Establishing Construction Contract Administration Education/Training Program for Developing Countries

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ABSTRACT: Major infrastructure development projects in developing countries have been financed from foreign assistance. International donors such as the Asian Development Bank, the World Bank and Japan Bank for International Cooperation have been adopting the conditions of contract prepared by the FIDIC for the construction projects in aid recipient countries. Such international construction projects requires the contracting parties to have contract administration functions in order to achieve the project objectives such as time, cost and quality in a transparent way and ensure the project compliance. However, contract administration is a very undeveloped area of project management in developing countries. On the other hand, Japanese public works use lump sum contract for construction, and bill of quantities and work program are not binding to the contracting parties. Contract administration in construction is not demanded. However, the occurrence of claim events are endemic in construction project and claim/dispute management system is not as transparent as seen in international construction project. A training program on contract administration for international construction project have been developed by Kochi University of Technology in association with Nippon Koei and in cooperation with Japan Bank for International Cooperation to strengthen contract administration in official development assistance project in developing countries and to make Japanese construction professionals familiar with international practice in construction contract administration. 5 trainings have been conducted so far in Japan, Thailand, Mongolia and Sri Lanka. The functions of contract administration, training outputs and its prospect in developing countries and in Japanese construction industry are discussed.

Key Words: contract administration, developing countries, FIDIC, construction project

1. INTRODUCTION

The developing countries' infrastructure needs are enormous. The Asia region will need about US\$ 3 trillion over the next ten years to cope with the growing demands for infrastructure services¹⁾. In order to fulfill the growing demands for infrastructure services many Asian developing countries have high priority in infrastructure development and these countries are striving in creating favorable environment to attract private as well as foreign investment. However, the local construction industry in many Asian countries is not well equipped with competent human resources and appropriate technology required for the infrastructure development. Delay and cost overrun are endemic in the construction industry in developing countries in Asia and Africa as well²⁾. For instance, one of

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the major issues that has attracted attention of policy makers, implementers, professionals and academia in Sri Lanka has been the significant delays during the implementation of donor assisted projects³⁾. Similarly, the quality and productivity in the construction sector are still in very dismal situation⁴⁾. As a result delays, poor quality and low productivity are major problems in infrastructure development project.

Moreover, it has been observed that contract administration is a very undeveloped area of project management in developing countries and many of the project managers/construction engineers in developing countries are not familiar with modern practice of project management including schedule control, cost control, quality control, productivity improvement, safety control, tendering requirement and contract administration. The education system in developing countries typically has not recognized the importance of contract administration and very few developing countries universities are equipped to give complete lecture course in contract administration. As a result, project participants are not able to execute the project in professional manner and complying with the donors' guidelines and requirement to be fulfilled by the borrower/executing agency (EA).

Similarly, public construction contracts in the Japanese domestic industry do not provide the contractors enough opportunities to learn rigorous contract administration including claim management and dispute resolution. As a consequence Japanese contractors can not gain enough experience from the Japanese domestic industry to enhance their competitiveness in areas like management, administration which are required to expand their overseas business such as in project management. Further, Nielsen, K.R. has also pointed out that "Japanese engineers need contract administration, dispute resolution and risk management skills in order to be competitive in the global construction market"5). In addition, Japan Bank for International Cooperation (JBIC), the organization responsible for lending loans from the Japanese government, has cautioned that if contract administration is not properly made, increase in cost, delay in implementation and degradation of quality of the works



Figure-1: ODA to aid recipient countries from DAC members⁶⁾ (negative disbursement was reported for Indonesia in 2004 and for Malaysia in 1996 and 1997)

Source: http://stats.oecd.org/wbos/Index.aspx?DatasetCode=ODA_RECIPIENT)

might occur. Effectiveness of the project will suffer⁷).

Some donor agencies are providing sporadic short training for executers, however there is no availability of appropriate training program in the construction industry in developing countries as well as in Japan specially required for construction professionals to enhance their knowledge and skills on construction contract administration. Such situation has made donor agencies to consider in developing some appropriate training programs, which would enhance the capacity of human resources involved in infrastructure development in order to improve the project execution efficiency and the project compliance as well. discusses the principles of contract This paper administration in construction and introduces a training program on 'contract administration for international construction project' developed under the assistance of the JBIC.

2. DONORS' COMPLIANCE REQUIREMENT IN CONSTRUCTION PROJECT EXECUTION IN AID RECIPIENT COUNTRIES

The official development assistance (ODA) since its adoption has become a major resource for the development of the developing countries. The demand for the ODA in many developing countries has not been decreased as seen from figure 1. Especially the low-income developing countries such as Nepal, Cambodia are particularly dependent to the foreign assistances from donor agencies for their infrastructure development.

Donors evaluate the performance of the project funded by them for the achievement and the compliance with their requirements. For instance, the Asian Development Bank (ADB) evaluates the project planning and implementation performance in terms of formulation and design, achievements of outputs, cost and scheduling, procurement and construction, organization and management⁸⁾. Similarly, the JBIC evaluates the project efficiency in terms of cost and schedule during implementation among others. The donor agencies reserve the right to suspend the loan/grants and/or terminate the contract with contractors/consultants if the contracting parties are found involved in corruption and

fraudulent practices in the project implementation. For example, the International Federation of Consulting Engineers (FIDIC) has prepared a harmonized edition of the conditions of contract for construction for building and engineering works designed by the Employer for the common use in the project funded by nine multilateral development Banks (multilateral development bank (MDB) is an institution created by a group of countries, that provides financing and professional advising for development): 1) African Development Bank 2) Asian Development Bank, 3) Black Sea Trade and Development Bank, 4) Caribbean Development Bank, 5) European Bank for Reconstruction and Development, 6) Inter-American Development Bank, 7) International Bank for Reconstruction and Development (The World Bank), 8) Islamic Bank for Development Bank, 9) Nordic Development Fund. The harmonized edition of FIDIC conditions of contract include the provisions such as: to allow the Bank to inspect the site and/or the account and records relating to the contractor's performance of the contract and to have such accounts and records audited by the auditors appointed by the Bank if required by the Bank; to the bank decide not to finance any proposal to award a contract, if the Bank found that any firm, entity or individual bidding or participating in a Bankfinanced project including inter alia, applicants, bidders, contractors, consulting firms, individual consultants, borrowers, purchasers, executing agencies and contracting agencies engaged in an act of fraud or corruption in connection with Bank-financed projects⁹⁾. Similarly, it has stipulated the provisions for managing changes including conflicts/claim/dispute management with clear allocation of risk and responsibility among the contracting parties. Thus each contracting party to the contract should know their roles, responsibility and the requirement demanded by the contract and by donors as well. The development process in an aid recipient country will suffer if the contracting parties in the implementation of the project are not familiar with the conditions of contract and do not fulfill the requirements set by the donors.

3. PRINCIPLES AND PRACTICE OF CONTRACT ADMINISTRATION

Contract administration is the process of handling daily contractual issues that arise and cope with them in accordance with the progress of the whole project. Thus, contract administration in construction basically deals with defining complete scope of work, identifying risk, responsibility and liability of each party to the contract, process and requirements to be followed in execution, payment, variation/change management, schedule, cost and quality control, and claim and dispute settlement. In effect, contract administration functions as the axle of the project management.

(1) Conflicts in Construction

The principle of contract means 'both parties have the equal rights and obligations'. When the rights and obligations are one-sidedly prejudiced, they must be compensated by the likely 'cost'. In case of a construction project, such prejudice is compensated by 'time and cost'. As long as construction projects are executed in the natural environment the construction contract contains room to cause differences in understanding the rights and obligations of the contracting parties when compared with those contracts for other manufacturing industries, and such differences in understanding comes out vividly as 'conflict/confrontation' among the contracting parties.

Although the Japanese Construction Business Law advises to make Japanese construction contract on the agreement on mutual equal position and carry out the contract in good-faith and sincerity, international contracts are prepared by considering the mutual mistrust at its core. There are many sources of mistrust in construction, for instance, Cheung, S.¹⁰⁾ identified that incompetence, failure of integrity and unworthy information are also the sources of mistrust in construction. Thus conflict/confrontations among the contracting parties are common in construction and cannot be avoided. The settlement of disputes should be earnestly sought¹¹⁾. Therefore, it is essential for all the parties to investigate the sources of mistrust and

conditions/events which lead to confrontation among the contracting parties and may give rise to a claim.

(2) Production Analysis and Differing Conditions

The quantitative analysis of a contract is to establish how time and cost stipulated for the contract have been changed as the project progresses incorporating the changes of the contract scope and conditions from the originally set values at the time of signing. The changes of productivity can be grasped by quantitative changing analysis of the work resources: labor, materials, equipment, etc. Analyzing the changes of the work resources from the both sides of cost control and schedule control, it becomes possible to know the consequences in advance due to the changes of contract conditions. Figure 2 shows the outline of the correlation control of the resources, productivity, cost and time with contract administration.

4. PRACTICE OF CONTRACT ADMINISTRATION IN INTERNATIONAL CONSTRUCTION PROJECT

The conditions of contract prepared by the FIDIC (International Federation of Consulting Engineers) have become standard conditions of contract for international construction projects. International donors such as the ADB and World Bank (WB), and JBIC had been using the FIDIC conditions of contract with some modification to make the contract conditions a bank specific, and FIDIC has prepared a MDB harmonized edition FIDIC in 2005.

FIDIC conditions of contract for construction has included the provisions for the services of the engineer in a three-party system (the employer - the contractor – the engineer) as the party responsible for administration of the contract, supervision of the work and determination over the issues aroused during the execution of the project. The engineer also acts as a decision maker if there is a dispute between the employer and the contractor.

FIDIC conditions of contract for construction clearly dictate the risk and liabilities of the contracting parties, procedures related to payments, variations, claim applications, dispute settlements, etc. It also stipulates the deadlines for notifying the other party, filing claims, giving



Figure 2: Schedule & Cost control integrated with contract administration; adapted from Kusayanagi, S. 2000

decisions, etc. that the employer, the contractor, the engineer and the dispute adjudication board (dispute board) have to follow.

(1) Claim Procedure

A contracting party, the employer or the contractor, is required to notify the other party of the occurrence of the claim events within the stipulated time, usually within 28 days of occurrence of the events, which give rise to claim. If the contractor intends to claim against the employer, the contractor is required to inform the engineer within 28 days of the occurrence of the claim event. However, if the contractor fails to notify the of the claim within 28 days of the occurrence of the event, the time for completion will not be extended, the contractor shall not be entitled to additional payment, and the employer shall be discharged from all liability in connection with the claim. The contractor is required to keep all the records required to substantiate the claim, and within 42 days after the contractor became aware (or within such other period as may be proposed by the contractor and approved by the engineer) of the event, the contractor is required to submit the detailed claim, which includes full supporting particulars of the basis of claim and of the extension of time and/or additional payment claimed.

The engineer examines and evaluates the claim and gives his/her decision within 42 days after receiving the claim. The contractor is required to include the amounts for any claim that has been due under the relevant provision of the contract in the monthly payment claim.

If either the employer or the contractor is not agreed with the engineer's decision, then the employer or the contractor may refer the claims to Dispute Adjudication Board (DAB). The DAB is comprised of either one or three qualified persons and is established usually within 28 days after commencement of the project. Both the parties are required to make available to the DAB all additional information, access to the site and appropriate facilities for the purpose of making decision on the dispute. The DAB is required to give its decision within 84th day after the reference of the case to DAB. However, the decision of the DAB shall not be binding to the contracting parties unless both parties accept.

If either party (employer or contractor) is dissatisfied with the DAB's decision, then either party, on or before 28th day after the day on which it received notice of such decision, may notify the other party and the of its dissatisfaction. The parties then attempt to settle the dispute amicably before the commencement of arbitration. Arbitration may be commenced on or after the 56th day after the day on which notice of dissatisfaction was given. The decision by the arbitration shall be final and binding to the both parties.

Thus the employer and the contractor have to establish appropriate contract administration system such as shown in figure 2 for ensuring that the contractual requirements have been met.

5. PRACTICE OF CONSTRUCTION MANAGEMENT AND CONTRACT ADMINISTRATION IN JAPAN

The designated bidding system is a common practice in Japan in which Japanese public works executing agencies nominate certain contractors to bid for a project and award the contract to the bidder who has offered the lowest bid. The lump sum contracts are used in the public works in which the bill of quantities and schedules of works (work program) are not the contractually binding documents to the employer and the contractor. The payment system in the Japanese public works consists of the advance payment of usually 40% of the contract price at the time of contract signing and the remaining 60% either after completion of the contract or on installment basis in contrast to the progress payment system as practiced in international construction market. In effect the Japanese conditions of contract for public construction works do not require the contracting party to show the process control in the project execution except for the final product.

The project is executed under two-party system (the employer - the contractor), where the employer deputes a project manager and supervises the contractor work himself. Unlike in the international construction market, the Japanese standard form of contract for public construction works does not include the provisions for the services of the independent engineer for the execution of the project. The consultant services are usually sought in preparing the design and estimate of a project.

(1) Contract conditions for change management and adjustment of construction period and contract price in Japanese public works

Variation in the Japanese public construction works is addressed under articles: Differing Site conditions (article 18) and Changes to Drawings and Specifications (article 19). These articles require the contractor to promptly inform the employer about the differing site conditions but do not stipulate any notification deadline as in FIDIC conditions of contract beyond which the contractor is not entitled to be compensated. The contract is not clear about the requirement for the contractor to submit the employer sufficient supporting documents to show the changes in the site condition has actually affected or will affect in the schedule and quantity of works, however it provides the provisions for the Project manager-the employer's employee to verify and survey to confirm the difference in the site conditions. Similarly, when the employer changes the original drawings and specifications it is dealt under Changes to drawing and specifications. In both the cases if the employer confirms the changes, the articles say that 'the employer shall adjust the Construction period or the Contract price, if necessary, and shall bear damages incurred by the contractor, if any.'

Once the contractor notify the project manager of the changes and situations, which were beyond the contractor's control and do not fall under the contractor's liability that caused contractor to spend more time and money, the contractor may claim specifying the reasons in writing for extension of the construction period if the contractor is unable to complete the works within the stipulated construction period. The employer's project manager confirms the situations and consultation between the employer and contractor starts. If the agreement on the adjustment of contract price and/or construction period could not be reached from the consultation, the Japanese contract gives the authority to the employer to decide over the adjustment and to notify the same to the contractor. The contractor may request for mediation if the decision by the employer was not acceptable to the contractor. The mediation is done by member(s) of Construction Dispute Resolution Committee (Central/Prefectural). If the contractor still does not agree with the decision of the mediation the final and binding arbitration process will be started^{12, 13)}.

Such practice of change management and claim/dispute settlement in Japanese public works is very unique compared to the international practices where the engineer is employed to determine and give decision over any contractual issues in connection to the project execution.

(2) Survey Results

Α questionnaire survey regarding the Japanese conditions of contract for the public construction work including claim/dispute management system was conducted. Α written questionnaire was sent to 25 individuals/organizations who had been involved in construction. Only 10 filled questionnaires were received. The respondents were asked about the occurrence of activities, which could be a base for filing a claim in international construction, and filing a claim in Japanese constructions. The respondents' responses on occurrence of activities/circumstances such as design change, differing site conditions, change in specifications, etc. and their experience in filing claims are shown in figures 3 and 4 respectively. There was no correspondence between reported occurrence and the filing of claims. The figure 4 shows that not all the activities such as changes in design, site conditions, specifications, scope, etc occurred in the construction project execution would always be the claim events in Japanese construction industry. For instance, the majority of the respondents rarely filed claim against employer interference, delay in decision by engineer, delay in issuing drawings, etc. even they reported such activities often occurred in project execution. The instances of filing claims in general according to the respondents were less compared to the occurrence of events.

6. INTRODUCTION TO 'CONTRACT ADMINISTRATION FOR INTERNATIONAL CONSTRUCTION PROJECTS' TRAINING PROGRAM

International construction contracts using FIDIC Redbook provides the contractor opportunity to file claims if there is a change in the contract conditions, and similarly, the employer can file claim against the contractor if the







Figure 4: Claim events/circumstances in Japanese construction projects

contractor did not meet the contractual obligations. To be compensated in the international construction the claimant is required to be an initiator as opposed to be a follower in Japanese public construction. There are deadlines for notifying the other party of the changes or intention of claims, submitting details or disagreement over any decision failing which the party will loose its right for compensation. Thus, the parties to an international contract are required to establish efficient administration system to fulfill all the contractual obligations and to be compensated for rightful due.

Realizing these contrasting characteristics of the Japanese construction industry and international construction the Kochi University of Technology in association with Nippon Koei and in cooperation with the JBIC in 2006 have developed a training program - Contract Administration for International Construction Projects in order to make Japanese engineers aware of the international construction contracts and practice, and to provide opportunity to acquire knowledge and skills required to handle international construction project successfully. The key areas required to be mastered for efficient contract administration in construction projects were investigated personal experience, through donors' requirement, prevailing international practices, interviews, etc. The following courses were included in the training program and the training materials were prepared in Japanese first. Each lecture had been designed to conduct for 90 minutes, however time for case study was different depending on the cases.

- 1. Overview of International construction projects:
- 2. Project management for international construction project
- 3. Basis of international construction contract
- 4. FIDIC conditions of contract Red Book 1987
- FIDIC conditions of contract Red Book 1999 and MDB Harmonized edition
- 6. Time management using MS project
- 7. Preparation works for tender and contract
- 8. Practice and theory of Schedule control
- 9. Practice and theory of cost control
- 10. Procurement management

- 11. Claim applications
- 12. Claim evaluations
- 13. Settlement of disputes
- 14. Practice of negotiation of claim/dispute management (case study)

The first training program for Japanese engineers was organized on 10-13 August 2006 in Tokyo. 30 construction professionals participated in the training. Kochi University of Technology and the JBIC after conducting the first training had realized that project compliance and efficiency in official development assistance (ODA) construction projects could be improved provided the contract administration training available for project managers/senior construction professionals from aid recipient countries. The training materials were then prepared in English and a training on 'contract administration for international construction project in Asia' was organized in Bangkok in cooperation with JBIC and Asian Institute of Technology (AIT), Bangkok on Feb 26 - 2 March 2007. 23 participants from Bangladesh (2), Cambodia (2), India (2), Indonesia (2), Laos (2), Malaysia (1), Maldives (1), Pakistan (1), Philippines (2), Sri Lanka (1), Thailand (4) and Viet Nam (3). The participants were from government organizations and universities who were involved in project execution in their respective countries. Since the return of the participants in their own country, many developing countries requested KUT and JBIC to provide a similar training for senior construction professionals in a regular interval. Then JBIC and KUT agreed to conduct similar training in cooperation with the JICA (Japan International Cooperation Agency) once a year in Japan for senior construction professionals from developing countries. The first training in cooperation with the JICA was organized in Tokyo on Aug 26 - Sep 6 2007. 15 participants from 13 different countries including Bangladesh, Bhutan, Cambodia, India, Laos, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand and Viet Nam attended the training.

Since the completion of the training in Bangkok and in Tokyo many developing countries requested KUT and JBIC to organize similar training locally in order to make the training accessible to many construction professionals from a country. The authors in cooperation with Mongolian University of Science and Technology, Ulaanbaatar conducted a similar training on contract administration for construction project on 12-14 January 2008 in Ulaanbaatar. 38 participants including government engineers /Administrators/Project Managers, Consulting engineers, Construction Managers, Researchers and university Faculties had attended the training. Similarly, University of Moratuwa (UOM) Sri Lanka, the JICA, JBIC and KUT organized a seminar on contract administration on international construction projects in Colombo on Feb 29, March 1, 7 and 8, 2008. 37 participants attended the seminar.

(1) Evaluation of the training and future prospect

In order to evaluate the training conducted so far the Kirkpatric training evaluation model¹⁴⁾ was adopted. The Kirkpatric model includes the measure of four levels, namely i) reactions - participants' reaction, ii) learning changes in participants knowledge and/or skills, iii) behavior - changes in participants' behavior in the workplace, and iv) results - final results obtained in participants' workplace. However, due to the limitation of resources the first two levels (reactions and learning) were only measured in this study through questionnaire survey. The first training in Tokyo, Bangkok, Mongolia and Sri Lanka were considered for evaluation. Among the 30 participants of the first training in Tokyo 3 were from universities, 6 were from contractors, 9 were from consultants, 5 were from professional associations and 7 were from the JBIC. Among 30, 12 were engineers, 9 were administrators and 9 participants did not provide their background. professional Regarding the overseas construction experience of those 30, people with less than 1 year of experience were 2, with 1-5 years of experience were also 2 and with 5-10 years of experience were 3.1 people had more than 20 years of experience and 8 people without any overseas construction experience were also in among those 30. However, 14 people did not provide the information on their overseas construction experience.

Similarly, among the 23 participants of the training in Thailand 3 were from universities, 17 from project employer's organizations, 1 from donor's organization and 2 from private companies. Among those 23, 17 were engineers and 4 were administrators. But 2 people did not mention their occupation. Regarding the construction experience of those 23, it was reported that people with 1-5 years of experience were 2, with 5-10 years of experience were 4, with 10-20 years of experience were 2 and with more than 20 years of experience were 8. However, 3 participants did not have construction experience and 4 people did not report their experience in construction.

Likewise, 30 people were from public organizations and 8 were from private companies in among those 38 Mongolian participants in Mongolia. Among the participants 15 were administrators and 23 were engineers. The experience of the participants was not reported.

Among the 37 participants in Sri Lanka, 1 was from university, 20 were from public employers, 1 was from private employer, 1 was from consultants, 8 were from contractors and 6 were from manufacturing companies. Regarding the construction experience of those 37, it was reported that 5 people had 1-5 years, 10 people had 5-10 years, 13 people had 10-20 years, and 7 people had more than 20yeras of construction experience. However, 2 people did not report their experience in construction.

The participants' reactions and learning were assessed through the following 4 questions. The participants were asked to answer in a scale of 1 to 5 where, 1 stands for less than 30%, 2 for 31 - 55%, 3 for 56 - 70%, 4 for 71 - 85% and 5 for 86 - 100% on the four questions shown below.

The responses from the participants on four trainings are shown in tabular form in table 1.

All the 13 lectures were not delivered in the four trainings considered for evaluation due to time and resources constraint, and responses on the lectures delivered were collected accordingly. For instance, the lecture on time management using MS Project was not delivered in Mongolia and Sri Lanka due to lack of availability of computers.

a) Question 1: Easiness of understanding of the lectures

Regarding the easiness of the understanding the lectures no participants rated below 4 indicating that the participants were able to understand at least 85% of the contents. The average ratings of the Japanese participants on FIDIC conditions of contract and settlements of disputes were lower compared to the average ratings of the participants in Thailand, Mongolia and Sri Lanka. This comparative lower rating, though not significant, might be due to the lack of opportunity to use FIDIC conditions of contract in Japanese construction industry and Japanese grant aid projects, and differences in dispute settlement provisions from the international practices. Japanese participants did not have opportunity to perform contract administration job so they might have difficulty compared to other participants in understanding of such lectures. However, FIDIC conditions of contract are widely used in ODA construction projects in developing countries and consequently participants from such countries could have opportunity to use FIDIC contracts and international dispute management system in their countries. It indicates that Japanese engineers needs to improve their understanding on international contract conditions and dispute settlement practice in order to be competitive in international construction market.

—	Q1: Easiness to				Q2: Usefulness of				Q3: Enhancement				Q4: Sufficiency of			
Topics	understand				course				of knowledge				the contents			
	TK	TH	MG	SL	TK	TH	MG	<u>SL</u>	TK	TH	MG	SL	TK	TH	MG	SL
1. International construction project	4.5	4.3		4.2	3.9	4.5		4.2	3.6	4.3		4.0	3.9	4.2		3.9
2. Project management for international construction project	4.3	4.2	4.1	4.2	4.2	4.4	4.7	4.2	4.0	4.2	4.4	4.1	4.0	4.0	4.6	3.9
3. Basic of International construction contract	4.5	4.8	4.2	4.4	4.4	4.8	4.7	4.5	4.0	4.7	4.5	4.2	4.3	4.5	4.1	4.2
4. FIDIC conditions of contract Red Book 1987	4.1	4.5	4.3	4.1	4.3	4.5	4.6	4.3	4.0	4.4	4.5	4.1	3.9	4.1	4.7	4.0
5. FIDIC conditions of contract Red Book 1999 and MDB Harmonised edition	4.0	4.7	4.3	4.1	4.2	4.7	4.7	4.4	3.9	4.6	4.5	4.3	3.9	4.5	4.6	3.8
6. Project time management using MS Project	4.7	4.8			4.9	4.8			4.6	4.8		4.6	4.6	4.5		4.4
7. Procurement management	4.3	4.3	4.5	4.5	4.7	4.5	4.7	4.3	4.2	4.3	4.6	4.3	4.3	4.2	4.6	4.3
8. Preparation works for tender and contract	4.7	4.7	4.5		4.8	4.8	4.7		4.5	4.6	4.6		4.5	4.5	4.6	
9. Practice and theory of schedule control	4.5	4.6	4.5	4.7	4.6	4.8	4.7	4.7	4.3	4.6	4.6	4.6	4.5	4.6	4.6	4.4
10. Practice and theory of cost control	4.4	4.5	4.5	4.1	4.5	4.8	4.7	4.5	4.1	4.6	4.6	4.2	4.4	4.4	4.8	4.0
11. Claims applications	4.3	4.4	4.5	4.2	4.5	4.8	4.7	4.4	4.1	4.7	4.6	4.2	4.1	4.3	4.6	4.1
12. Claim evaluations	4.2	4.3	4.5	4.2	4.5	4.8	4.7	4.4	4.1	4.7	4.6	4.2	4.2	4.4	4.6	4.0
13. Settlement of disputes	4.0	4.6	4.6	4.2	4.4	4.9	4.7	4.3	4.0	4.8	4.6	4.1	4.0	4.7	4.6	4.1

Table 1 Evaluation of Training- Participants' rating on the question 1 to 4

Note: TK: Tokyo; TH: Thailand; MG: Mongolia and SL: Sri Lanka

b) Question 2: Usefulness of the courses

Similarly, Japanese participants rated the lowest score, 3.9 on usefulness of lecture on international construction project however participants from other countries rated no less than 4.2 on all the lectures. Japanese participants might realized that characteristics of international have construction projects are not compatible with Japanese construction projects and the international project execution system would not be adapted in the Japanese construction industry. These factors might have affected for lower rating than other countries participants. However, the Japanese participants realized the usefulness of the project time management using MS Project higher than the participants in Thailand training did. Since MS Project is widely used in other countries than in Japan, Japanese participants after the training could have realized the applicability and efficiency of the MS Project better than the participants from other countries indicating higher prospect of using MS Project in establishing project time management function in Japanese construction industry.

c) Question 3: Enhancement of knowledge

Regarding the enhancement of the participants' capacity from the training participants from other countries rated higher on all the lectures than Japanese did. Participants from other developing countries had experience of working in international construction project and they will have opportunity to involve in international construction project in future also, so the topics discussed in the training might have addressed problems, which they had encountered before and they found some areas in which they can do better in future. These backgrounds might have affected the score. However, there is no opportunity for Japanese participants to involve in international construction project in Japan and they will not have opportunity to be involved until they go outside Japan. Such factor had influenced the rating of Japanese participants on the enhancement of their capacity.

d) Question 4: Sufficiency of contents of the lectures

Similarly, participants from Sri Lanka rated the lower score 3.8 than that by Japanese participants 3.9 on sufficiency of the contents to explain the topics- FIDIC conditions of contract Red Book 1999 and MDB Harmonized edition. It indicates that participants from Sri Lanka wanted more elaboration in explaining the contents of FIDIC. However, other participants rated no less than 4. Thus the trainings were able to fulfill more than 80% of the expectation of the participants in their learning on the topics included in the training.

(2) Constraints in Promoting Contract Administration Education/Training

The major constraints found for conducting such training locally in developing countries were the lack of appropriate resource persons and computer facilities required for the training. Thus it is necessary in the first place to train a group of people who have adequate construction experience and qualification, and establish physical facilities in several developing countries so that the resource persons thus trained would be able to train locally and help reduce the dependency to foreign resources.

In order to make the contract administration education and training available in developing countries the training materials developed until now needs modifications to make it suitable for different level of potential users such as graduate students, junior engineers, senior engineers/ project managers. Also, some text books and references should be developed to make the contract administration education available in university. Establishing center of excellence in construction and project management at universities of developing countries as proposed by the authors¹⁵⁾ through cooperation from donor agencies and university from developed country would help create a pool. of resource persons and resources in developing countries. International society for construction management and network among professional societies such as society of civil engineers from developing countries and developed countries should be established in order to exchange the resources accumulated in a society/country to other societies/countries.

7. CONCLUSIONS AND RECOMMENDATIONS

Contract administration has become an important project administration function in construction project for ensuring transparent execution and decision making process. In order to achieve the project objectives and to ensure the project compliance set by the donors and project employers the contracting parties to an international construction project such as ODA construction projects in developing countries are required to establish contract administration function in the project management. Such project implementation environment has created a growing demand for such training in the construction industry of developing countries such as Mongolia, Sri Lanka, and Cambodia

The occurrence of claim events in Japanese construction industry is endemic and the claim/dispute management system is not as transparent as in international construction. Establishing contract administration function in Japanese construction project execution would help integrate the time and cost management to a single management function. By doing so, the effect of a change to a management function in other management functions would be grasped quantitatively and can be managed accordingly, and thus transparency can also be ensured. Thus, similar to the international construction industry the Japanese construction industry can also maintain the transparency in project execution especially in decision making in variations and claim/dispute management in construction projects. However, the conditions of contract should be revised to incorporate the contract administration function in project execution, and the contract administration education/training is required to establish in university and in industry training centers in order to make Japanese construction professionals aware of international construction management and help them to acquire necessary skills required for contract administration.

The training on contract administration for international construction projects so far has become successful in providing construction professionals opportunity to acquire hands on knowledge and skills on contract administration required for efficient execution of international construction project. There is a great prospect of expansion of the contract administration education and training program and adoption of contract administration function in construction projects in developing countries. In addition, introducing contract administration function in construction project would help improve the transparency in Japanese construction industry too.

Lack of appropriate resource persons and text books for the training in developing countries is a major constraint in establishing the contract administration education/training in developing countries.

Similarly, the training should be continued in order to create pool of trainers in developing countries, and the behaviors and results in the participants' workplace should be measured to get feedback for improving the effectiveness of the training. In the mean time some textbooks and references should be prepared in order to establish university based education program on contract administration in construction projects. Cooperation among donor agencies, aid recipient countries and universities should be established to promote contract administration education/training in developing countries.

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