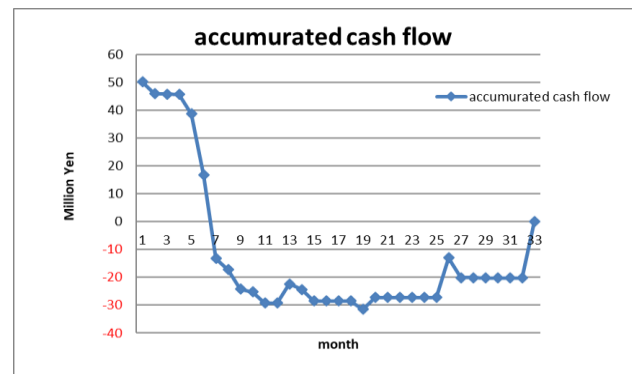
According to the monitoring report on SMEs

after execution of the Programs conducted by JICA, most of SMEs were satisfied with the Programs, but the procedure is so complicated and volume of documentation is so large that SMEs should assign works and pay large amount of fee to the consulting firms for execution of the Programs.

According to the first author’s experience of one of the Feasibility Study works, total submitted documents volume reached 493 pages, meeting with JICA reached 30 man hours, and traveling to the relevant country reached 80 man-days for the contract with 19 months period and 28 million Yen.

The above heavy burden of work may disturb the main domestic business of SMEs due to human resources of SMEs are very limited.

The first author conducted simulation of cash flow of Verification Survey with the Private Sector for Disseminating Japanese Technologies according to the standard contract conditions stipulated by JICA, and which simulation is shown in Figure No.3.



**Figure No.3 Cash Flow of Verification Survey**

This cash flow simulation is calculated on assumption that receiving money condition is stipulated in the standard contract, total contract amount is 111 million Yen, payment condition to a consulting firm is progress payment. Cash flow becomes negative at 7th month from the contract made until the final reception of the money at 33th month.

It is concerned that many SMEs do not have strong financial positions and salaries of SMEs

employee are not covered by this Program.

## 5. Japan Association of Small and Medium-sized enterprises for Overseas Construction

Japan Association of Small and Medium-sized enterprises for Overseas Construction (JASMOC) has been founded in 2017 hosted by Ministry of Land, Infrastructure, Transport and Tourism (MLIT) for the purpose to support Japanese middle and small size construction and its related companies to expand business to overseas market.

### 5.1 Outline of JASMOC

At the time of establishment, numbers of member companies were 68, and Visiting Professor of Tokyo City University Prof. Shunji Kusayanagi has been nominated as the chairman of JASMOC.

Number of member companies became 164 as of June 2018, so that high expectation on the activities of JASMOC can be understood.

### 5.2 ODA sub-committee

ODA sub-committee in JASMOC was set up in August 2018, and the first author was appointed as one of secretaries.

The followings are the main subjects to study in this committee.

- ✓ How to incorporate the target products into specification of ODA project
- ✓ How to shorten leading time of ODA project prior to construction
- ✓ Top sales of Japanese government focusing on SMEs
- ✓ Strengthening cooperation with other ministries to support JASMOC activities

Strong points of SMEs are large influences on local governments and economies in Japan. The above subjects are to be discussed and realized in cooperation with local governments. JICA also has a program for joint project management by private and

public sectors such as water supply, road construction and maintenance.

## 6. Case Study 1: Untied ODA Yen Loan Project

Main Yen loan ODA projects are provided with untied condition although STEP program has been enacted in 2002.

One Japanese untied Yen loan project for rockfall protection was concluded in 2012 for the purpose of introduction of Japanese national disaster countermeasure technologies to a country in south Asia.

A Japanese civil engineering consulting company carries out study and selected the rockfall countermeasure technology invented by a Japanese company and adopted in technical specification of the tender document of the Project.

Instructions to Bidders (ITB) and Bid Data Sheet (BDS) stipulated that alternative bid were not accepted. In addition, FIDIC Red Book MDB (2010) was adopted for the standard conditions of the contract. Particular Conditions of Contract also stipulated that alternatives were not accepted.

In 2016, a local contractor signed and executed the contract as a prime contractor.

Afterwards, the contractor proposed alternative rockfall countermeasure technology which was designed by an Italian company.

The consultant and the project owner accepted the alternative as the proposed technology was equivalent to the original specification and could be adopting value engineering clause.

**Table No.1 Comparison of Rockfall Countermeasures**

	Original	Alternative
Post height	4 ~8 m	2 ~5 m
Post interval	Max. 30 m	Max.11 m
Mesh	Chain link type wire diameter = 5 mm	Chain link type wire diameter = 2.7 mm
Coating	Zink galvanizing+ Modified Saturated Polyester Resin	Zink Aluminium Alloy galvanizing

However, the two countermeasures have apparently different technical features as shown in Table No.1 and the original purpose of the project i.e. introduction of Japanese national disaster countermeasure technologies to that country was not realized.

Foreign prime contractors often try to change the design with lower cost although products and technologies of Japanese SMEs are adopted in the specifications of the projects and alternatives are not accepted due to hard price competition under the condition of untied Japanese Yen loan projects.

## 7. Case Study 2:

### Philippines Technical Cooperation Project

Philippines government have decided 160~180 billion US\$ for public infrastructure investment during 2017 to 2022 (6 years) under Build Build Build Plan lead by the President Duterte.

Economy of Philippines has been achieving high economic growth rate 7% per year recently.

Under this economic situation, Department of Public Works and Highways of Philippines (DPWH) has been evaluating and trying to introduce high quality technologies and products gradually.

One of these activities is Technical Cooperation Project (TCP) which has been carried out from 2007 to 2019 granted by Japanese ODA for the purpose of improvement of quality management for highway and bridge construction and maintenance.

A Japanese consulting company was selected by JICA to introduce Japanese high quality technologies to DPWH. And that Japanese consulting company conducted monitoring local contractor's bidding process for the pilot projects and provided maintenance manuals to DPWH.

Philippine government allocated money on the pilot projects from its own budget.

Mainly Japanese SMEs provided products and supervisors with local prime contractors.

Rockfall countermeasure of a Japanese company was also selected for this pilot project and 3 pilot projects were executed. One of the pilot projects is shown in Picture No. 1

Following these pilot projects, Bureau of Research and Specification (BRS) under DPWH revised their standard of specification for highways, bridges and airports so called "Blue Book" and the specification of a Japanese company's rockfall countermeasure was adopted as one of rockfall countermeasures in "Blue Book" successfully.

This adoption is significant because Japanese rockfall countermeasure has been recognized as one of Philippines rockfall countermeasure standards.



Picture No.1 Pilot Project in Baguio-Tublay

DPWH evaluates Japanese high qualities of the products resulting from the pilot projects, and many projects using Japanese products are expected to be realized in the near future.

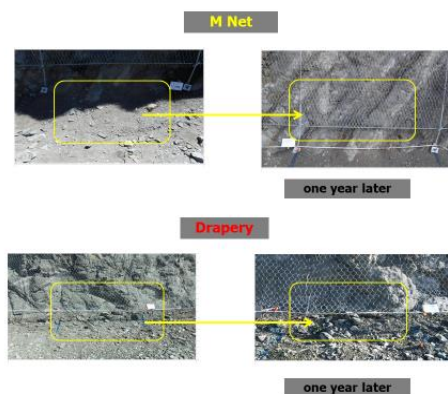
However, credit management is one of the critical issues for Japanese SMEs suppliers. Financial conditions of local prime contractors are often vulnerable and sometime are not disclosed. Payment tends to be delayed and collection of payment is important task for SMEs.

## 8. Case Study 3: Georgia Disseminating Japanese Technology JICA Collaboration Program

A Japanese company executed Collaboration Program with the Private Sector for Disseminating



Japanese Technology for Road Safety against falling rocks in Georgia financed by JICA in 2016 and 2017.



**Picture No.2 Comparison of “M Net” & “Drapery”**

That company installed its unique active rockfall countermeasure “M Net” system next to the covering net system so called “Drapery” system in Tbilisi city in Georgia.

That company monitored the performance of the two systems for one year after installation of the product.

No rockfall occurred after one year in the area covered with “M Net” system. On the contrary, some fallen rocks were found in the area covered with “Drapery” system shown in Pictures No.2.

This program aimed to demonstrate Japanese high quality technology compared with conventional

system. JICA and Georgia government recognized the high performance and merit of “M Net” system.

Following this program, this “M Net” system was adopted partially for STEP tied Yen loan project “East West Highway Construction Project Phase II” composed of tunnels and steel girder bridges.

Tender was conducted in 2018, but the project was cancelled due to the lowest tender price was much higher than the loan agreement.

SMEs as suppliers of products are not prime contractors. Therefore, SMEs cannot manage total projects even though their products are adopted as Japanese tied products partially like the above project.

## 9. Consideration on High Quality Infrastructure

Japanese government announced “High Quality Infrastructure Export Initiative” in 2013 to encourage Japanese companies which are related to construction and plant machinery industries to increase export of infrastructure business.

However, definitions of Japanese high quality infrastructure are not clearly indicated although some examples are demonstrated such as rapid bridge construction method, main cable dehumidification system of suspension bridge.

It will be the essential matter that the recipient countries of Japanese ODA recognize the value of Japanese high quality infrastructure. The execution ministries such as Ministry of Transportation, Ministry of Energy shall justify and explain the value of Japanese high quality infrastructure by numbers theoretically to Ministry of Finance and other authorities of the recipient countries.

For example, Japanese high quality infrastructure has features such as long service life, accuracy, high performance of speed, output, and so on although initial cost is relatively higher than other conventional methods and technologies provided by China, South Korea, or local contractors.



The merit of these features shall be converted and demonstrated by monetary numbers for the recipient countries of Japanese ODA to accept Japanese high quality infrastructure.

People personally and private sectors evaluate and purchase higher performance goods and services such as Japanese cars easily by their own decisions if they can provide money. However, governmental decision processes require more documentations and consensus to justify high initial cost.

### 9.1. Consideration on Rockfall Countermeasure

A Japanese company for which the author works invented its unique active rockfall countermeasure “M Net” system by use of thick net and many short anchors. This method has been prevailed widely in Japan because maintenance or replacement are not required or minimized for more than 20 years according to past construction records in Japan in comparison with covering net system so called “Drapery” system.

Initial cost of “M Net” is higher than “Drapery” because more materials and parts are used to secure longer service life with minimizing maintenance or replacement.

The authors made Life Cycle Cost (LCC) study and its result is described on the table No.2. The numbers in this table are based on some assumptions such as discount rate, maintenance cost, replacement intervals. The initial cost is also assumed tentatively for the purpose of conceptional demonstration of comparison between two methods. Actual cost shall be calculated by use of the data reflecting the market price of each cost item such as material, transportation, labor respectively.

**Table No.2 Comparison Table between M Net & Drapery**

discount rate 10.0%

M Net					Drapery						
premise:maintenance & replacement maintenance initial cost x 1% replacement N.A.					premise:maintenance & replacement maintenance initial cost x 3% replacement every 3 years						
	initial cost US\$/m2	year	M&R %	NPV per year accumulated		initial cost US\$/m2	year	M&R %	NPV per year accumulated		
year 0	300	1.000		300.0	year 0	100	1.000		100.0		
year 1		0.909	1	2.7	302.7	year 1		0.909	3	2.7	102.7
year 2		0.826	1	2.5	305.2	year 2		0.826	3	2.5	105.2
year 3		0.751	1	2.3	307.5	year 3		0.751	100	75.1	180.3
year 4		0.683	1	2.0	309.5	year 4		0.683	3	2.0	182.4
year 5		0.621	1	1.9	311.4	year 5		0.621	3	1.9	184.2
year 6		0.564	1	1.7	313.1	year 6		0.564	100	56.4	240.7
year 7		0.513	1	1.5	314.6	year 7		0.513	3	1.5	242.2
year 8		0.467	1	1.4	316.0	year 8		0.467	3	1.4	243.6
year 9		0.424	1	1.3	317.3	year 9		0.424	100	42.4	286.0
year 10		0.386	1	1.2	318.4	year 10		0.386	3	1.2	287.2
year 11		0.350	1	1.1	319.5	year 11		0.350	3	1.1	288.3
year 12		0.319	1	1.0	320.4	year 12		0.319	100	31.9	320.1
year 13		0.290	1	0.9	321.3	year 13		0.290	3	0.9	321.0
year 14		0.263	1	0.8	322.1	year 14		0.263	3	0.8	321.8
year 15		0.239	1	0.7	322.8	year 15		0.239	100	23.9	345.7
year 16		0.218	1	0.7	323.5	year 16		0.218	3	0.7	346.4
year 17		0.198	1	0.6	324.1	year 17		0.198	3	0.6	347.0
year 18		0.180	1	0.5	324.6	year 18		0.180	100	18.0	364.9
year 19		0.164	1	0.5	325.1	year 19		0.164	3	0.5	365.4
year 20		0.149	1	0.4	325.5	year 20		0.149	3	0.4	365.9
total NPV						total NPV					

This simulation shows that Net Present Value (NPV) of “M Net” system i.e. LCC becomes lower than “Drapery” system after Year 14th.

In addition to that, this comparison does not include benefit such as loss of accident, casualty, traffic hindrance. Benefit by Cost (B/C) evaluation method has been adopted for the decision on public investment such as road and bridge in Japan.

Many recipient countries of Japanese ODA do not have sufficient budget and they do not have B/C evaluation system for public investment. Initial investment cost has high priority, and low tender price has high evaluation point to select the contractors.

Public Finance Initiative (PFI) and Public Private Partnership (PPP) have been gradually prevailing in developing countries. B/C evaluation system is suitable for these programs, however, most of Japanese ODA are utilized for conventional public investment projects with low initial cost.

It is also efficient to demonstrate difference of design structural feature between two methods

shown in Table No.3. The cost difference could be justified by use of this technical data comparison.

**Table No.3 “Comparison of Design Structural Feature between M Net and Drapery”**

		M Net	Drapery	difference	
	unit			times (drapery =	
Weight	kg per m2	8.3	3.8~4.3	2	incl. net, rope, anchors
Anchor	total length meter per m2	0.34	0.21		no. and length of each anchor is converted into liner meter
Pin Anchor	total length meter per m2	0.99	N.A.		ditto
Anchor + Pin Anchor	total length meter per m2	1.33	0.21	6	ditto

This table shows that weight of “M Net” is 3 times heavier than “Drapery” and anchor length of “M Net” is 6 times longer than “Drapery”.

These differences achieve the higher quality of “M Net” system in comparison with “Drapery” system despite of the higher initial cost.

**9.2. Issues to be solved for Japanese High Quality Infrastructure Export Initiative**

“M Net” system is widely adopted as rockfall countermeasure in Japan because of long service life. However, the authors have found several issues to be solved for developing countries to accept this system.

**9.2.1. Warranty period and condition**

Firstly, Project execution agencies sometimes request contractors to warrant the product in conformity with service life. Table No.2 shows that Net Present Value (NPV) of “M Net” system becomes lower than “Drapery” system after Year 14th. In this case, some Project execution agencies request 15 years or longer warranty period to the contractor although their government rule stipulates one or two year warranty period.

From the point of the Project execution agencies

view, it is reasonable to request the contractor to warrant the service life which causes higher cost.

On the contrary, the contractor shall not undertake unlimited risks against repair or replacement in case those damages occur for the warranty period. From the point of the contractor view, to define the scope of warranty is necessary for the contractor to calculate and limit the risks during the warranty period.

The authors made the sample of terms and conditions of the warranty for a contractor shown in Table No.4 “Warranty Conditions against defaults or damages”.

**Table No.4 “Warranty Conditions against defaults or damages”**

Warranty period	20 years
Warranty strength	Rockfall prevention or protection against kinematical rockfall energy less than the designated design calculation energy
Remedy works	Supply of rer
Total Liability Limit	Up to 100% of the contract price
Exemption clause	Breakage or damage caused by land slide Deterioration caused by undergroundwater flow Abrasion and/or rockfall caused by deterioration and/or weathering slope surface over time Breakage or damage caused by kinematical rockfall energy over the designated design calculation energy Rust appearance and progress over time Rust appearance and progress caused by acid soil Rust appearance and progress caused by acid rain Deterioration and/or damage caused by sulfur and/or sulfuric acid Damage caused by earthquake, flood, thunder Damage caused by high temperature such as field burning Breakage or damage caused by willful mischievousness or theft Deterioration and/or damage caused by unforeseen inclement weather or other natural disaster Breakage or damage caused by no conformity performance with method statement

Contractor's warranty scope shall be limited within premises stipulated in specifications of the contract and many exemptions shall be stipulated to avoid unforeseen risk for contractors. However, the rockfall occurs caused by several reasons, and it is difficult to predict when rockfall will occur in advance.

There is a gap in warranty between Project execution agencies and contractors. There are several schemes to be considered to cover this gap.

One is to set up insurance scheme such as a product liability insurance to mitigate the above gap between Project execution agencies and contractors.

Monitoring and maintenance service contract utilizing Public Private Partnership scheme is also one of the solutions to cover the above gap.

Risk of rockfall during warranty period shall be shared with contractors and Project execution agencies properly. And it is to be stipulated in the contract who shall take responsibilities for rockfall damages depending on the cause of rockfall.

### 9.2.2. Deferred Finance

Most of developing countries recognize merits of high quality infrastructure and try to allocate appropriate budget for high quality infrastructure as initial investment. However, due to limitation of government finances, those governments tend to choose lower initial investment infrastructure although they are not satisfied with its quality. Apart from ODA projects, finance arrangement i.e. deferred finance provided by Japanese public funds and co-financing of the private sectors in conformity with the warranty period is to be considered. Deferred finance with repayment term to meet the warranty period such as 20 years could be one of financial solutions for dissemination of high quality infrastructure into developing countries.

### 9.2.3. Payment settlement risk

There are many opportunities for Japanese SMEs to provide their products and services with local contractors in case of untied Yen loan ODA projects and local finance projects.

It often happens that financial conditions of local prime contractors are not disclosed and are vulnerable status. Therefore, Japanese SMEs are often exposed payment settlement risk.

Insurance to cover such payment settlement risk for Japanese SMEs is to be considered by Japanese government to protect and enhance overseas business activities for Japanese SMEs because many Japanese SMEs' financial conditions are also

vulnerable.

## 10. Conclusion

Several points and issues are pointed out for Japanese Small Medium Enterprises (SMEs) related construction industries to expand business to overseas market, especially focusing on Japanese ODA and Japanese government support programs in this paper.

It is understood that several Japanese supporting programs are useful and effective although some points are to be improved.

High quality of Japanese products and technologies are one of the key elements to achieve the above goal.

Meanwhile, SMEs position is not a prime contractor, but subcontracting or supplier's position. Therefore, customers of SMEs are changed from Japanese prime contractors to foreign or local prime contractors in accordance with financial resources such as tied (loan and grant) Japanese ODA, untied Japanese ODA, local government or other international donors.

Potential market size will expand accordingly, however, business risk will also increase.

It is expected that Japanese government will provide further supporting programs in order to mitigate business risk for SMEs to expand overseas business with foreign customers.

The author wishes to deliver further studies to support SMEs overseas business continuously.

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