CRITICAL ISSUES IN CONSTRUCTION JOINT VENTURES IN SRI LANKA

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(2014/2015)

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Sri Lanka

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Thesis submitted in partial fulfillment of the requirement for the degree

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DECLARATION

I declare that this is my own work and this thesis does not incorporate without acknowledgement any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

Joint venture (JV) has become a common business form for construction contractors in undertaking large construction projects worldwide. However, most of studies found that construction joint ventures (CJVs) can be failed due to several issues such as, unclear partner roles, unequal risk sharing, misunderstanding of practices etc. Hence, a necessity was emerged to conduct this research with the purpose of determining the issues which are critical for construction joint ventures in Sri Lanka in order to propose probable attributes to overcome.

Accordingly, thirty six issues in CJVs were determined though literature review and preliminary survey. The identified factors were evaluated by conducting a questionnaire survey with respect to the quantitative approach. Thus, the survey was conducted among the forty professionals who are engaged in CJVs in Sri Lanka and having a detailed knowledge and more than five (05) years of experience in the relevant field. The data collected through survey was analysed by using Mean Weighted Rating, Relative Importance Index and Box plot techniques to identify the issues which are critical in CJVs in Sri Lanka.

As the results denoted, twenty five critical issues were determined. Among them, not having formal guideline for partner selection and entering to JVs based only on qualification/resources issues were obtained highest rankings. Facing unavoidable events, leakage of information to outside parties and failures with respect to their political, social, legal and government procedures and no proper way to deal with additional installments were identified as least critical issues. Further verifications obtained through the visualization of box plots showed that not having formal guideline for partner selection has obtained the top ranking issue in CJVs in Sri Lanka with a high level of agreement among the survey respondents. Finally, the probable strategies were proposed to overcome the critical issues in CJVs in Sri Lanka. As the main implication of this research, the evaluation of issues of CJVs and the proposed strategies can be used by industry practitioners as a basis to evaluate the current status of CJV projects in order to initiate the successful CJVs in Sri Lanka.

Key Words: *Local Joint Ventures, Critical Issues, Construction Industry, Sri Lanka*

DEDICATION

I dedicate this piece of research to

MY BELOVED FAMILY…

Who encouraged me

Providing emotional and spiritual effort

In this endeavour….

ACKNOWLEDGEMENT

This research study would not be possible without the assistance and dedication of numerous individuals and organisations. Therefore, I take this opportunity to convey my gratitude to all of them who contributed in plentiful ways to complete this study.

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Without the active support I obtained from the participants of the data collection process, this research would not be successful. Therefore, I wish to express my greatest appreciation to all the practitioners in the industry who contributed to this study.

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LIST OF ABBREVIATIONS

CJV – Construction Joint Venture

IQR – Inter Quartile Range

JV – Joint Venture

MWR – Mean Weighted Rating

RII – Relative Importance Index

1.0 INTRODUCTION

1.1 Background

The construction industry, among the other industries, inflicts a number of challenges to those who are working in it (Wedikkara & Devapriya, 2000). Globally, construction businesses are becoming more aggressive due to complication of clients requirements and technology innovations. Thus, construction organizations are forced to form alliances at varying levels in order to stay in business especially when large and complex projects are involved (Minja, Kikwasi & Thwala, 2012). Joint venture (JV) has become a common business form for construction contractors in such large construction projects worldwide. In the construction industry, JV has become a common form of business, which is generally adopted by the contractors of large construction projects worldwide because it can enhance their competitiveness by pooling construction resources. According to a study by Cheatham (2004), the joint ventures have gained increased popularity among the contractors worldwide due to inbuilt features as sharing and mitigating construction risks.

A JV can be defined as "an enterprise, co-operation or partnership, formed by two or more companies, individuals, or organizations, at least one of whom is an operating entity that wishes to broaden its activities for the purpose of conducting a new, profit motivated business of permanent duration. In general the ownership is shared by the participants with more or less equal equity distribution and without absolute dominance by one party" (Kale, Patil, Hiravennavar & Kamane, 2013). Beside, JV can be referred to a form of business undertaking by two or more persons engaged in a single defined project (Garner, 2004). Further, JVs facilitate the combination of economic resources, skills and knowledge required for projects (Kwok, Danny & Martin, 2000). As Kwok, Danny and Martin (2000) further stated, the use of the JV set-up in the construction industry has become necessary in order to secure a large scale project or one that is beyond an individual firm's capability (Kwok, Danny & Martin, 2000). Studies by Dalle and Potts (1999) and Adnan and Morledge (2003) affirmed that the increased range of expertise, ability of risks sharing, ability of liabilities sharing, increased performance on site, gained entry to overseas market, improved coordination and pooling of resources as advantages of JVs. Further to authors, JV formation between construction companies is one of the recent efforts in

combating contractors' problems in construction industry in many countries specially when facing the challenge of undertaking large construction projects. Nevertheless, Johannes and Walker (2003) and Gomas (2001) studied a number of motivations for forming construction joint ventures in large-scale construction projects apart from the more obvious one of providing sufficient financial strength to participate in very capital-hungry infrastructures projects.

However, in practice, JVs are not the easiest forms of organizational entities to manage and operate, largely on account of the fact that the parties have to accept frequently a new set of working relationships to share knowledge, resources, technology and risk (Kale et al., 2013). Since JVs are allowing firms to share information, resources, markets and risks to build trust among firms, to yield economies scale managers often stress the cost of JVs, such as the potential for disagreements between partners, for diffusion of proprietary information, and for creation of future competitors (Catherine et al., 2001 and Gomas, 2001). Moreover, Anderson and Jap (2005) stated that a number of studies offer the failure rate of JVs at anywhere from 30% to 50%. As Anderson and Jap (2005) identified, the misunderstanding on each other's capabilities, knowledge, expertise, qualifications could lead parties' towards short-term unstable relationship. Further, the relationships marked by conflict, strife, competition and ongoing disagreements are clearly prone to break up the JV contracts. Moreover, Ozorhon, Arditi, Dikmen and Birgonul (2008) elucidated that the differences in organizational culture could differentiate the JV partners based on management practices of their respective organizations which may end result in conflicting behaviors due to misunderstandings and interaction issues. Additionally, disappearing markets, lagging technology, partners' incapability to work as per the contract, cultural differences of each organization could also lead to failure of JVs (Kuo-Cheng, Wensley & Kao, 2008). Similarly in Sri Lankan construction industry, there is a tendency to form JVs by construction contractors as a solution for lack of qualifications, resources and technology to undertake large and complex construction projects, especially when undertaking large infrastructure projects (Wickramasinghe, 2016). In local JVs, the respective contractors are investing heavily only on qualifications, machinery, equipment and/or manpower resources to undertaking the

project is a major issue where there is a difficulty to find a relevant contractor who invests money rather than the other resources. Further, JV agreements are institutionally developed in practice by identifying their own requirements on allocation of resources, bid and performance bonding, completion of work, contribution of both parties, profit, loss and other responsibilities, etc., as there is no any national guideline to follow. Hence, no any regulatory bound for the formation of JVs in construction industry has led to various issues between both parties in executing the large construction projects in Sri Lanka.

1.2 Research Problem Statement and Rationale

Executing the complex and large construction projects has been arisen as a key challenge faced by most of local construction organizations due to lack of expertise, qualifications, technology, financial and other resources. Thus, the formation of joint ventures has now emerging in practice by sharing knowledge, resources and technology required to undertake the complex projects. In the JV, two contractors are come into an agreement regarding the completion of the project. Most of studies found that CJVs can be failed due to many reasons such as, unclear partner roles, unequal risk sharing, misunderstanding of practices etc. Besides, most of previous studies have focused on individual factors, risk sharing, technology transfer etc. The failure of JV has been suffered mainly due to lack of regulations, no proper national legislative system; such as, policy, guideline etc. Further, no evidences were found on legislative background of JVs in Sri Lankan construction industry where many studies have found only on different procurement systems, trends and sub-contracting. These circumstances create a necessity to conduct this research with the purpose of determining the issues which are critical for construction joint ventures in Sri Lanka in order to propose probable attributes to overcome.

Accordingly, the research question is developed as, "What are the issues which are critical in construction joint ventures in Sri Lanka?"

1.3 Research Aim and Objectives

The aim of this research is to find the issues which are critical in construction joint ventures in Sri Lanka.

In order to achieve the aim, following objectives are formulated.

1. To review the concept of 'Joint Ventures' in construction
2. To identify contractual procedures which are applied nationally and internationally in construction joint ventures
3. To identify the issues of construction joint ventures
4. To determine the issues which are critical in construction joint ventures in Sri Lanka
5. To propose probable strategies to overcome the critical issues in construction joint ventures in Sri Lanka

1.4 Research Design

1.4.1 Literature review

A comprehensive literature survey was carried out through books, journals, articles, publications and government reports to identify the formation and operation of joint ventures, types of joint ventures, and the issues of construction joint ventures.

1.4.2 Questionnaire survey

Questionnaire survey was conducted among the professionals of CJVs in Sri Lanka to evaluate and determine the contractual issues which are critical in construction joint ventures in Sri Lanka.

1.4.3 Expert interviews

Five (05) expert interviews were conducted among the selected construction professionals who have engaged in CJVs in Sri Lanka to identify the probable attributes to overcome the critical issues in construction joint ventures in Sri Lanka.

1.6 Scope and Limitations

The scope of this research was to determine the issues which are critical in construction joint ventures in Sri Lanka. Further, among the different classification of joint ventures, CJVs were considered in this study. By considering the different form of construction joint ventures, local joint ventures practiced in construction industry in Sri Lanka were selected to conduct the study. Hence, the research was limited to local CJVs operated in construction organisations in Sri Lanka.

1.7 Thesis Structure

The thesis is structured mainly into five chapters such as, introduction, literature review, research methodology, data analysis and findings and conclusions as illustrated in Figure 1.1. Chapter one is to present the background for the research where it also includes the research problem statement, aim and objectives formulated. Further, a brief introduction to research methodology and scope and limitations are also included. The theoretical status of the research issues which was reviewed in key literature is included in chapter two while research methodology is presented in chapter three. Chapter four is structured to present the data analysis and key findings of the research. Finally, the conclusions and recommendations of the study based on the empirical findings gathered through questionnaire survey are presented in chapter five.

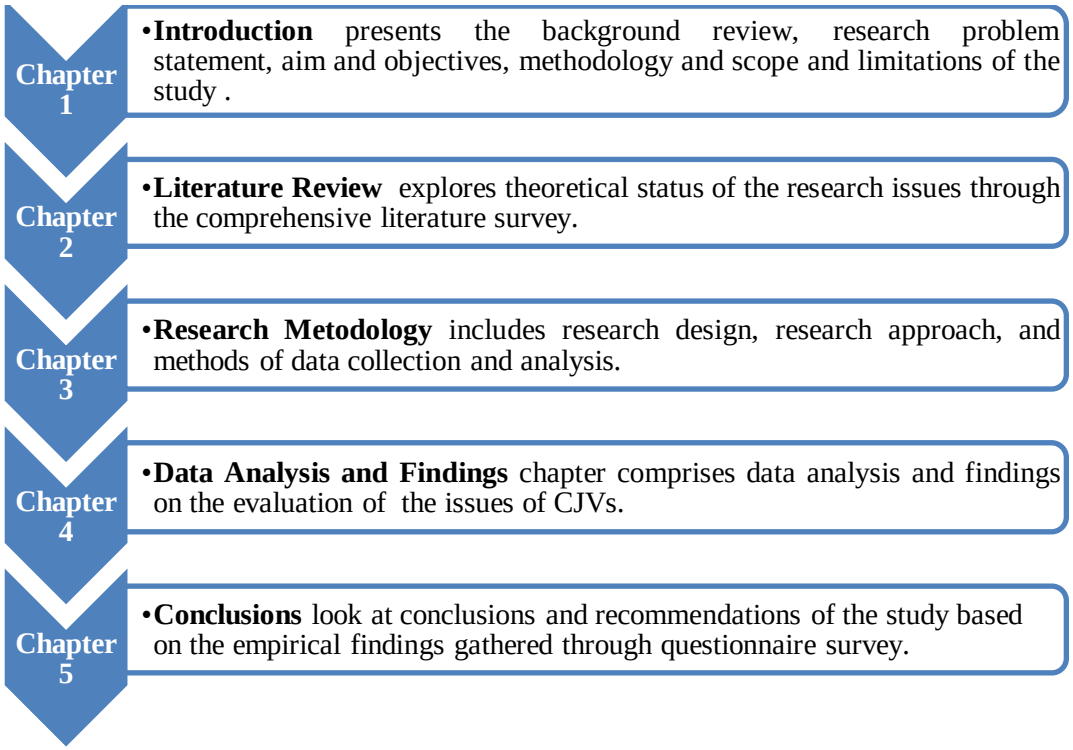

Figure 1.1: Thesis Structure

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter intends to synthesize the research area of construction joint ventures, its applicability and the issues for further refining of the research problem. The review of key literature is pertaining mainly to three major sections, such as, definitions to construction joint ventures, its formation, operation and issues in practice. The various definitions are reviewed along with the forms of joint ventures, and its applications in construction industry. As the most important of the research, the issues of construction joint ventures were identified in Section 2.5.

2.2 Construction Joint Ventures

2.2.1 Definitions of construction joint ventures (CJVs)

Construction businesses are becoming more competitive due to its complexity in nature (Allen, 2010). Specially, construction organisations have been forced by complex client's requirements and technology advancements towards forming alliances at various levels to stay in business, thus, they are necessitating the formation of joint ventures (Dalle & Ports, 1999; Wolf, 2000, Miller, 2002). Further, organisations in construction sector move more towards such joint entities to reduce the risk by sharing or transferring, exploring the wide markets and taking competitive advantage by forming joint ventures (Ozorhon et al., 2007).

There are many definitions of joint ventures describing its elements, purposes and features. The definitions given by Norwood and Mansfield are considered as most representative definitions (Barber, 2016). As stated in a study by Barber (2016), Lynch defined a joint venture (JV) as "a cooperative business activity formed by two or more separate organizations that creates an independent business entity and allocates ownership, operational responsibilities, and financial risks and rewards to each member, while preserving their separate identity/autonomy" (Lynch, 1989 as cited in Baber 2016, p.802). Walker and Johannes (2003) define the JV as collaboration between different organisations enables them to compensate for gaps in their knowledge and capacity to provide goods or services. A number of authors (Gaeton & Keith 1999; Wolf, 2000; Miller, 2002) have defined JV broadly, basically as a partnership or alliance between two or more companies which can be short or

long term to carry out an activity. Among those, JV is defined by Norwood and Mansfield (1999, p.89) as "the commercial agreement between two or more companies in order to allow greater ease of work and cooperation towards achieving a common aim, through the manipulation of the appropriate resources". However, the generally accepted meaning of JV has been declared by Walmsley (1981 as cited in Kwok, Then and Skitmore, 2000) as,

> Of limited duration formed by two or more independent business or professional entities for the purpose of furnishing engineering, consulting, procurement, construction and construction management services by consolidating kills and resources of participants (pp.3)

A Construction Joint Venture (CJV) refers to the collaboration of at least two construction organisations with a view to accomplish mutually-agreed-upon objectives, wherein they share project risks, knowledge and resources (Famakin et al., 2012). Thus, CJV defined in this research as a collaboration of two or more construction organizations to allow greater ease of work towards achieving a common aim through the manipulation of appropriate resources. JV formation between constructions companies has become one of the most commonly adopted methods in both developed and developing countries. It is because, the growing scale and complexity of construction projects, as well as technological advancements, organizations have begun to set up CJVs to utilize partner resources (Zhao et al., 2012).

2.2.2 Construction joint ventures and sub-contracting

Joint ventures and subcontracting are two main corporations mean in construction industry. However, each corporation has some unique characteristics compared to each other. According to a study by Taymaz and Kilicaslan (2002), sub-contracting is a forming of contractual relationship between firms or contractor and consultant where it is managed or monitored by laws which are related to the contract. As Zhang (2007) stated, in subcontracting relation, "the main contractor does not manage the details of the behaviors or actions of the subcontractors. The main contractor does not monitor the process of the subcontractor's construction. The main contractor just needs to monitor the results of the subcontractor's construction".

As Zhang further described, joint venture organizations can be viewed as hierarchical structures. The partners in the joint ventures monitor or manage their relations by hierarchical orders; even they also have agreement between the partners. The agreement between the partners only defines the structure of the joint venture, not details about management. Further, CJV is a different concept from subcontracting in construction industry in terms of its responsibility, risk control and management. As per the study by Zhang (2007), CJVs and subcontracting are very different with each other, from the motivations to the structures. The major differences can be identified as shown in Table 2.1.

Table 2.1: Difference between joint ventures and sub-contracting

Content	Sub-contracting	Joint ventures
Responsibility	▪ General contractor undertakes all the responsibilities for the client, while the subcontractor undertakes responsibilities for the general contractor	▪ The partners undertake the responsibilities to the client jointly
Risk	▪ Transfer the risk to the subcontractor	▪ Share between the partners
Control	▪ Control change from process to ▪ the result	▪ Share control on the process
Conflict resolve	▪ Contract law and court	▪ Hierarchy organization
Monitor	▪ By contract	▪ Order or authority

Source: (Zhang, 2007, pp.28)

In a narrow sense, construction joint venture can be defined as a combination of two or more business entities in construction industry that are collaborating together under a contractual agreement to share resources, project risks, knowledge and technology with a view to achieving a common aim, i.e. undertaking large construction projects etc.

2.2.3 Formation of construction joint ventures

Forming JVs is always used as an important means of cooperating contractors in construction industry. There are several reasons that could motivate the formation of joint ventures. According to a study by Modic (1988), the motives of the creation of joint ventures can be identified related to three (03) major categories such as internal reasons, factors influencing structural evolution of the industry and factors relating

to strategic objectives. As Modic (1988) further mentioned, reduce costs and risks, ensure production factors that cannot be acquired through purchase, improving access to financial sources, benefits from economies of scale and size advantages, access to new technologies and customers, access to innovative management practices, encourage business employees and competitive reasons are the internal reasons to form a joint venture (pp. 46-52). Further, there are three main factors influencing structural evolution of the industry such as pre-empting competitors, defense response to industrial blurred borders and globalization and creating loudest competitive units. Create and exploit synergies, transfer of technology and skills and diversification can be identified as strategic objectives of forming a construction joint venture. Other than that, as many researchers have reviewed in recent literature, gaining complimentary skills or pool resources, obtaining pricing security, meeting prequalification requirements, risk sharing, accessing technology are some of major reasons of forming a construction joint venture (Ma & Woo, 2014; Zhang, 2007; Hawkins, 2010; Adnan, 2008; Cheatham, 2004). According to a study by Kale et al (2013), joint ventures are forming as a competitive strategy, as well as a way to transfer technology, political risks, commercial risks and a remedy for tax implications. Further to authors, "joint ventures combine two contractors to generate bonding capacity that each contractor would not have individually" (pp.62). As described above, the common motives of forming a joint venture in construction industry are illustrated in Figure 2.1.

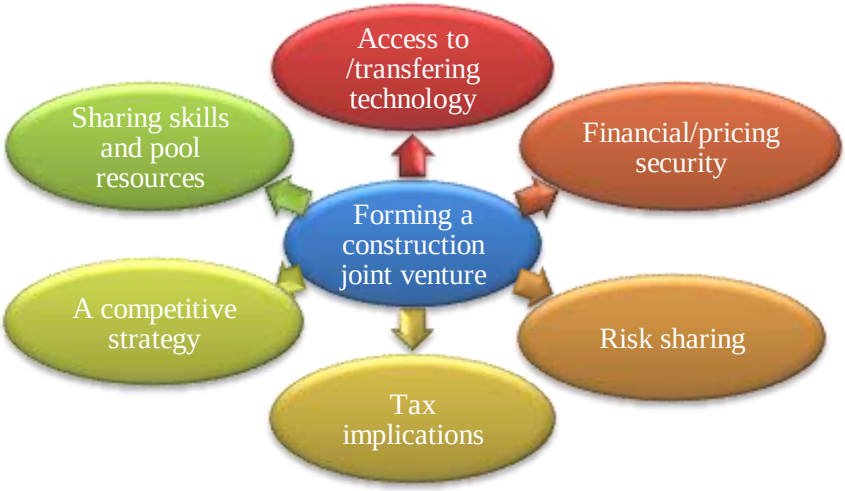

Figure 2.1: Motives of forming a construction joint venture

As Ma and Woo (2014) further stated, forming JVs has become most popular both in developed and developing countries specially when undertaking large-scale construction projects. As an example, local governments in Australia and Japan encourage the private sector to work together and to form joint ventures for better outcomes of large infrastructure projects. Lin and Ho (2012) further verified that the construction joint venture has become one of the major organizational structures used in executing large scale projects. Nevertheless, organizations are forming construction joint ventures to use partner resources to facing the technological advancements, complexity and growing scale of construction projects (Famakin et al., 2012; Zhao et al., 2012). Hence, forming organizational entities like joint ventures is adopting most commonly in both developed and developing countries.

As a developing country, joint venture is becoming most popular method in Sri Lankan construction industry. Further, forming joint ventures is also not new to the Sri Lankan construction industry today. Weddikkara and Devapriya (2000) said that the construction investment in Sri Lanka has followed the economic changes during the last decade and as a result the country has come up with large infrastructure and industrial developments projects however with the technological, managerial and financial deficiencies. Further to authors, the public-sector investment was channeled to infrastructure such as irrigation facilities, and urban development to accommodate economic expansion. In the recent past, from 1990 to 1998, the government's investment has been more towards infrastructure, showing a record average of 5.12% of GDP for the period of nine years. However, most of the construction firms obtain a high percentage of their work through competitive bidding and the nature of client is a key factor affecting both bid/no-bid and percentage mark-up decisions (Dias & Weerasinghe, 1995). As they explained, there are a large number of small and medium scale contractors who utilize other local contractors through sub-contracting and local construction joint ventures.

Hence, there is a tendency to form JVs by construction contractors as a solution for lack of qualifications, resources and technology to undertake large and complex construction projects, especially when undertaking large infrastructure projects. In local JVs, the respective contractors are investing heavily only on qualifications,

machinery, equipment and/or manpower resources to undertaking the project is a major issue where there is a difficulty to find a relevant contractor who invests money rather than the other resources (Wickramasinghe, 2016).

There are various forms of joint ventures can be classified based on the purpose of forming JVs, involvement of partners and the way of proceeding as follows;

- Domestic and multinational
- Contractual joint venture, non-contractual joint ventures
- Integrated and non-integrated
- Local joint ventures and international joint ventures

A joint venture can generally be classified as either domestic or multinational. A domestic joint venture refers to any undertaking in which two or more firms of a given nationality "form continuing relationships, for profit seeking purposes, in which each partner holds some share of equity, has some control, and shares in the risk of the undertaking" (Raveed, 1980). Another classification has introduced by Kale et al. (2013) as, contractual joint venture, non-contractual joint venture, corporate joint venture and Joint Venture Corporation. As Kale et al. (2013) further mentioned, in contractual joint ventures, the conditions, obligations, and liabilities of the parties set forth in a written agreement signed by both parties whilst non-contractual joint venture perform the business with a selected name and the behavior of the parties without a written agreement.

According to study by Norwood and Mansfield (1999) and Estache and Iimi (2008), CJVs are fallen broadly into two categories, as integrated and non-integrated. Integrated or project-based JVs are formed only to perform particular project or to be established as a continuing association of the participants. Non-integrated or strategic joint venture are forming or establishing to be a separate company under the ownership of all parties in the joint venture agreement (Norwood & Mansfield, 1999; Estache & Iimi, 2008). Morledge (2003) have come up with another classification as employer JVs, consultant JVs and contracting JVs by considering main intensions of partners who are involved in the CJVs. However, Chan and Tse (2003 cited Jamil et al., 2008) argued construction joint ventures can mainly be divided as local joint ventures and international joint ventures, consisting with local and multinational partners respectively. It is further supported by Estache and Iimi (2008) by

classifying CJVs as local and foreign joint ventures as illustrated in Figure 2.2. The classification established by Chan and Tse (2003 cited Jamil et al., 2008) can be further understood by Figure 2.2, which is clearly illustrated the classification of joint bidding.

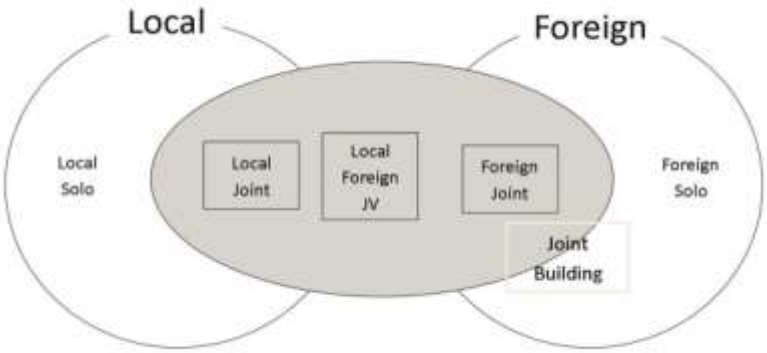

Figure 2.2: Classification of joint bidding

Source: (Estache and Iimi, 2008, p.6)

Based on the key literature reviewed on different forms of joint ventures, local joint ventures are selected in this research by considering the selection of local partners in construction joint ventures. Further, this classification is tallying with the study scope defined in chapter one of this research (refer Section 1.6), therefore used as the main classification for demarcation.

2.2.4 The development process of CJVs

Construction joint ventures are formed for a number of reasons including pooling of resources, sharing of risks, undertaking large and complex projects, entry to a foreign market and business diversification (Minja, 1986; Dalle & Ports, 1999; Kwok, Then & Skitmore, 2000; Adnan & Morledge, 2003). In general joint ventures are not the easiest forms of organisation to manage and operate. Therefore, there must be compelling reasons why parties to a construction contract resort to the formation of a joint venture in contrast to the conventional contractor/subcontractor relationship (Dalle and Ports, 1999). There are numerous strategic motives that partners can have to forminter-organizational relationships. JVs can act as a medium for learning; creating economies of scale and scope; enabling firms to address host government

policies, facilitating entry into new product or geographical markets, helping firms strengthen or consolidate existing market positions or assisting with risk management (Klijn, Reuer, Buckley & Glaister, 2010). Further, JVs facilitate the combination of economic resources, skills and knowledge required for projects. The use of the JV set-up in the construction industry has become necessary in order to secure a large scale project or one that is beyond an individual firm's capability (Carter et al, 1988).

According to Munns et al. (2000), the process of establishing the JV can be considered as a project and will pass through several stages before completion and early stages in this process will be the identification of potential partners and negotiating the terms and condition of the Joint Venture. Munns et al (2000) further demonstrated that the final success of the project and the establishment of the joint venture will depend on the management of the negotiation process.

As Kale et al. (2013) stated that, the life cycle of CJV may include exploratory stage, growth phase, stability phase and collapse. As Kale et al. (2013) further derived, after the exploration, the growth phase of the joint venture could take place. However, joint venture can be collapsed at even this stage if the interest of parties leads to vary. If the partners like to work together, the joint venture comes to stability phase. At this stage even, joint ventures can collapse due to change of interest of parties if the negotiation would not be effective.

The life cycle of construction joint venture is illustrated in Figure 2.3.

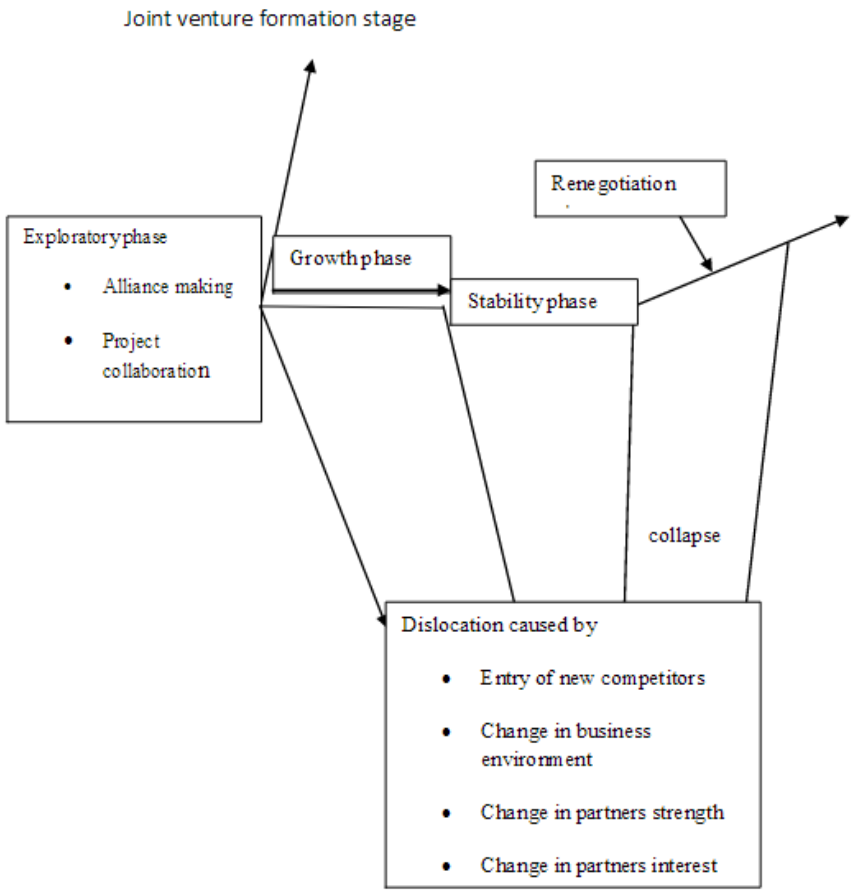

Figure 2.3: Life cycle of a CJV

Source: (Kale et al., 2013)

Figure 2.4 illustrates the JV development process. As Wang (2008) stated, the process consists of two main stages; formation and development stage. The initial analysis, partner selection and design are included in the formation stage whist implementation; management and evaluation are the steps in JV development process as illustrated in Figure 2.4.

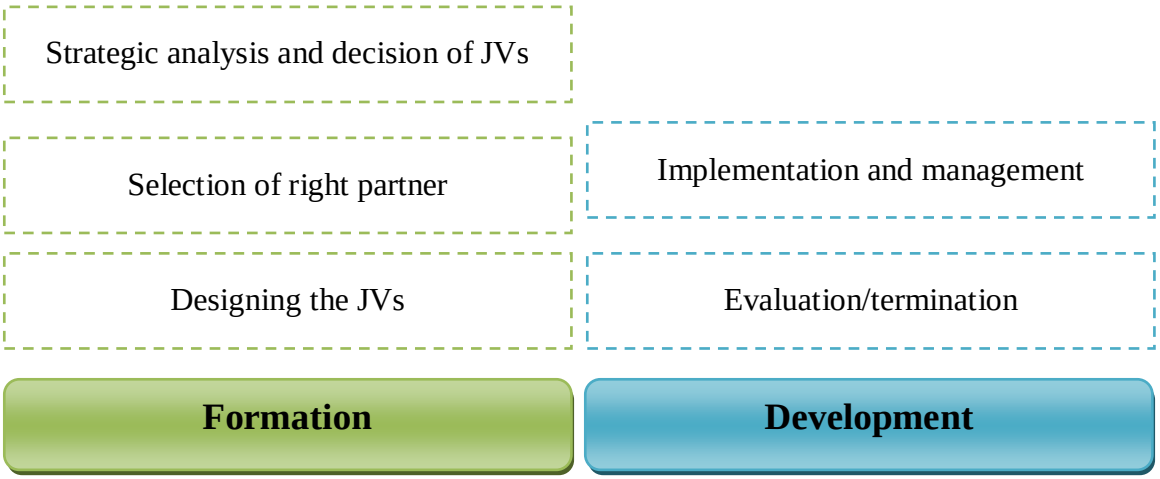

Figure 2.4: The development process of CJVs

Source: (Wang, 2008)

However, formation of joint ventures between construction companies is one of the recent efforts in combating contractor's problem. Most important factors considered during formation of JVs are: contract agreement, financial stability and commitment while key risks associated with JVs are cultural and social differences, delays in approvals and financial risks. In addition, main challenges facing joint ventures are identification of possible risks and joint venture agreement interpretation (Minja, Kikwasi & Thwala, 2012).

2.2.5 Performance of construction joint ventures

The success and better performance of construction joint ventures in terms of time cost and quality may depend on various factors. According to the key literature reviewed, various factors are identified which lead construction joint ventures towards success.

The success or a high performance of construction joint ventures is necessary where major project partners could involve in to the joint venture with mutual understanding (Tan & Ghazail, 2011). As the authors further described, it is significant to maintain a friendly personal contact between leaders of the cooperating organizations in CJV. Hence, careful selection of partner organizations is important for assuring the mutual bond for better performance of CJVs. Further, commitment of joint venture partners, especially key decision makers regarding the continuation

of the mutual bond, relationship, acceptance of goals and willingness to spending resources for the relationship is another factor for joint ventures for its success.

Other than that, it is essential to be sure that a potential partner can produce sufficient financial resources to maintain the ventures. Further, it is suitable to include a clause in the joint venture agreement to cover this factor or aspect of the JV (Tan & Ghazali, 2011; Turner (2002 cited Adnan & Morledge, 2003).

Cooperation behavior between the parent companies help to reduce potentially burdensome monitoring and safeguards costs within the JV. Yan and Gray (1994 cited Adnan & Morledge, 2003) stated that cooperation and management control is another important factor for greater performance which can impact organization's decision and activities. According to Adnan and Morledge (2003), the commitment is also important as it provides a long-term basis, resources and capabilities to the specific needs of the JV for its success. Further, Agarwal (1994 cited Adnan & Morledge, 2003) verified that, having greater experience, understanding, competence and confidence in partner inputs will result in a successful construction joint venture. It is because, with respectable background experience, these partners are anticipated to provide better organizational culture and market conditions at a lower cost than would be incurred by the investor to obtain comparable information (Beamish & Banks, 1987 cited Adnan & Morledge 2003). Therefore, the choice of partner is critical for completion of the particular assignment, where the selection of a proper partner, therefore, is a paramount in significance if the joint venture is to succeed (William & Lilley, 1993 cited Adnan & Morledge, 2003). In addition to that Jeffrey (2001) identified the most critical stages which are reason to be success of JV as pre-planning, partner selection, negotiation and policy agreement and implementation.

Establishing certain strategies by joint venture partners has become important to enhance the performance of construction joint ventures. As Rahman and Kumaraswamy (2005) emphasized that establishment of joint risk management team is important to effectively manage the project risks, ensuring team member trust and confidence in one another's abilities (Ngowi, 2007). And establishing open and reliable lines of communication and collaboration between team members is another strategy for better performance (Doloi, 2009). However, performance of construction joint ventures still remains as an issue of importance throughout the process which is

began with the strategic rationale for entering into a joint venture (Beamish & Lupton, 2009). Same as the other developing countries, performance of local construction joint ventures also has become a critical circumstance in Sri Lankan construction industry with the unavailability of standard or regulatory platform for forming of construction joint ventures. Specially, preparation of correct and effective joint venture agreement has become crucial without such a standard form of agreement which has not been already established.

The next section describes the formal process of preparing joint venture agreement.

2.3 JV Agreement

2.3.1 Preparation of joint venture agreement

The success of the formation of any JV in industry may importantly depend on correct preparation of its joint venture agreement. It is because, the JV agreement should regulate the reimbursement of information when the connection is terminated as well as that disclosures will be subject to confidentiality requirements. The joint venture agreement is a complex document that usually is the product of extensive negotiations between the parties. There is no single standard form of joint venture agreement because there can be a range of characteristics (Minja, Kikwasi & Thwala, 2012). However, the creation of joint ventures typically involves the development of an information exchange agreement that determines what technological and business information will be exchanged (Kogut, 1989). As Miller (2003) and Rowan (2004) deliberate, key characteristic of JV agreement can be identified as follows;

- defines the parties to the agreement
- defines the purposes and objectives of the joint venture
- defines the monetary and non-monetary contributions to be made by each of the parties
- defines the management and structure of the joint venture
- defines the basis on which the participants share in the profits and losses of the joint venture;
- defines the liabilities of the joint venture partners
- provides for a conflict resolution mechanism and a termination mechanisms

As Rowan (2004) further declared, JV agreements may depend on the form of joint venture adopted, such as; joint venture in form of company; joint venture in form of partnership; and joint venture on contractual basis. As Gallagher, Michael and Reade (2014) illustrate in their study, the joint venture agreement in construction may consist of four (04) main key elements, such as, ownership and control of property, sharing of expenses, profit, and losses, active participation in the management of the joint venture, dispute resolution and termination as deliberated in Figure 2.5.

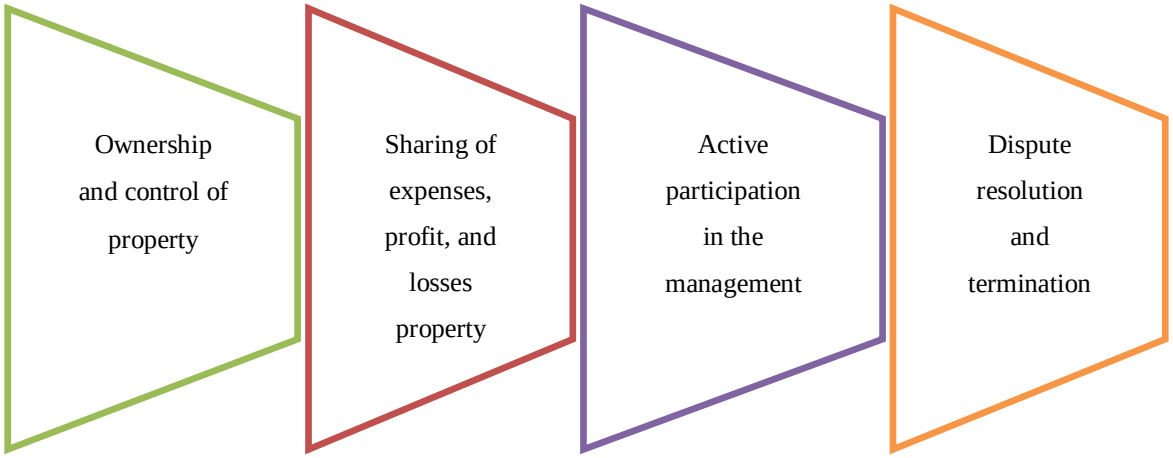

Figure 2.5: Elements of joint venture agreement

Source: (Gallagher, Michael and Reade, 2014)

As Gallagher, Michael and Reade (2014) further mentioned, JV agreement is important for the success of construction joint ventures, and also it should provide for the termination of the joint venture. Even though, there is no specific procedure for preparing JV agreement common for all construction projects, common provisions can be identified which can be considered to prepare a high-quality JV agreement (CIDB, 2004).

- Clearly and comprehensively set contributions that need to be made by each member towards the activities of the joint venture
- Record of the percentage participation by each member in all aspects of the fortunes of the joint venture, such as, risks, rewards, losses and liabilities etc
- Provisions for meaningful input by all members to the policy making and management activities of the joint venture

- Provisions for the establishment of a management body for the joint venture
- Measures to limit losses to the joint venture by the default of a member
- Provisions to promote consensus between the members whilst ensuring that the activities of the joint venture
- Provisions which are sufficiently flexible to allow for joint ventures which differ in nature, objectives, inputs by members, management systems

As existing literature proved, there is no standard strategy to adopt construction joint ventures in most of the developing countries. Similarly in Sri Lanka, there is no any guideline to follow in local context, thus, JV agreements are institutionally developed by local construction contractors by identifying their own requirements; such as, allocation of resources, bid and performance bonding, completion of work, contribution of both parties, profit, loss and other responsibilities, etc. Hence, the deficiency of proper regulatory bound for the formation of JVs in construction industry has led to various issues between both parties in executing the large construction projects in Sri Lanka.

2.4 Issues of CJVs

Construction joint ventures can have high failure rate mainly due its issues (Kalyviotis & Nair, 2013). According to a study by Anderson and Jap (2005), the failure rate of forming joint ventures at anywhere will vary ranging from 30 to 50 percent. Allen (2010) found in his study that nearly 30% of joint ventures in construction industry are resulted in disputes due to various issues. According to Harrigan (2008), apart from the applications and benefits joint ventures in constriction, the JVs' nature is always problematic. According to key literature, the various issues of CJVs were encountered relating to eight major categories (Harrigan, 2008; Kuo et al., 2008) as follows,

- Strategic management
- Partner selection
- Cultural issues
- Performance measurement
- Risk allocation
- Ending of JV
- Financial issues

- Liability and indemnity

One of the main factors that could lead construction joint venture into failure is improper selection of partners. Adnan, Shamsuddin, Supardi and Ahmad (2012) mentioned that the conflicts are occurred due to distrust among parties. As Harzing (2002) stated, some participants do not reveal the true operational agendas, or mislead their partners for their ability to support the agreed responsibilities which could lead joint venture in to failure. Further, when time passes parties learn each other's capabilities, knowledge, expertise, qualifications and that will lead parties either to long time strong relationship or to short-term unstable relationship (Anderson & Jap, 2005). Ozorhon et al. (2008) explained that differences in organizational culture differentiate JV partners based on their management practices, which are deemed essential for the functioning of their respective organizations. Further, when organizations form JVs in different practices, these differences may end result in conflicting behaviors and could lead to misunderstandings and interaction problems.

As Habib and Burnett (2007) stated, incompatibility of objectives, incongruence of domain conceptions and differing perceptions of reality between the channel members could lead to conflicts in construction joint ventures. Therefore, one hypothesised cause of conflict in joint ventures is the possible disparity of goals between the members of the joint venture. Sridharan (1992) argued that construction joint ventures could fail due to hasty associations, unequal negotiating power, wrong choice of the type of JV, sub-contract management, technology transfer and contract closeout. Further, Contractor (1985) and Pan (1996) asserted that each partner in a JV should be enabled to receive a roughly equal proportion of the income gained. Hence, it is necessary to realize by both parties that they must ensure the arrangements which were made initially will not deteriorate with the time. JVs can also suffer drainage of efficiency through leakage of information; not having proper mechanism to measure the performance put them at a disadvantage relative to direct market entry and hierarchies (Agarwal & Ramaswami, 1992).

Han et al. (2005) identified the five failures in joint ventures as follows,

- Inadequate business plan development
- Lack of commitment of top management

- Inadequate development of strategies for market
- Inadequate recognition of demands in a cross cultural environment
- Failures with respect to their political, social and legal and government procedures

According to a study by Kale et al. (2013), other key issues of construction joint ventures can be identified as illustrated in Figure 2.6.

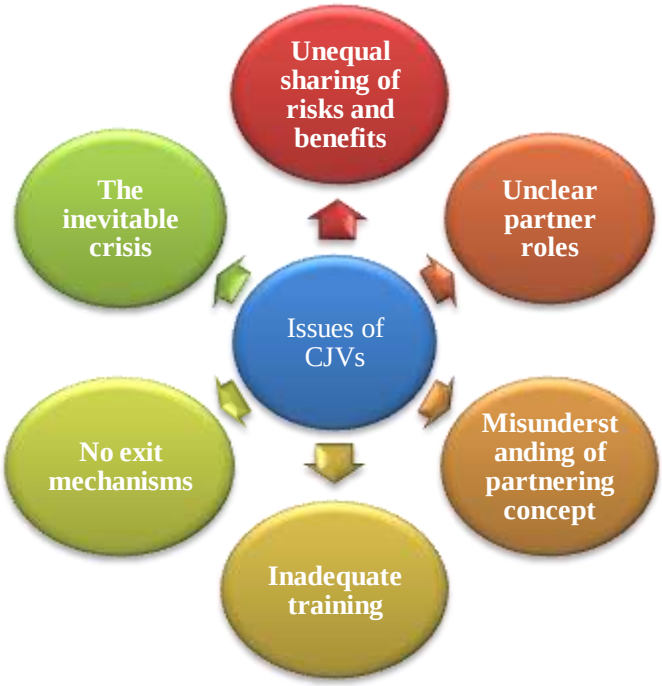

Figure 2.6: Issues of CJVs

Source: (Kale et al., 2013)

As Kale et al. (2013) stated in their study, it is important to having clear role for each party in construction joint ventures. A lack of clarity about how closely the two sides intend to work together is a common problem. Further, both partners should have agreed on their rate of participation and contribution which can be either equal or non-equal participation in construction works. In a venture that has a clear majority owner, the minority partner may be contributing money, brand name, or rights to a technology and have no interests in the day to day decisions. It is further supported by Kuo et al. (2008) that the misunderstanding of joint venture partners is a major issue due to unclear partner roles defined. As Kale et al. (2013) stated, the parents of a proposed partnership must articulate their assumptions and involve key people

during the negotiations to define the contributions they will make and the benefits they expect.

It is another crucial issue where JV partners did not come into an agreement, how the value generated by the venture will be distributed between the parents? Ensuring an equitable risk-benefit ratio is crucial to the longer-term health of the alliance (Kale et al., 2013). Further, joint venture partners could face to commercial risks when undertaking the construction project. These commercial risks include those posed by the vagaries of labour and material shortage, technical and design and changes in government legislation and regulations (Kathy & Albert, 2003). Because of the complex nature of the construction business involving the process, environment, and organization, the participants are widely exposed to a high degree of risk. It is one of the principles underlying the formation of a CJV that it is a means to share the project's potential risk and exposure between more participants (Norwood & Mansfield (1999). Further, issue in profit sharing by JV partners can also be identified another issue in CJVs (Kuo et al., 2008). JV agreement will require each party to indemnify the other members for all losses and damages resulting from a breach of the agreement or misrepresentation by that party unless it could lead CJV to collapsing stage (Norwood & Mansfield, 1999).

According to key literature reviewed, having a way to face unavoidable events which can occur during joint venture operation is an important strategy to end up the JV successfully. It is specially required when something out of the ordinary happens. However, as Kale et al. (2013) stated, not having certain mechanism in JV agreement to face inevitable events could fail the construction joint venture. Having a formal exit mechanism in joint venture can avoid the costly and time-consuming litigation. However, not having such a mechanism that can be followed by JV partners is another critical issue as identified by Kale et al. (2013). Given the short life span of joint ventures, it is surprising that many founders of joint ventures do not seem to pay enough attention to managing partner relations. Inadequate training and misunderstanding of partnering concept are other issues which can be arisen in construction joint ventures where inadequate staff training is the essential reason for JV failure. Further, a thorough knowledge and understanding of the JV process is essential to create partnering success; misunderstanding the JV concept is thus a

major problem for partnering implementation. Also the fair profit motive, like the concept of JV, was not fully understood and supported by the project participants. Hence, misunderstanding of the partnering concept by the project participants could cause a failure in partnering (Kale et al., 2013).

Nevertheless, funding issues can be arisen, where the agreement has not provided consideration on the provisions of funding by JV partners. However, JV must consider how to generate progress payments from the construction projects and how to deal with other additional installments during project operation. This may happen when a partner is unwilling to make additional contributions and in return an increased interest in the venture proportionate to their increased participation (Huwa & Pirie, 2003). Further, Norwood & Mansfield (1999) mentioned that the records and accounts of the JV should be quite separate from those of its members, unless otherwise it could lead to accounting and auditing issues. As Norwood and Mansfield (1999) further declared, each JV member should have the right to audit the records of the JV as well as the records of the participants as they relate to services performed for the JV. According to a study by Sun (1998), JV partners may pursue different options to deal with taxes. Normally the taxable income (or loss) is passed on to the partners who report it on their respective returns. Avoiding double taxation is one of the goals of JV participants unless it could lead to conflicts in CJV.

According to a study by Huwa and Pirie (2003), another main issue is related to liability of JV partners. As Grab (1992) described, a consideration for liability in JV agreement is an important factor to avoid conflicts and disputes in CJVs which can allocate in accordance with the respective interests of the parties in the venture. Accordingly, thirty six (36) issues of eight (08) major categories are identified through literature review by considering the ambiguity surrounding the terminology used by the different authors' best judgement as stated in Table 2.2.

Table 1.2: Issues in CJVs

Major Category	**Identified issues**
Strategic management related issues	Wrong choice of type of JV
	Incompatibility of project objectives
	Disparity of goals between the members of the joint venture
	Inadequate business plan development
	Lack of commitment of top management
	Inadequate development of strategies for market
	Failures with respect to their political, social and legal and government procedures
Partner selection	Not having formal guideline for partner selection
	Unclear partner role of JV partners
	Amount of contribution and participation of JV partners
	Unequal negotiating power of project partners
	Inadequate staff training
	Misunderstanding of partnering concept
Cultural issues	Differing perceptions of reality between the channel members
	Hasty associations of partners
	Inadequate recognition of demands in a cross cultural environment
	Leakage of information to outside parties
Performance	No proper mechanism for performance measurement
	Disagreements on the definition and the measure of performance
Risk allocation	Risk sharing issues by JV partners
	Profit and other benefits sharing issues by JV partners
	Facing losses and damages resulting from a breach

Major Category	Identified issues
	of the agreement or misrepresentation
	Facing unavoidable events
Ending of JV	Not having a formal exit mechanism
	Ineffective conflict resolution between the JV partners
Financial issues	Issues in generating progress payments
	No proper way to deal with additional installments
	Unwilling to make additional contributions by JV partners
	Accounting and auditing issues
Liability and indemnity	Not having predetermined liability of JV partners
	Incompatibility between interpersonal relationships
	Breaking trust and confidence among the partners
	Lack of commitment by partners
	Differences in management styles and organization culture
	Inadequate Corporation of partner organisations

The identified issues are used in subsequent analysis of this research to determine the issues which are critical for construction joint venture failures in Sri Lanka.

2.5 Formulation of the Research Problem

The definitions, applications and the process of construction joint ventures were reviewed through the literature available and the research problem was further verified by identifying the gap between past and current research in similar background. The literature declared that having a proper process for the formation and operation of construction joint ventures is an utmost important to make it successful however, the current process consists of several issues to overcome. With the importance of determining the issues which are critical for construction joint ventures in order to propose probable strategies to overcome, the research problem was formulated as;

"What are the issues which are critical for construction joint ventures in Sri Lanka?"

2.6 Summary

This chapter reviewed the key literature related to construction joint ventures, joint venture procedures and the issues of construction joint ventures so as to provide a comprehensive and detailed background to this research. According to key literature, construction joint venture is defined as a collaboration of two or more construction organizations to allow ease of work towards achieving a common aim through the manipulation of appropriate resources. Nevertheless, the similarities and differences between joint ventures and sub-contracting are also reviewed. Further, the contractual procedures related to the formation and operation of construction joint ventures are identified along with the joint venture agreement. As the main focus of this research, thirty six issues of construction joint ventures were identified related to eight major categories which are used in subsequent analysis.

3.0 RESEARCH METHODOLOGY

3.1 Introduction

This chapter is to clarify the methodological framework used to conduct this research. In relation with the research problem, the research is designed compromising suitable research methods and techniques which are described in subsequent sections of this chapter governing with the research design framework developed. Hence, the most suitable research approach, research method, data collection and analysis techniques are explained appropriately.

3.2 Research Design

A research needs a design or a structure before data collection or analysis commences (Owens, 2003). Further, the choice of a method to employ in any study was dependent upon the nature of the research problem, where the actual suitability of a research method, derives from the nature of the social phenomena to be explored (Noor, 2008).

According to a study by Yin (2009), a research design was a logical sequence that connected the empirical data to a study, initial research questions and, ultimately to its conclusions. As Yin (2009) further stated, a research design was not just a work plan where a thing more than that, with the purpose to avoid the situation in which the evidence does not address the initial research questions. Cresswell (2009) explained that the selection of a research design is based on the nature of the research problem or issue being addressed, the researchers' personal experiences, and the audiences for the study.

The logical sequence of research design for this study could be explained subsequently which has illustrated in Figure 3.1 by depicting how the research design had been developed in order to answer the research question.

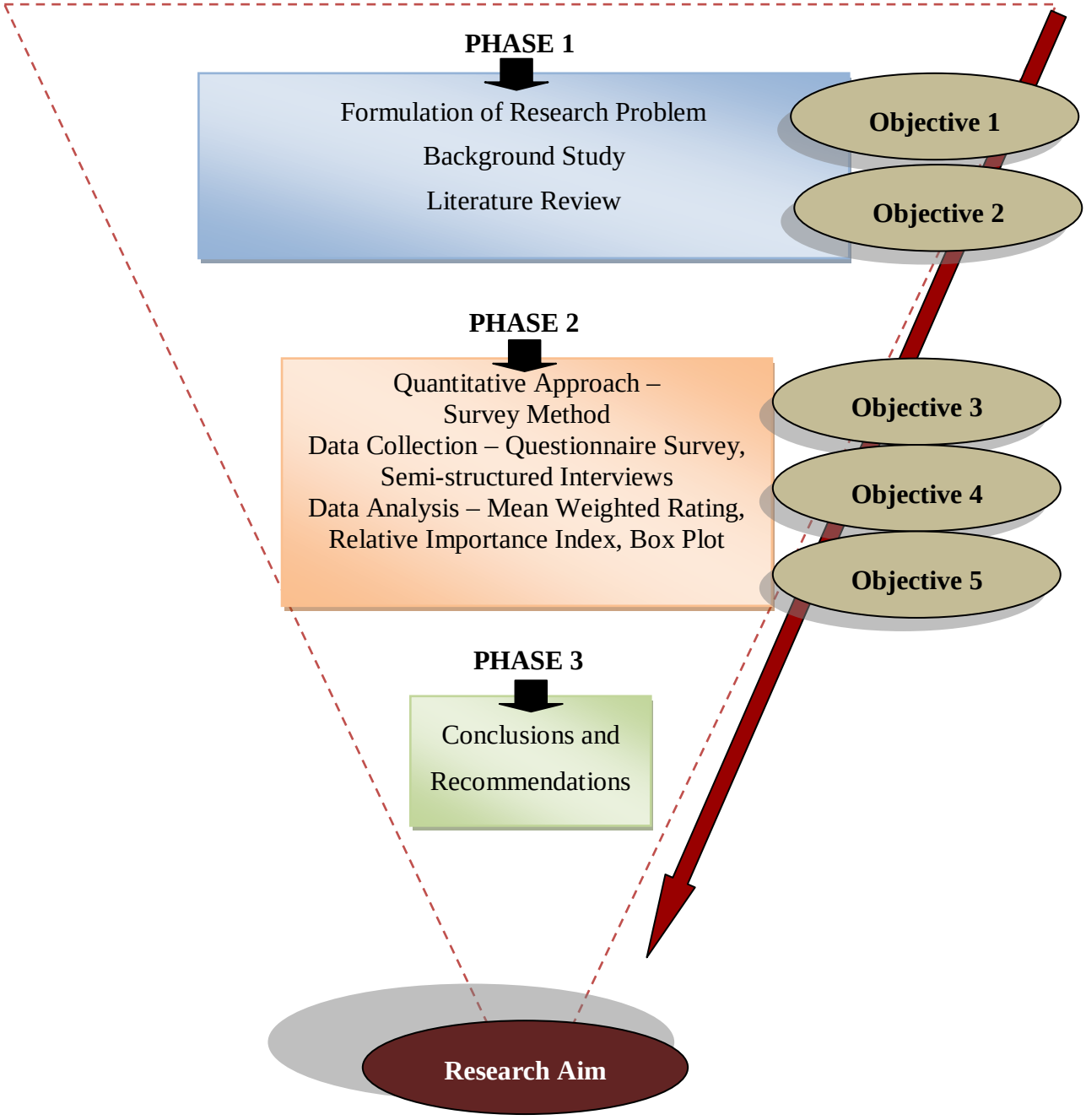

Figure 3.1: Research design framework

As Figure 3.1 illustrates, the research design laid on three phases connecting them towards achieving the research objectives and finally the research aim. The key components of each phase are described subsequently.

3.2.1 Formulation of the research problem

The research problem is formulated by conducting a background study and a comprehensive literature survey as described subsequently.

3.2.1.1 Background study

A background study was carried out through books, journals, articles and publications which were useful in gaining an early understanding and clearly define the research problem considering real situations in the construction industry. The issues of contraction joint ventures, its real practices are studied by further refining the research question, aim and objectives.

3.2.1.2 Research problem statement

The purpose of this research is to determine the issues which are critical for construction joint ventures in Sri Lanka in order to propose probable attributes to overcome. Accordingly, the research question is developed as, "What are the issues which are critical in construction joint ventures in Sri Lanka?"

3.2.1.3 Research aim and objectives

The aim of this research is to find the issues which are critical in construction joint ventures in Sri Lanka.

In order to achieve the aim, following objectives are formulated.

1. To review the concept of 'Joint Ventures' in construction
2. To identify contractual procedures which are applied nationally and internationally in construction joint ventures
3. To identify the issues of construction joint ventures
4. To determine the issues which are critical in construction joint ventures in Sri Lanka
5. To propose probable strategies to overcome the critical issues in construction joint ventures in Sri Lanka

3.2.1.4 Literature review

The literature synthesis was carried out through books, journals, articles and publications to emend the research problem. The major areas of CJVs were

addressed in this chapter including definitions of construction joint ventures, the development process, performance of CJVs, JV agreement and the issues in CJVs. Further, literature synthesis was extended to gain a broader knowledge on research methodology area specially relating to the quantitative research approach to design the research.

3.2.2 Research approach – quantitative approach

The research approach provides specific direction for procedures in a research design (Creswell, 2009). As Yin (2003) mentioned that the qualitative and quantitative research approaches are two main schools of research design whilst mixed method approach has come up by incorporating qualitative and quantitative methods together. As Yin (2003) further explained, surveys and experiments are basically coming under quantitative approaches whilst case study, ethnography, action research and grounded theory are stating under qualitative approaches. In this research, survey method under the quantitative approach had been identified as the most appropriate approach.

3.2.2.1 Justification for survey approach

The survey approach was selected considering the appropriateness of this study. As this research is aimed to determine the issues which are critical for the construction joint ventures in Sri Lanka, survey method is selected. Here case study approach can be overlooked as no need to go for in depth inquiry in to current phenomenon. As well as according to Patton and Applbaum (2003), case studies were more studied for the studies where qualitative data phenomenon. However, the final outcome was quantified other than qualitative in this research. It implied that this study needed a quantitative approach rather than qualitative.

Further, Yin (2003) and Kraemer (2002) suggested that a survey design should be considered when the focus of the study is to answer “what”, “how many” and “how much’ questions whereas a case study would not be an advantageous strategy in this situation. This also justified that the above selected approach was suitable whereas the research problem is developed as “What are the issues which are critical in construction joint ventures in Sri Lanka?”

By considering the above circumstances, survey method under quantitative approach was selected in this research.

3.2.3 Survey design

The survey was designed to conduct in two stages as preliminary survey and the main questionnaire survey.

3.2.3.1 Preliminary survey and implications to main survey

The purpose of conducting a preliminary survey is to further clarify and validate the issues stated in questionnaire developed. The preliminary survey was conducted among the ten (10) selected sample of professionals randomly assorted from the construction organizations in Sri Lanka. Seven (07) responses were yield by giving a response rate of 70%. According to the respondents, few changes were made on the questionnaire as described in section 3.2.3.2 under the "Development of the questionnaire".

3.2.3.2 Questionnaire survey

As the second stage of survey design, the main questionnaire survey was conducted to evaluate the issues in construction joint ventures in Sri Lanka.

Development of the questionnaire

According to previous research studies, designing the data collection instruments is not an easy task specially when designing a questionnaire where it needs high consideration on validity and reliability of data collected. Further, "the internal validity and reliability of the data you collect and the response rate you achieve depend, to a large extent, on the design of your questions, the structure of your questionnaire, and the rigour of your pilot testing. A valid questionnaire will enable accurate data to be collected, and one that is reliable will mean that these data are collected consistently" (Saunders, Lewis & Thornhill, 2009, p. 371).

As the main data collection instrument in this research, questionnaire is developed incorporating two major sections as follows,

Section A: General information about the respondents and factual questions regarding the current practice of CJVs and the possible strategies to overcome the critical issues in CJVs

Section B: Level of influence of issues in CJVs in Sri Lanka

The five point Likert-style rating scale was used and the respondent is asked to rate the given factors considering the level of influence of issues on the formation and operation of construction joint ventures in Sri Lanka (refer appendix 3.1 for the questionnaire developed and a sample filled). Hence, the scale was developed starting from 1- Much lower, 2- Slightly lower, 3- Normal, 4- Slightly higher to 5- Much higher influence.

As the implication made through preliminary survey, few changes were made on the questionnaire to make it valid and suitable to use in the main survey.

As most of the respondents stated, the questionnaire was understandable and suited to use for the main survey where few issues were recognised to explain further for better understanding. Indeed, further clarifications are provided on four (04) issues in CJVs as stated in Table 3.1.

Table 2.1: Implications of preliminary survey to main survey questionnaire

Issues (as presented in questionnaire developed for Preliminary survey)	**Changes made on main survey questionnaire**
▪ Wrong choice of type of JV	▪ Entering to JVs based only on qualification/resources
▪ Inadequate development of strategies for market	▪ Inadequate development of strategies for facing competition in the market
▪ Inadequate staff training	▪ Inadequate training and expertise of facilitators
▪ Misunderstanding of partnering concept	▪ Unfamiliarity and misunderstanding of partnering concept by project participants

Accordingly, the main survey was conducted as the second stage of data collection by using the questionnaire developed based on implications of the preliminary survey. The details of main questionnaire survey are described subsequently.

Population and sample selection

The success of questionnaire depends mainly on the careful selection of the panel of experts. The experts should have extensive working experience in the construction industry and should have a detailed knowledge and more than five (05) years of experience in construction joint ventures. Therefore, the target population is the prominent professionals who are engaged in CJVs in Sri Lanka. Professionals like project managers, civil engineers and quantity surveyors of construction organizations were selected for the data collection.

According to a study by Chan, Yung, Lam, Tam and Chueng (2001), the sample size should be of anywhere from 10 to 50 participants. Further, a sample size of 30 or more would result in a sampling distribution closer to normal distribution and it provides a useful rule of thumb for the smallest number in each category within the overall sample (Saunders, et al., 2009; Stutely, 2003 as cited in Saunders, et al., 2009). Thus, a sample of 30 professionals is decided to be a reasonable sample. The random sample of 40 prominent professionals in the construction industry was selected to distribute questionnaires in the purpose of receiving targeted 30.

Distribution of questionnaire and response rate

The main questionnaire survey was conducted among a random sample of forty (40) construction professionals who are currently working in construction industry and having knowledge and more than five (05) years of experience in CJVs. The questionnaires were distributed through emails and handed over manually to ensure easy and quick response.

Table 3.2: Response rate

Distribution of Questionnaires	Number of Questionnaires distributed	Number of Questionnaires returned	Response rate
To project managers	07	05	71%
To engineers	11	08	73%
To quantity surveyors	15	10	67%
To contract administrators	07	05	71%
Total	**40**	**28**	**70%**

As Table 3.2 indicates, 28 questionnaires were returned from the distributed questionnaires of 40. Hence, the main survey yielded a response rate of 70%. As verified by Nulty (2008), 50% is regarded as an acceptable response rate in social research studies. As Nulty (2008) further mentions, if it exceeds 60%, the survey is desirable and equal to the normal distribution. Nevertheless, any sample with size greater than the threshold of 30 can also be considered as a large sample (Sutrisna, 2004). Thus, the sample size of 70% obtained in this survey was considered as an adequate response rate to consider in subsequent data analysis.

3.2.3.3 Multiple choice of data collection techniques

Adding more than one data collection technique could increase the reliability and validity of data in any research. Further, it may also help for data triangulation to construct internal and external validity (Harris & Brown, 2010). The choice of multiple data collection techniques over single method generates benefits to research, especially for data validation purposes (Saunders, et al., 2009). Considering the above, both questionnaire and semi-structured interview techniques were used in this research. As this research focused on quantitative phenomenon, questionnaire survey was selected as primary data collection technique while it linked to semi-structured interviews, which were conducted among selected experts in the main survey.

Altogether, five (05) semi-structured interviews were conducted with experts in the field of construction joint ventures.

The profile of interviewees is stated in Table 3.3.

Table 3.3: Profile of interviewees

Code	**Designation**	**Years of Experience**
E1	Project Manager	10 years
E2	Contract Administrator	08 years
E3	Senior Quantity Surveyor	06 years
E4	Quantity Surveyor	05 years
E5	Project Manager	12 years

The respondents were asked to propose the probable strategies to overcome the identified critical issues of CJVs in Sri Lanka.

3.2.4 Data analysis techniques

The data collected through questionnaires was analyzed in two stages. As the first stage, descriptive statistical analysis techniques of Mean Weighted Rating (MWR) and Relative Importance Index (RII) were used to evaluate the collected data. Based on the RII and MWR values, critical issues were determined. In the second stage, the critical issues were further evaluated and validated by using Box and Whisper Plot.

3.2.4.1 Mean Weighted Rating (MWR)

A mean weighted rating will be computed for each issue of CJVs to deliver an indication of the importance level of each factor in the questionnaire survey.

$$\text{Mean Weighted Rating} = \frac{\sum (V_i \times F_i)}{n}$$

Where, Vi - Rating of each Performance indicator

Fi - Frequency of Responses

n - Total number of responses

Further, "the inter-quartile range of mean value is normally chosen where there are extreme data values that need to be ignored" (Sounders et al., 2009). In this research, the critical issues under each category were analysed based on MWR.

$$IQR = Q3 - Q1$$

Further, most of the researches stated that there is no considerable value if it is less than MWR of 3.00 (Sivakumaran, 2014).

3.2.4.2 Relative Importance Index (RII)

Relative Importance Index will be used to assess and prioritize the issues of CJVs according to the relative importance of each factor while further justifying with the MWR. Respondents were requested to rate five scales in term of very low influence to the very high influence.

$$RII_j = \frac{\sum_{i=1}^{n} R_{ji}}{nA}$$

j = factor

i = response

n = sample size

R = rank given

A = highest rank possible

3.2.4.4 Box and Whisper Plot

"A box plot or box and whisker diagram is a convenient way of visually summarizing a distribution" (Bornmann, Mutz, Neuhaus & Daniel, 2008, p.96). The box-and-whisker or box plot is used as a method of plotting the continuous data relate to quantitative variables (Freeman & Julious, 2005). As they further mentioned, box plots are functional in comparing the distribution of the data across several groups. In the box plot, the box contains the middle 50% of the data, with lowest 25% of the data lying below it and the highest 25% of the data lying above it. In fact the upper and lower edges represent a particular quantity called the inter-quartile range. The horizontal line in the middle of the box represents the median value, the value such that half of the observations lie below this value and half lie above it. The whiskers extend to the largest and smallest values excluding the outlying values. The outlying values are those values more than 1.5 box lengths from the upper or lower edges, and are represented as the dots outside the whiskers (Freeman & Julious, 2005).

In this study, the box plot was drawn by calculating the 90^{th}, 10^{th}, first quartile, second quartile/ median (Q2) and third quartile (Q3) of the data distribution of the critical issues of CJVs. The distribution of the data across the critical issues were compared and justified by considering the majority of response.

3.2.5 Conclusions and recommendations

As the final stage of data analysis, probable strategies to overcome the critical issues of CJVs were recognised. Finally, conclusions and recommendations were derived through data analysis and findings by ensuring the better fulfillment of research aim and objectives.

3.3 Summary

This chapter denoted the research methodological framework of the research study, where survey method under quantitative phenomenon was selected as the most suitable research approach for conducting this research based on several justifications. The survey was designed to conduct in two stages as preliminary survey and the main questionnaire survey. As the purpose of conducing preliminary survey, fewer changes were made on the questionnaire to make it valid and suitable to use in the main questionnaire survey. The main survey was conducted on forty professionals who are engaged in CJVs in Sri Lanka and having a detailed knowledge and more than five (05) years of experience in the relevant field. The data collected through survey was analysed by using Mean Weighted Rating (MWR) and Relative Importance Index (RII) to identify the issues which are critical for CJVs in Sri Lanka. The critical factors were further evaluated and validated by using the box plot.

4.0 DATA ANALYSIS AND FINDINGS

4.1 Introduction

This chapter intends to presents the analysis of the data which were collected through questionnaire survey and accordingly the key research findings derived. As the fourth objective of the research, issues which were identified under the categories of strategic management, partner selection, cultural issues, risk allocation, financial issues, liability and indemnity, ending of CJV are evaluated to determine the issues which are critical in construction joint ventures in Sri Lanka. Accordingly, probable strategies are proposed to overcome the critical issues in CJVs in Sri Lanka in subsequent sections of this chapter.

4.2 Demographic Information

The purpose of this section is to presents the demographic information of respondents where it provides an overview of the expertise and experience of the professionals selected. Further, it helps to improve the credibility and confidence in the research findings.

The respondents who were engaged in this research represents the construction professionals those who have engaged in CJVs. Experts from both contractor organisations and consultant organisations were selected for the data collection since these two organisations are the entities that form the CJVs in the construction industry. Therefore, the sample is represented by the experts from both types of organisations to cover all the attributes related to issues of joint ventures. Figure 4.1 presents the demography of the selected sample as per the type of organisation considered.

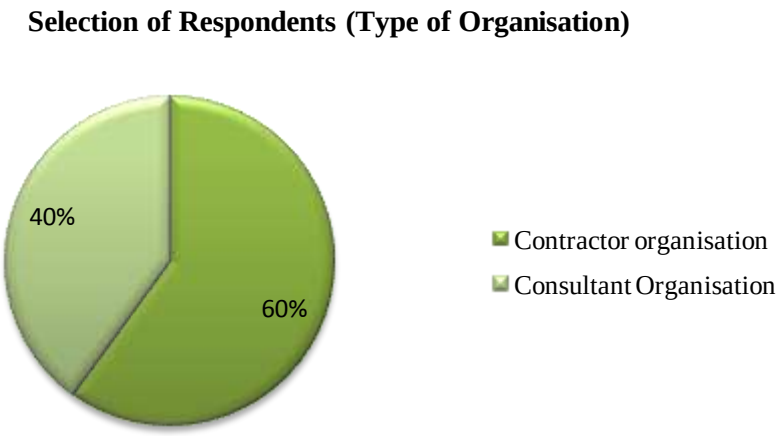

Figure 4.1: Selection of respondents (type of organisation)

As Figure 4.1 illustrates, out of 40 experts, 60% were selected from contractor organizations. The rest of 40% respondents were selected from consultant organizations. The majority of the experts were selected from contractor organizations to represent the population as CJVs are highly practiced in contractor organisations compared to consultant organisations in Sri Lanka.

The composition of sample consists of 07 project managers, 11 engineers, 15 quantity surveyors and 07 contract administrators. Further, the selected sample of the professionals in the construction industry has dealt with CJV and who have knowledge of particular subject research related. Since the quantity surveyors are the professionals who mostly engaged in CJVs than other professionals, the quantity surveyors contribution is highly encountered for the sample of the research. Figure 4.2 shows the level experience of selected professionals in the field of CJVs where it can be considered as another attribute which demonstrates the capacity of the sample selected in the research. The level of experience was considered under the three levels such as 5 to 10 years, 10 to 15 years and more than 15 years.

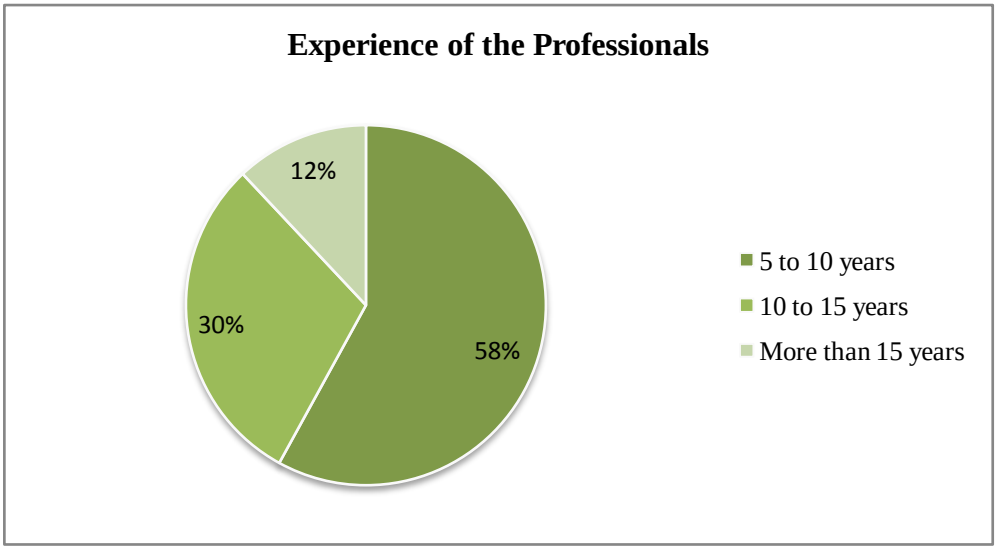

Figure 4.2: Experience of professionals

As illustrated in Figure 4.2, in the selected sample, all most all respondents have had more than 05 years of experience in CJVs. The majority of professionals (58%) have had 5 to 10 years of experience in the field of CJVs whereas 30% and 12% of professionals have 10 to 15 years and more than 15 years of experience respectively. Thus, the sample showed highest capacity to engage in this research based on the level of experience.

The section 4.3 is intended to presents the data analysis and key research findings.

4.3 Data Analysis and Findings

The data analysis process consists of two stages. Data analysis stage one intends to determine the critical issues of CJVs that are required to be overcome. Hence, the data collected through questionnaire survey on thirty six (36) issues which were identified from key literature are analysed by using WMA and RII techniques. The second stage of data analysis is used to further evaluate and validate the data distribution of critical issues of CJVs which were determined in stage one. The box plot was finally drawn by calculating the first quartile (Q1), second quartile/ median (Q2) and third quartile (Q3) of the data distribution of the critical issues of CJVs.

Accordingly, the data analysis mainly consists of two stages as follows;

Stage one - Assessment of critical issues in CJVs

Stage two – Evaluation and validation of critical issues in CJVs

4.3.1 Stage one - Assessment of the critical issues in CJVs

The identified issues of CJVs were considered in data analysis (stage one) to determine the critical issues that need to be overcome in order to reduce CJV failures. Accordingly, thirty six (36) issues under the eight (08) major categories were considered. The Mean Weighted Rating (MWR) and Relative Importance Index (RII) were calculated for each issue of CJVs based on the data collected through the questionnaire survey (Refer Appendix 4.1 for the detailed table of calculations).

The Mean Weighted Rating (MWR) and Relative Importance Index (RII) calculations and related analysis are presented under the eight major sections as follows,

- Strategic management related issues
- Partner selection related issues
- Cultural issues
- Performance related issues
- Risk allocation related issues
- Financial issues
- Liability and indemnity related issues
- Issues at the ending of CJVs

The statistical analysis and results of issues related to the each category are presented subsequently.

4.3.1.1 Strategic management related issues

This includes issues related to the strategic management of CJVs such as, entering to CJVs based only on qualification/resources, incompatibility of project objectives, disparity of goals between the members of the joint venture, inadequate business plan development, lack of commitment of top management, inadequate development of strategies for market, failures with respect to their political, social and legal and government procedures as stated in Figure 4.3.

Strategic Management
Entering to JVs based only on qualification/resources
Incompatibility of project objectives
Disparity of goals between the members of the joint venture
Inadequate business plan development
Lack of commitment of top management
Inadequate development of strategies for market
Failures with respect to their political, social and legal and government procedures
Entering to JVs based only on qualification/resources

Figure 4.3: Strategic management related issues

The calculation of MWR and RII values of each issue are presented in Table 4.1.

Table 4.1: Assessment of critical issues (strategic management related)

Issues	MWR	RII	Rank
Entering to JVs based only on qualification/resources	4.071	0.81	1
Inadequate business plan development	3.964	0.79	2
Disparity of goals between the members of the joint venture	3.536	0.71	3
Inadequate development of strategies for facing competition in the market	3.500	0.70	4
Failures with respect to their political, social and legal and government procedures	3.036	0.61	5
Incompatibility of project objectives	2.929	0.59	6
Lack of commitment of top management	2.964	0.59	7

According to the statistical analysis shown in Table 4.1, the issues related to the strategic management of CJVs were ranked accordingly. According to the evaluation, 'entering to JVs based only on qualification/resources' showed the top highest rank among the other issues with the MWR of 4.071 and RII of 0.81. The second highest ranked issue in CJVs was 'inadequate business plan development' which showed second highest MWR of 3.964 and RII of 0.79. The disparity of goals between the members of the joint venture (MWR=3.536, RII=0.71) and inadequate development of strategies for facing competition in the market (MWR=3.500, RII=0.70) were ranked with third and fourth highest ranks among the other issues. However, failures with respect to their political, social and legal and government procedures (MWR=3.036, RII=0.61), incompatibility of project objectives (MWR=2.929, RII=0.59) and lack of commitment of top management (MWR=2.964,

RII=0.59) were identified as least priority issues where they were ranked with firth, sixth and seventh rankings accordingly. By considering the relative performance of each issue, five factors were identified as critical issues of CJVs under the category of strategic management which showed MWR value above 3.0 and the RII value above 0.6. Accordingly, entering to JVs based only on qualification/resources, inadequate business plan development , disparity of goals between the members of the joint venture, inadequate development of strategies for facing competition in the market and failures with respect to their political, social and legal and government procedures were identified as critical issues of CJVs under this category.

4.3.1.2 Partner selection related issues

Six (06) partner selection related issues were identified by reviewing key literature such as, not having formal guideline for partner selection, unclear partner role of JV partners, amount of contribution and participation of JV partners, unequal negotiating power, inadequate staff training and the misunderstanding of partnering concept (Figure 4.4).

Partner Selection
Not having formal guideline for partner selection
Unclear partner role of JV partners
Amount of contribution and participation of JV partners
Unequal negotiating power
Inadequate staff training
Misunderstanding of partnering concept

Figure 4.4: Partner selection related issues

Accordingly, the MWR and RII values of each issue were calculated which are shown in Table 4.2.

Table 4.2: Assessment of critical issues (Partner selection related)

Issues	**MWR**	**RII**	**Rank**
Not having formal guideline for partner selection	4.214	0.84	1
Amount of contribution and participation of JV partners	3.571	0.71	2
Unclear partner role of JV partners	3.286	0.66	3
Inadequate training and expertise of facilitators	3.286	0.66	3
Unequal negotiating power of project partners	2.786	0.56	5

Unfamiliarity and misunderstanding of partnering concept by project participants	2.643	0.53	6

As per the calculation of MWR value and relative importance index (RII value) of partner selection related issues of CJVs (as shown in table 4.2), not having formal guideline for partner selection was ranked as highest important factor which showed high MWR value of 4.214 and RII value of 0.84. The second ranked factor of an amount of contribution and participation of JV partners showed MWR values of 3.571 and RII values of 0.71. The third and fourth factors of unclear partner role of JV partners and inadequate training and expertise of facilitators showed similar results (MWR=3.286, RII=0.66), thus, ranked as third priority factors. The factors of unequal negotiating power of project partners and unfamiliarity (MWR=2.786, RII=0.56) and misunderstanding of partnering concept by project participants (MWR=2.643, RII=0.53) were ranked as fifth and sixth factors accordingly. The critical issues under the category of partner selection were derived by considering the norm of MWR (above 3.0) and RII (above 0.6). Hence, the factors of not having formal guideline for partner selection, amount of contribution and participation of JV partners, unclear partner role of JV partners and inadequate training and expertise of facilitators were identified as critical issues of CJVs in Sri Lanka.

4.3.1.3 Cultural issues

As identified in key literature reviewed, the cultural issues of CJVs were identified as differing perceptions of reality between the channel members, hasty associations of partners, inadequate recognition of demands in a cross cultural environment and leakage of information to outside parties which are illustrated in Figure 4.5.

Cultural Issues
Differing perceptions of reality between the channel members
Hasty associations of partners
Inadequate recognition of demands in a cross cultural environment
Leakage of information to outside parties

Figure 4.5: Cultural issues

In order to determine the critical cultural issues of CJVs, MWR and RII values were calculated as shown in Table 4.3.

According to the statistical analysis as shown in Table 4.3, the cultural related issues were ranked. Inadequate recognition of demands in a cross cultural environment was

ranked as first priority factor with the MWR value of 3.643 and the RII value of 0.73. The factors of leakage of information to outside parties (MWR=3.071, RII=0.61), hasty associations of partners (MWR=2.964, RII=1.59) and differing perceptions of reality between the channel members (MWR=2.571, RII=0.51) were ranked accordingly with second, third and fourth rankings.

Table 4.3: Assessment of critical issues (cultural related)

Issues	MWR	RII	Rank
Inadequate recognition of demands in a cross cultural environment	3.643	0.73	1
Leakage of information to outside parties	3.071	0.61	2
Hasty associations of partners	2.964	0.59	3
Differing perceptions of reality between the channel members	2.571	0.51	4

Based on the calculation of MWR and RII values of each factor, the critical issues were determined. Hence, first two factors of inadequate recognition of demands in a cross cultural environment and leakage of information to outside parties were identified as critical contractual issues where they showed high MWR and RII values above the norm (MWR>3.0, RII>0.6) considered.

4.3.1.4 Performance related issues

As presented in Figure 4.6, two performance related issues of CJVs can be identified as, no proper mechanism for performance measurement and disagreements on the definition and the measure of performance.

Performance Related Issues
No proper mechanism for performance measurement
Disagreements on the definition and the measure of performance

Figure 4.6: Performance related issues

In order to determine the critical issues of CJVs related to their performance, MWR and RII values were calculated as shown in Table 4.4.

Table 4.4: Assessment of critical issues (performance related)

Issues	MWR	RII	Rank
No proper mechanism for performance measurement	3.536	0.71	1

Disagreements on the definition and the measure of performance	2.857	0.57	2

According to the statistical analysis performed, the factors of performance such as, no proper mechanism for performance measurement and disagreements on the definition and the measure of performance were ranked. No proper mechanism for performance measurement was ranked as first priority factor with the MWR vale of 3.536 and II value of 0.71. The second ranking was given to the factor of disagreements on the definition and the measure of performance (MWR=2.857, RII=0.57). Based on the calculation of MWR and RII values of each factor, no proper mechanism for performance measurement was identified as critical issue of CJVs in Sri Lanka under this category which showed MWR and RII value above the norm (MWR>3.0, RII>0.6) considered.

4.3.1.5 Risk allocation related issues

This consists of the issues related to the risk allocation of CJVs. Figure 4.7 presented the identified issues related to the risk allocation of CJVs such as, risk sharing issues by JV partners, profit and other benefits sharing issues by JV partners, facing losses and damages resulting from a breach of the agreement or misrepresentation and facing unavoidable events.

Risk Allocation
risk sharing issues by JV partners
profit and other benefits sharing issues by JV partners
facing losses and damages resulting from a breach of the agreement or misrepresentation
facing unavoidable events

Figure 4.7: Risk allocation related issues

In order to determine the critical cultural issues of CJVs, MWR and RII values were calculated as shown in Table 4.5.

Table 4.5: Assessment of critical issues (risk allocation related)

Issues	**MWR**	**RII**	**Rank**
Facing losses and damages resulting from a breach of the agreement or misrepresentation	4.071	0.81	1
Risk sharing issues by JV partners	3.964	0.79	2

Profit and other benefits sharing issues by JV partners	3.536	0.71	3
Facing unavoidable events	3.071	0.61	4

As per the statistical analysis shown in Table 4.5, facing losses and damages resulting from a breach of the agreement or misrepresentation was obtained the highest rank (MWR=4.071, RII=0.81) where risk sharing issues by JV partners (MWR=3.964, RII=0.79), profit and other benefits sharing issues by JV partners (MWR=3.536, RII=1.71) and facing unavoidable events (MWR=3.071, RII=0.61) issues were obtained second, third and fourth rankings accordingly. Thus, all four factors were determined as critical factors by considering the norm of MWR (above 3.0) and RII (above 0.6).

4.3.1.6 Financial issues

Financial issues of CJVs consist of issues in generating progress payments, no proper way to deal with additional installments, unwilling to make additional contributions by JV partners, accounting and auditing related issues and issues in generating progress payments as presented in Figure 4.8.

Financial Issues
Issues in generating progress payments
No proper way to deal with additional installments
Unwilling to make additional contributions by JV partners
Accounting and auditing related issues

Figure 4.8: Financial issues

In order to determine the critical financial issues of CJVs, MWR and RII values were calculated as shown in Table 4.6.

Table 4.6: Assessment of critical issues (Financial issues related)

Issues	**MWR**	**RII**	**Rank**
Issues in generating progress payments	3.786	0.76	1
Unwilling to make additional contributions by JV partners	3.036	0.75	2
No proper way to deal with additional installments	3.750	0.61	3
Accounting and auditing related issues	2.964	0.59	4

The statistical analysis shown in Table 4.6 derived that the issues in generating progress payments has obtained highest MWR of 3.786 and RII of 0.76 values among the other issues which thus ranked as first priority factor. Further, unwilling to make additional contributions by JV partners (MWR=3.036, RII=0.75), no proper way to deal with additional installments (MWR=3.750, RII=0.61) and accounting and auditing related issues (MWR=2.964, RII=0.59) were ranked as second, third and fourth rankings accordingly.

Thus, the first three factors such as issues in generating progress payments, unwilling to make additional contributions by JV partners and no proper way to deal with additional installments were determined as critical issues in CJVs in Sri Lanka under this category.

4.3.1.7 Liability and indemnity related issues

This consists of six (06) issues such as, not having predetermined liability of JV partners, incompatibility between interpersonal relationships, breaking trust and confidence among the partners, lack of commitment by partners, differences in management styles and organization culture and inadequate corporation of partner organizations as illustrated in Figure 4.9.

Liability and Indemnity
Not having predetermined liability of JV partners
Incompatibility between interpersonal relationships
Breaking trust and confidence among the partners
Lack of commitment by partners
Differences in management styles and organization culture
Inadequate corporation of partner organisations

Figure 4.9: Liability and indemnity related issues

The critical issues in CJVs under this category were determined by calculating the MWR and RII values as shown in Table 4.7.

Table 4.7: Assessment of critical issues (liability and indemnity related)

Issues	**MWR**	**RII**	**Rank**
Breaking trust and confidence among the partners	3.679	0.74	1
Not having predetermined liability of JV partners	3.643	0.73	2

Lack of commitment by partners	3.357	0.67	3
Inadequate corporation of partner organisations	3.357	0.67	3
Incompatibility between interpersonal relationships	2.929	0.59	5
Differences in management styles and organization culture	2.929	0.59	5

As Table 4.7 shows, the liability and indemnity related issues were ranked based on their MWR and RII values. Among the other issues, breaking trust and confidence among the partners and not having predetermined liability of JV partners were obtained first and second rankings with the MWR values of 3.679 and 3.643 accordingly. Further, the RII values of first two ranked issues are 0.74 and 0.73. However, the issues of the lack of commitment by partners and an inadequate corporation of partner organizations were obtained similar results (MWR=3.357, RII=0.67) where they were ranked as third priority factors. The least two factors of incompatibility between interpersonal relationships and differences in management styles and organization culture were also showed a similar result (MWR=2.929, RII=0.59).

Hence, the issues of breaking trust and confidence among the partners, not having predetermined liability of JV partners, lack of commitment by partners and an inadequate corporation of partner organisations showed MWR and RII values above 3.0 and 0.6 accordingly were determined as critical issues in CJVs in Sri Lanka under the category of liability and indemnity.

4.3.1.8 Issues at the ending of CJVs

The ending procedure of CJVs consists of several issues such as, not having a formal exit mechanism and ineffective conflict resolution between the JV partners as presented in Figure 4.10.

Ending of CJVs
Not having a formal exit mechanism
Ineffective conflict resolution between the JV partners

Figure 4.10: Issues at ending of CJVs

The critical issues of CJVs relating to the ending procedure were determined by calculating the MWR and RII values as shown in Table 4.8.

Table 4.8: Assessment of critical issues (ending of CJV related)

Issues	MWR	RII	Rank
Not having a formal exit mechanism	3.393	0.68	1
Ineffective conflict resolution between the JV partners	3.286	0.66	2

According to the statistical analysis (Table 4.8), under this category, not having a formal exit mechanism (MWR=3.393, RII=0.68) was ranked as first priority factor while ineffective conflict resolution between the JV partners (MWR=3.286, RII=0.66) was ranked as second priority factor. As two factors obtained MWR and RII values above the norm considered (MWR>3.0, RII>0.6) in analysis, both factors were determined as critical issues of CJVs in Sri Lanka.

4.3.1.9 Ranking of critical issues of CJVs (data analysis – 1)

The issues identified by reviewing key literature were evaluated to identify the critical issues of CJVs in Sri Lanka. Twenty five (25) issues were identified as the critical issues in CJVs. The critical issues which were extracted from predetermined categories were ranked accordingly by considering the MWR and RII values as illustrated in Table 4.9.

Table 3.9: Ranking of critical issues in CJVs (data analysis – 1)

Critical Issues in CJVs	MWR	RII	Rank
Not having formal guideline for partner selection	4.21	0.84	1
Facing losses and damages resulting from a breach of the agreement or misrepresentation	4.07	0.81	2
Entering to JVs based only on qualification/resources	4.07	0.81	2
Inadequate business plan development	3.96	0.79	4
Risk sharing issues by JV partners	3.96	0.79	4
Issues in generating progress payments	3.79	0.76	6
Unwilling to make additional contributions by JV partners	3.75	0.75	7
Breaking trust and confidence among the partners	3.68	0.74	8
Inadequate recognition of demands in a cross cultural environment	3.64	0.73	9
Not having predetermined liability of JV partners	3.64	0.73	9
Amount of contribution and participation of JV partners	3.57	0.71	11

Critical Issues in CJVs	MWR	RII	Rank
Profit and other benefits sharing issues by JV partners	3.54	0.71	12
No proper mechanism for performance measurement	3.54	0.71	12
Disparity of goals between the members of the joint venture	3.54	0.71	12
Inadequate development of strategies for facing competition in the market	3.50	0.70	15
Not having a formal exit mechanism	3.39	0.68	16
Inadequate corporation of partner organisations	3.36	0.67	17
Lack of commitment by partners	3.36	0.67	17
Unclear partner role of JV partners	3.29	0.66	19
Ineffective conflict resolution between the JV partners	3.29	0.66	19
Inadequate training and expertise of facilitators	3.29	0.66	19
Facing unavoidable events	3.07	0.61	22
Leakage of information to outside parties	3.07	0.61	22
Failures with respect to their political, social and legal and government procedures	3.04	0.61	22
No proper way to deal with additional installments	3.04	0.61	22

According to the analysis of relative importance of each factor, twenty five factors were determined as critical issues in CJVs in Sri Lanka where not having formal guideline for partner selection (MWR=4.21; RII=0.84), entering to JVs based only on qualification/resources (MWR=4.07; RII=0.81) and facing losses and damages resulting from a breach of the agreement or misrepresentation (MWR=4.07; RII=0.81) were identified as top ranking factors accordingly with first and second priorities. Further, the inadequate business plan development (MWR=3.96; RII=0.79), risk sharing issues by JV partners (MWR=3.96; RII=0.79), issues in generating progress payments (MWR=3.79; RII=0.76), unwilling to make additional contributions by JV partners (MWR=3.75; RII=0.75), breaking trust and confidence among the partners (MWR=3.68; RII=0.74), inadequate recognition of demands in a cross cultural environment (MWR=3.64; RII= 0.73) and not having predetermined liability of JV partners (MWR= 3.64; RII= 0.73) were ranked with fourth, sixth, seventh, eighth, and ninth rankings. Facing unavoidable events (MWR= 3.07; RII=0.61),leakage of information to outside parties and failures with respect to their political, social, legal and government procedures (MWR= 3.07; RII=0.61) and no

proper way to deal with additional installments (MWR= 3.04; RII=0.61) were ranked as least critical factors of CJVs in Sri Lanka.

The relative importance of critical issues which were extracted from eight major categories is shown in Figure 4.11.

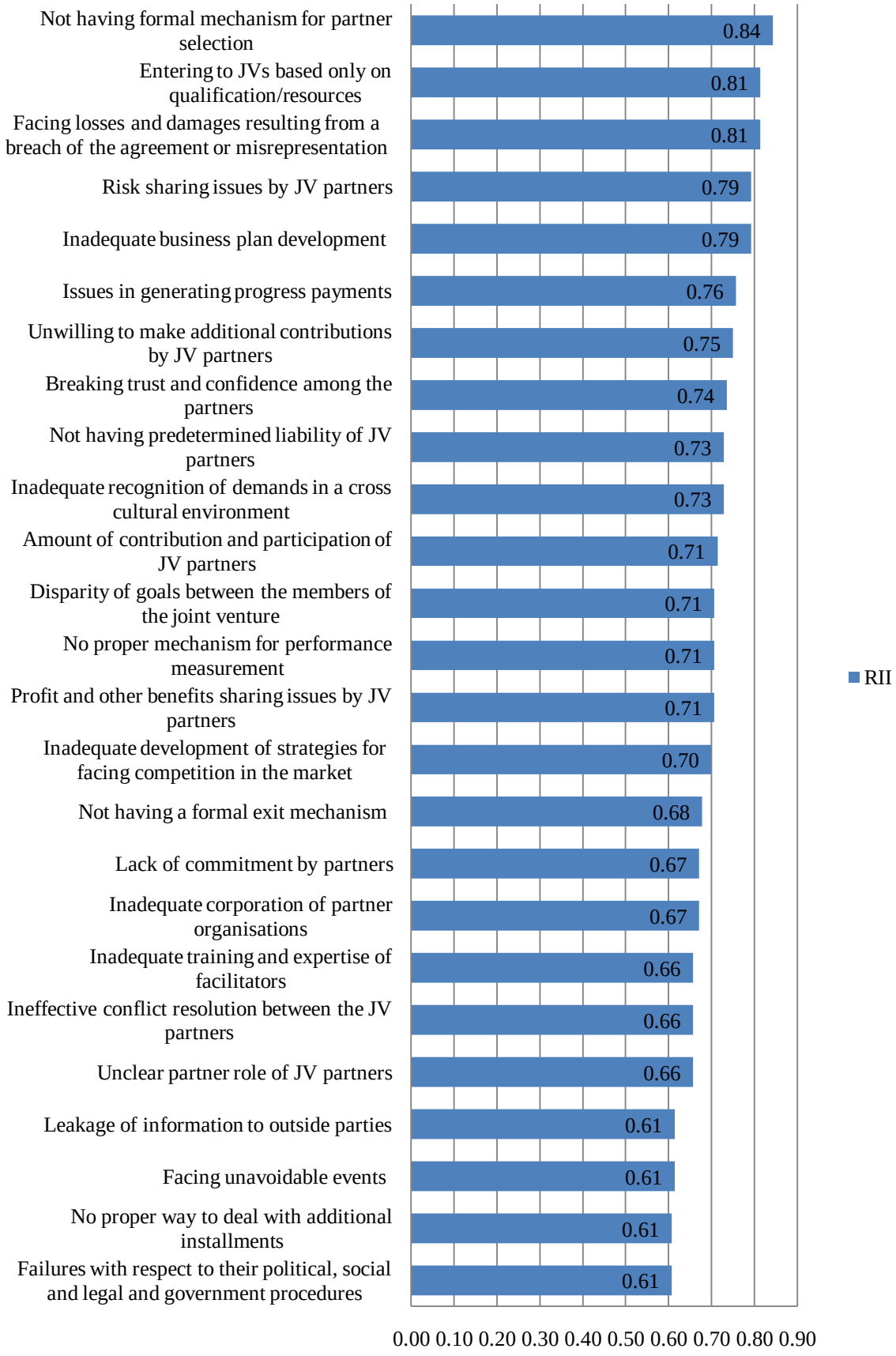

Figure 4.11: Relative importance matrix of the critical issues of CJVs

4.3.2 Stage 2 - Evaluation and validation of the critical issues in CJVs

The critical issues determined in data analysis stage one were used in second stage of data analysis to evaluate the data distribution of each factor.

4.3.2.1 Rankings of critical issues (data analysis - 2)

By considering the survey responses, first quartile (Q1), second quartile/ median (Q2), third quartile (Q3), 90^{th} percentile (90^{th} P), 10^{th} percentile (10^{th} P), maximum and minimum values of the data distribution of the critical issues in CJVs were calculated and ranked accordingly as shown in Table 4.10.

Table 44.10: Rankings of critical issues in CJVs (data analysis - 2)

Critical Issues	**Median**	**Q3**	**Q1**	**90th P**	**10th P**	**MAX**	**MIN**	**Rank**
Not having formal guideline for partner selection	5	5	4	5	2.7	5	1	1
Facing losses and damages resulting from a breach of the agreement or misrepresentation	4	5	4	5	3	5	2	2
Entering to JVs based only on qualification/resources	4	5	3.75	5	3	5	1	3
Inadequate business plan development	4	5	3.75	5	2.7	5	1	4
Risk sharing issues by JV partners	4	5	3	5	2	5	2	5
Inadequate recognition of demands in a cross cultural environment	4	5	3	5	2	5	1	6
Not having predetermined liability of JV partners	4	5	3	5	2	5	1	6
Profit and other benefits sharing issues by JV partners	4	5	2	5	2	5	1	8
Breaking trust and confidence among the partners	4	4.25	3	5	2	5	2	9
Issues in generating progress payments	4	4	3	5	3	5	2	10
No proper mechanism for performance measurement	4	4	3	5	2	5	1	11
Inadequate development of strategies for facing competition in the market	4	4	3	5	1.7	5	1	12
Unwilling to make additional contributions by JV partners	4	4	3	4.3	3	5	2	13
Disparity of goals between the members of the joint venture	4	4	3	4	2	5	2	14

Inadequate corporation of partner organisations	4	4	2	5	2	5	1	15
Amount of contribution and participation of JV partners	3.5	4	3	5	2	5	2	16
Not having a formal exit mechanism	3.5	4	3	4	2.7	4	2	17
Unclear partner role of JV partners	3	4.25	2	5	2	5	1	18
Lack of commitment by partners	3	4.25	2	5	2	5	1	18
Ineffective conflict resolution between the JV partners	3	4	2.75	5	2	5	2	20
Inadequate training and expertise of facilitators	3	4	2	5	2	5	2	21
Facing unavoidable events	3	4	2	5	2	5	2	21
Failures with respect to their political, social and legal and government procedures	3	4	2	5	2	5	1	23
Leakage of information to outside parties	3	4	2	5	2	5	1	23
No proper way to deal with additional installments	3	4	2	4	2	4	2	25

As per the results extracted from the data analysis - 2, the critical issues in CJVs were ranked. As results show that the factor of not having formal mechanism for partner selection obtained the first ranking while facing losses and damages resulting from a breach of the agreement or misrepresentation, entering to JVs based only on qualification/resources, inadequate business plan development and risk sharing issues by JV partners were obtained second, third, fourth and fifth rankings accordingly. The factors of inadequate recognition of demands in a cross cultural environment and not having predetermined liability of JV partners showed similar results; thus ranked as sixth. Among the other issues, inadequate training and expertise of facilitators, facing unavoidable events, failures with respect to their political, social and legal and government procedures, leakage of information to outside parties and no proper way to deal with additional installments were considered as least critical issues in CJVs.

As the next step, the critical issues which were evaluated in two stages of data analysis were compared identifying the similarities and differences of the rankings for further verification of the research findings.

The section 4.3.2.2 presents the comparison of the rankings of critical issues in two stages of data analysis.

4.3.2.2 Comparison of the rankings of critical issues

According to the comparison of analysis, several similarities and differences can be known among the ranking of critical issues of CJVs as shown in Table 4.11.

Table 4.11: Comparison of rankings

Critical Issues	**Ranking of factors**	
	Data analysis stage - 1	**Data analysis stage - 2**
Not having formal guideline for partner selection	1	1
Facing losses and damages resulting from a breach of the agreement or misrepresentation	2	2
Entering to JVs based only on qualification/resources	2	3
Inadequate business plan development	4	4
Risk sharing issues by JV partners	4	5
Issues in generating progress payments	6	10
Unwilling to make additional contributions by JV partners	7	13
Breaking trust and confidence among the partners	8	9
Inadequate recognition of demands in a cross cultural environment	9	6
Not having predetermined liability of JV partners	9	6
Amount of contribution and participation of JV partners	11	16
Profit and other benefits sharing issues by JV partners	12	8
No proper mechanism for performance measurement	12	11
Disparity of goals between the members of the joint venture	12	14
Inadequate development of strategies for facing competition in the market	15	12
Not having a formal exit mechanism	16	17
Inadequate corporation of partner	17	15

Critical Issues	Ranking of factors	
	Data analysis stage - 1	Data analysis stage - 2
organisations		
Lack of commitment by partners	17	18
Unclear partner role of JV partners	19	18
Ineffective conflict resolution between the JV partners	19	20
Inadequate training and expertise of facilitators	19	21
Facing unavoidable events	22	21
Leakage of information to outside parties	22	23
Failures with respect to their political, social and legal and government procedures	22	23
No proper way to deal with additional installments	22	25

Among the other factors, not having formal guideline for partner selection has obtained a similar ranking in two stages of analysis where it has recognized as the top ranked issue in CJVs in Sri Lanka. Further, facing losses and damages resulting from a breach of the agreement or misrepresentation has obtained the second ranking in two stages of data analysis. However, fewer differences can be found on the rankings of the factors of entering to JVs based only on qualification/resources, inadequate business plan development, risk sharing issues by JV partners, inadequate recognition of demands in a cross cultural environment, not having predetermined liability of JV partners, profit and other benefits sharing issues by JV partners, Breaking trust and confidence among the partners, issues in generating progress payments and no proper mechanism for performance measurement where they have laid within the range of the rankings of 2 to 12.

The factors of unclear partner role of JV partners, lack of commitment by partners, ineffective conflict resolution between the JV partners, inadequate training and expertise of facilitators, facing unavoidable events, failures with respect to their political, social and legal and government procedures, leakage of information to outside parties and no proper way to deal with additional installments were

determined as least critical factors where they laid within the range of the rankings of 18 to 25.

4.3.2.3 Visualization of data using box plots of critical issues

The box plot is used for plotting the continuous data relate to quantitative variables of critical issues of CJVs by comparing the distribution of the data across each factor. The box plots of each factor were drawn in parallel by calculating the first quartile, second quartile/ median (Q2) and third quartile (Q3) of the data distribution of the critical issues as shown in Figure 4.12. All the factors were lined up from lowest to largest rankings in the box plots chart where not having formal mechanism for partner selection and no proper way to deal with additional installments present first and last rankings in order. The box length gives an indication of the sample variability and the line across the box shows where the sample is centred.

As the major illustrations which can be presented through the box plots drawn, the score range, median and inter-quartile range (IQR) of the data distribution of each factor is calculated.

Box plot 1 - Not having formal guideline for partner selection

The box plot drawn for the factor of not having formal guideline for partner selection showed 2.3 score range where median is equal to 5. The IQR of the box plot is 1. The bottom 25% of the scores takes values from 2.7 up to, but less than 4. The top of 25% of the scores take values from, but not including, 5 up to 5. The middle 50% of the scores lie between 4 to 5. The median is equal to the upper quartile, so the scores are clustered closer to the median than the bottom half. Further, the box plot is comparatively short compared to the other factors, so it suggests that the overall respondents have a high level of agreement with each other over their responses.

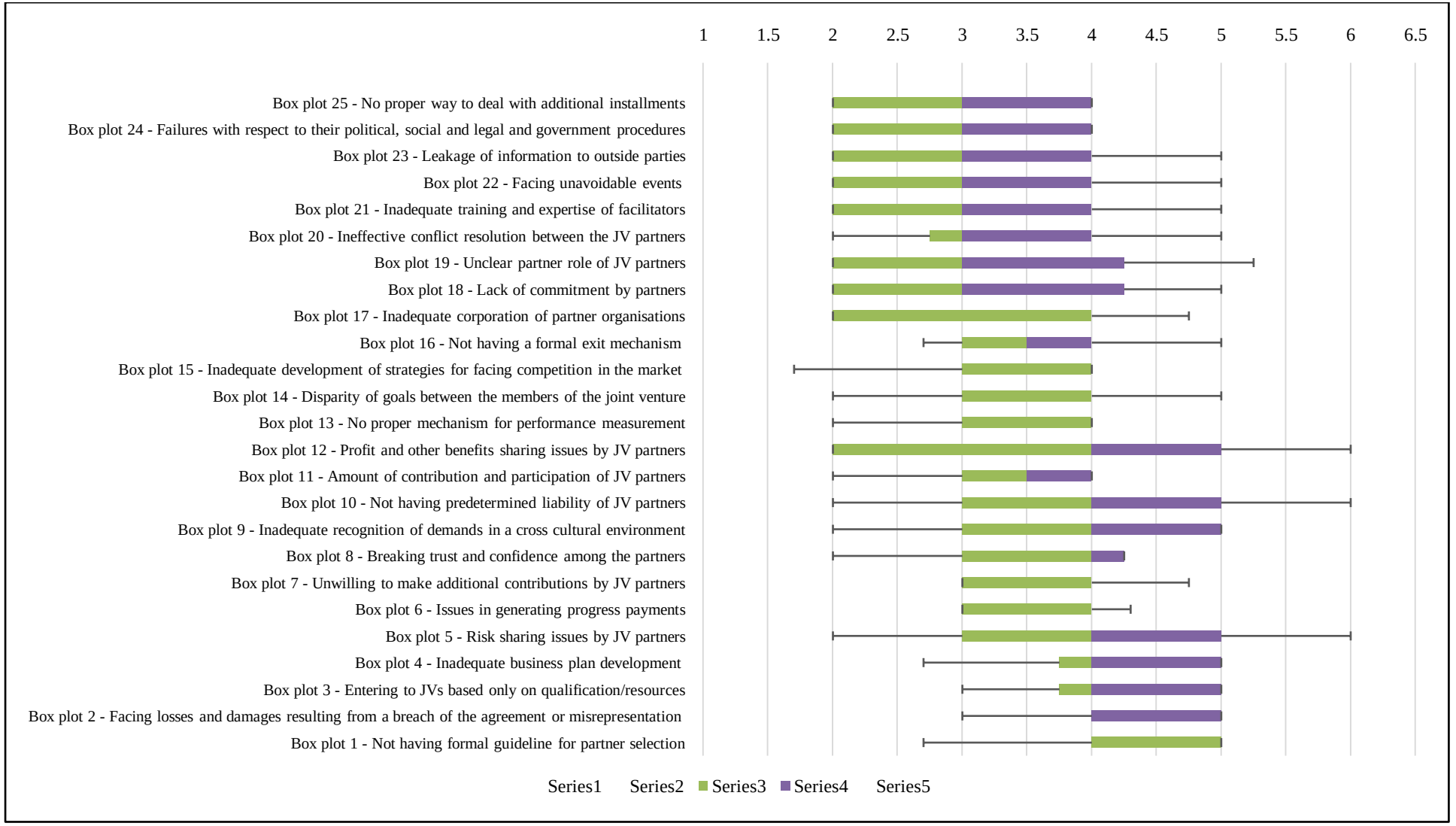

Figure 4.12: Box plots of critical issues

Box plot 2 - Facing losses and damages resulting from a breach of the agreement or misrepresentation

The score range for the box plot drawn for the factor of facing losses and damages resulting from a breach of the agreement or misrepresentation is 2 where the median is equal to 4. The IQR of the box plot is 1. The bottom 25% of the scores takes values from 3 up to, but less than 4. The top of 25% of the scores take values from, but not including, 5 up to 5. The middle 50% of the scores lies between 4 to 5. The median is equal to the lower quartile, so the scores are clustered closer to the median than the top half.

Box plot 3 - Entering to JVs based only on qualification/resources

The box plot drawn for the factor of entering to JVs based only on qualification/resources showed the range of score as 2 where the IQR equals to 1.25. The top of 25% of the scores take values from, but not including, 5 up to 5. The middle 50% of the scores lie between 3.75 to 5. The median has laid on 4 and it is closer to the lower quartile than the upper quartile. Further, the bottom whisker is much longer than the top whisker.

Box plot 4 - Inadequate business plan development

The box plot of this factor has the score range of 2.3. IQR equals to 1.25. The median laid up on 4 where it is closer to the lower quartile than the upper quartile. The bottom 25% of the scores takes values from 2.7 up to, but less than 3.75. The top of 25% of the scores take values from, but not including, 5 up to 5. The middle 50% of the scores lie between 4 to 5.

Box plot 5 - Risk sharing issues by JV partners

The range of score of the box plot of risk sharing issues by JV partners equals to 3. The box plot is laid between 5 and 3 of upper and lower quartiles thus IQR equals to 2. The median of the box plot is 4. The median is laid at the middle of lower and upper quartiles. The bottom 25% of the scores takes values from 2 up to, but less than 3. The top of 25% of the scores take values from, but not including, 5 up to 5. The middle 50% of the scores lie between 3 to 5.

Box plot 6 - Issues in generating progress payments

The score range calculated for the box plot of the factor of issues in generating progress payments is 2 where IQR equals to 1. As it appears, the bottom 25% of the scores takes values from 3 up to, but less than 3. The top of 25% of the scores take values from 3 up to

4, but not including 4 up to 5. The middle 50% of the scores laid between 3 to 4. However, the median is laid on the value of 4 and it equals to the upper quartile of the data distribution.

Box plot 7 - Unwilling to make additional contributions by JV partners

The score range calculated for the box plot of the factor of unwilling to make additional contributions by JV partners is 1.3. The box is plotted between the lower and upper quartile ranges of 3 to 4. Thus, the IQR equals to 1. Hence, the bottom 25% of the scores takes values from 3 up to, but less than 3. The top of 25% of the scores take values from, but not including 4 up to 4.3. The middle 50% of the scores laid between 3 to 4. Further, the median of the box plot (median= 4) equals to the upper quartile of the data distribution.

Box plot 8- Breaking trust and confidence among the partners

The box plot which is drawn for the factor of breaking trust and confidence among the partners is laid between the lower and upper quartile rages of 3 to 4.25. However, the range of score lies between the lower and higher score of 2 to 5. Hence, the range of score equals to 3.2 where IQR of the box plot is 1.25. The bottom 25% of the scores takes values from 2 up to, but less than 3. The top of 25% of the scores take values from, but not including 4.25 up to 5. The middle 50% of the scores is laid between 3 to 4.25. The median of the box plot is 4 where it is closer to the upper quartile, so the scores are clustered closer to the median than the bottom half.

Box plot 9 - Inadequate recognition of demands in a cross cultural environment

The box plot drawn for the factor of an inadequate recognition of demands in a cross cultural environment is laid on the score range of 3. The lower and upper quartile ranges are from 5 to 3; thus the IQR equals to 2. As the box plot appears, the bottom 25% of the scores takes values from 2 up to, but less than 3. The top of 25% of the scores take values up to 5. The middle 50% of the scores is laid between 3 to 5. Further, the median of the box plot is 4 where it locates at the middle of lower and upper quartile ranges of the data distribution.

Box plot 10 - Not having predetermined liability of JV partners

The range of score calculated for the box plot of the factor of not having predetermined liability of JV partners is 3 where it lies between the lower and upper scores of 2 to 5. The

box is plotted between lower and upper quartile values of 3 and 5; thus IQR equals to 2. Hence, the bottom 25% of the scores takes values from 2 up to, but less than 3. The top of 25% of the scores take values up to 5. The middle 50% of the scores is laid between 3 to 5. Same as the previous factor, the median of the box plot is 4 where it locates at the middle of lower and upper quartile ranges of the data distribution.

Box plot 11 - Amount of contribution and participation of JV partners

The box plot of the factor of amount of contribution and participation of JV partners is appeared within the score rage of 3. The IQR equals to 1 with the lower and upper quartiles of 3 and 4. Thus, the bottom 25% of the scores takes values from 2 up to, but less than 3. The top of 25% of the scores take values from, not including 4 up to 5. The middle 50% of the scores is laid between 3 to 4. The median of 3.5 is closer to the lower quartile; so the scores are clustered closer to the median than the top half.

Box plot 12 - Profit and other benefits sharing issues by JV partners

Based on the calculations, the box plot for the factor of profit and other benefits sharing issues by JV partners was drawn. The score range of the box plot is 3. The lower and upper quartiles are equivalent to 2 and 5 respectively. Hence, the IQR of the box plot is 3. As it appears, the bottom 25% of the scores takes values from 2 up to, but less than 3. The top of 25% of the scores take values up to 5. The middle 50% of the scores is laid between 2 to 5. The median of 4 is so closer to the upper quartile of the data distribution than the lower. Therefore, the scores are clustered closer to the median than the bottom half of the plot.

Box plot 13 - No proper mechanism for performance measurement

The box plot of the factor of no proper mechanism for performance measurement is plotted within the lower and higher scores of 21 to 5; thus the range of score equals to 3. The IQR of the box plot is 1 with the lower and upper quartile values of 3 and 4. In the box plot, the bottom 25% of the scores takes values from 2 up to, but less than 3. The top of 25% of the scores take values from, not including 4 up to 5. The middle 50% of the scores is laid between 3 to 4. The median of the box plot is 4 and it equals to the upper quartile of the data distribution.

Box plot 14 - Disparity of goals between the members of the joint venture

The range of score calculated for the box plot of the factor of disparity of goals between the members of the joint venture is 2. IQR of the box plot is 1 whereas lower and upper quartiles are identical as 3 and 4. The bottom 25% of the scores takes values from 2 up to, but less than 3. The top of 25% of the scores take values up to 4. The middle 50% of the scores is laid between 3 to 4. The median of the box plot is 4 and it equals to the upper quartile of the data distribution same as the previous factor.

Box plot 15 - Inadequate development of strategies for facing competition in the market

The box plot of an inadequate development of strategies for facing competition in the market is laid within the score range of 3.3 with the low and high score values of 1.7 and 5 respectively. The IQR calculated for the box plot is 1 (Q3=4; Q1=3). Hence, the bottom 25% of the scores takes values from 1.7 up to, but less than 3. The top of 25% of the scores take values from, not including 4 up to 5. The middle 50% of the scores is laid between 3 to 4. Further, the median of the box plot is 4 which equals to the upper quartile of the data distribution.

Box plot 16 - Not having a formal exit mechanism

The range of score calculated for the box plot of the factor of not having a formal exit mechanism is 1.3 with the low and high score values of 2.7 and 4 in order. The lower and upper quartiles of the box plot are 3 and 4; thus IQR equals to 1. The bottom 25% of the scores takes values from 2.7 up to, but less than 3. The top of 25% of the scores take values up to 4. The middle 50% of the scores is laid between 3 to 4. The median value of the box plot is 3.5 which is so closer to the lower quartile, so the scores are clustered closer to the median than the top half of the plot.

Box plot 17 - Inadequate corporation of partner organisations

Based on the calculations, the box plot for the factor of inadequate corporation of partner organisations was drawn. The score range of the box plot is 3. The lower and upper quartiles are equivalent to 2 and 4 respectively. Hence, the IQR of the box plot is 2. In the range, the bottom 25% of the scores takes values up to 2. The top of 25% of the scores take values from, not including 4 up to 5. The middle 50% of the scores is laid between 2 to 4.

The median of the box plot is 4 where it is equal to the upper quartile of the data distribution.

Box plot 18 – Lack of commitment by partners

The box plot drawn for the factor of lack of commitment by partners is laid between the score range of 3. The IQR of the box plot is 2.25 with the lower and upper quartile values of 2 and 4.25. Hence in the score range, the bottom 25% of the scores takes values up to 2. The top of 25% of the scores take values from, not including 4.25 up to 5. The middle 50% of the scores is laid between 2 to 4.25. The median value of the box plot equals to 3where it is closer to the lower quartile of the data distribution, the scores are clustered closer to the median than the top half of the plot.

Box plot 19 - Unclear partner role of JV partners

The score range of the box plot of unclear partner role of JV partners equals to 3 with the lower and higher score values of 2 and 5 respectively. The IQR of the box plot is 2.25 where lower and upper quartiles are equal to 2 and 4.25. Same as the previous factor of lack of commitment by partners, this box plot show the same results where the bottom 25% of the scores takes values up to 2. The top of 25% of the scores take values from, not including 4.25 up to 5. The middle 50% of the scores is laid between 2 to 4.25. Similarly, the median value of the box plot equals to 3where it is closer to the lower quartile of the data distribution.

Box plot 20 - Ineffective conflict resolution between the JV partners

The box plot of an inadequate development of strategies for facing competition in the market is laid within the score range of 3 with the low and high score values of 2 and 5 respectively. The IQR calculated for the box plot is 1.25 (Q3=4; Q1=2.75). Hence, the bottom 25% of the scores takes values from 2 up to, but less than 2. The top of 25% of the scores take values from, not including 4 up to 5. The middle 50% of the scores is laid between 2.75 to 4. Further, the median of the box plot is 3 which is closer to the lower quartile than the upper quartile of the data distribution.

Box plot 21 - Inadequate training and expertise of facilitators

The score range of the box plot of the factor of an inadequate training and expertise of facilitators is 3 with the lower and higher scores of 2 and 5. Further, IQR can be calculated

as 2 whereas the lower and upper quartile values equal to 2 and 4 respectively. The bottom 25% of the scores takes values up to 2. The top of 25% of the scores take values from, not including 4 up to 5. The middle 50% of the scores is laid between 2 to 4. In the box plot drawn, the median is laid on the value of 3 where it has located at the middle of the lower and upper quartile of the data distribution.

Box plot 22 - Facing unavoidable events

As per the calculations, the box plot of the factor of facing unavoidable events was drawn within the score range of 3 (higher score=5; lower score=2). The IQR of the box plot is 2 with the lower and upper quartile values of 2 and 4. Hence, the bottom 25% of the scores takes values up to 2. The top of 25% of the scores take values from, not including 4 up to 5. The middle 50% of the scores is laid between 2 to 4. The median of the box plot is 3. It has located at the middle of the lower and upper quartile of the data distribution.

Box plot 23 - Leakage of information to outside parties

Similar to the factor of facing unavoidable events, the box plot of the leakage of information to outside parties also plotted within the same score range of 3. The IQR is 2 with the lower and upper quartile values of 2 and 4. Hence, the bottom 25% of the scores takes values up to 2. The top of 25% of the scores take values from, not including 4 up to 5. The middle 50% of the scores is laid between 2 to 4. The median of the box plot equals to 3 which has located at the middle of the lower and upper quartile of the data distribution.

Box plot 24 – Failures with respect to their political, social and legal and government procedures

The box plot of the failures with respect to their political, social and legal and government procedures is laid within the score range of 3 (higher score=5; lower score=2). The IQR of the box plot equals to 2 where the lower and upper quartile values are of 2 and 4. Hence, the bottom 25% of the scores takes values up to 2. the top of 25% of the scores take values from, not including 4 up to 5. The middle 50% of the scores is laid between 2 to 4. The median of the box plot equals to 3 which has located at the middle of the lower and upper quartile of the data distribution.

Box plot 25 - No proper way to deal with additional installments

The score range of the box plot of the factor of no proper way to deal with additional installments equals to 2, as the lower and higher scores are equal to 2 and 4. The IQR is calculated as 2 where the lower and upper quartile values equal to 2 and 4 respectively. Hence, the bottom 25% of the scores takes values up to 2. The top of 25% of the scores take values up to 4. The middle 50% of the scores is laid between 2 to 4. The median of the box plot equals to 3 where it located at the middle of the lower and upper quartile of the data distribution. The score rage, median and inter-quartile range of the data distribution of each factor is summarised in Table 4.12.

Table 4.12: Basic representations of the box plots drawn

Critical Issues	Range of score			IQR			Median
	High	low	Range	Q3	Q1	IQR	
Not having formal guideline for partner selection	5	2.7	2.3	5	4	1	5
Facing losses and damages resulting from a breach of the agreement or misrepresentation	5	3	2	5	5	0	4
Entering to JVs based only on qualification/resources	5	3	2	5	3.75	1.25	4
Inadequate business plan development	5	2.7	2.3	5	3.75	1.25	4
Risk sharing issues by JV partners	5	2	3	5	3	2	4
Issues in generating progress payments	5	3	2	4	3	1	4
Unwilling to make additional contributions by JV partners	4.3	3	1.3	4	3	1	4
Breaking trust and confidence among the partners	5	2	3	4.25	3	1.25	4
Inadequate recognition of demands in a cross cultural environment	5	2	3	5	3	2	4
Not having predetermined liability of JV partners	5	2	3	5	3	2	4
Amount of contribution and participation of JV partners	5	2	3	4	3	1	3.5
Profit and other benefits sharing issues by JV partners	5	2	3	5	2	3	4

Critical Issues	Range of score			IQR			Median
	High	low	Range	Q3	Q1	IQR	
No proper mechanism for performance measurement	5	2	3	4	3	1	4
Disparity of goals between the members of the joint venture	4	2	2	4	3	1	4
Inadequate development of strategies for facing competition in the market	5	1.7	3.3	4	3	1	4
Not having a formal exit mechanism	4	2.7	1.3	4	3	1	3.5
Inadequate corporation of partner organisations	5	2	3	4	2	2	4
Lack of commitment by partners	5	2	3	4.25	2	2.25	3
Unclear partner role of JV partners	5	2	3	4.25	2	2.25	3
Ineffective conflict resolution between the JV partners	5	2	3	4	2.75	1.25	3
Inadequate training and expertise of facilitators	5	2	3	4	2	2	3
Facing unavoidable events	5	2	3	4	2	2	3
Leakage of information to outside parties	5	2	3	4	2	2	3
Failures with respect to their political, social and legal and government procedures	5	2	3	4	2	2	3
No proper way to deal with additional installments	4	2	2	4	2	2	3

4.3.2.3 Comparison of the parallel box plots of critical issues in CJVs

The box plot drawn for each factor was considered and compared to validate the critical issues determined in data analysis. In comparison of such parallel box plots, the box plots drawn for the factors of not having formal guideline for partner selection, facing losses and damages resulting from a breach of the agreement or misrepresentation, issues in generating progress payments, unwilling to make additional contributions by JV partners, amount of contribution and participation of JV partners, no proper mechanism for performance measurement, disparity of goals between the members of the joint venture, inadequate development of strategies for facing competition in the market and not having a formal exit mechanism were comparatively short and the IQR equals to 1. Hence, it

suggests that overall respondents have a high level of agreement with each other about the selection of those factors as critical issues of CJVs.

Most importantly, the first ranked critical issue of not having formal guideline for partner selection showed a high level of agreement over the majority of response of survey respondents. However, the box plot of the profit and other benefits sharing issues by JV partners has plotted within a larger IQR of 3 compared to other factors. This suggests that the respondents hold quite different opinions about this factor even though it has been selected as a critical issue of CJVs in Sri Lanka with the ranking of 12.

On the other hand, the box plots drawn for the factors of facing losses and damages resulting from a breach of the agreement or misrepresentation, entering to JVs based only on qualification/resources, inadequate business plan development, risk sharing issues by JV partners, issues in generating progress payments, unwilling to make additional contributions by JV partners, breaking trust and confidence among the partners, inadequate recognition of demands in a cross cultural environment, not having predetermined liability of JV partners, profit and other benefits sharing issues by JV partners, no proper mechanism for performance measurement, disparity of goals between the members of the joint venture, inadequate development of strategies for facing competition in the market and inadequate corporation of partner organizations showed same median of 4 where the data distribution is different. Similarly, the median of the box plots of the factors including the lack of commitment by partners, unclear partner role of JV partners, ineffective conflict resolution between the JV partners, inadequate training and expertise of facilitators, facing unavoidable events, leakage of information to outside parties, failures with respect to their political, social and legal and government procedures and no proper way to deal with additional installments are all at the same level (Median=3) with different distributions. Thus, all those factors showed very different distributions of views of the respondents even though the medians are all at the same levels.

Hence, the box plots drawn give a way for further clarifying the survey responses over the critical issues determined in this research. While the critical issues of CJVs are evaluated and validated in this regard, the strategies to overcome the aforementioned issues are described subsequently.

4.3.3 Proposed strategies to overcome the critical issues in CJVs

The selected experts in the main survey were asked to propose strategies to overcome the issues of construction joint ventures in Sri Lanka. By considering the strategies proposed by respondents through the questionnaire survey and by selected experts through semi-structured interviews, followings were recognized to overcome the critical issues of CJVs. The strategies which were proposed to overcome the critical issues in CJVs in Sri Lanka are presented in Table 4.13.

As most of the respondents highlighted, not having proper formal guideline to initiate local CJVs is a main loophole. Thus, out of 28 respondents, 19 (67%) were agreed that the government can instigate a national mechanism to govern the local CJVs throughout its whole process. Further, as they further mentioned, having a national regulatory body for CJVs can also be introduced. Further, most of the respondents stated that the right choice of partner is crucial importance for the success of CJVs unless otherwise it could lead to several issues in CJVs. Hence, all respondents were envisaged that by introducing formal partner selection criteria for CJVs could fewer the partner selection related issues. Indeed, as most of the respondents argued, the JV agreement should also be formalized by adding all required provisions to overcome the issues that may arise in the future. As an example, the Project Manager stated that *"We have faced lots of issues without having pre-determined provisions in JV agreement when dealing with our JV partners. Some of them were really critical to handle."* Thus, adding provisions in JV agreement relating to capitalization, material inputs and manpower allocation for the project will be important. Nevertheless, JV agreement should consists with adequate coverage for all potential liabilities, such as workers' compensation, general liability, vehicles and equipment and errors and omissions etc. Fifteen (15) respondents (53%) were agreed on that where more that 70 of total respondents were agreed up on providing specific provisions to address broader risk management issues of contract administration and signing authority, defining the preferred method for insuring the risks of JVs can be used to overcome the risk allocation related issues of CJVs in Sri Lanka. Indeed, the financial issues of CJVs can be overcome by outlining how and when profits and losses will be allocated in the agreement and by providing provisions in JV agreement relates to internal billing practices. It is further proved by the Senior Quantity Surveyor as "*In any project we have to dealing with money. Especially in CJVs, we have to handle lots of financial issues when dealing with*

our JV partners. When adding direct and indirect cost of the project into project account, several issues can be generated for JV partners."

As respondents highlighted, clearly determined roles and responsibilities of JV partners is mostly important to overcome the issues of CJVs. Thus, specifying roles and responsibilities of JV partners for particular aspects of the project, having a clearly defined responsibility for critical management functions of project management, procurement of materials and supplies, subcontractor management and safety etc and introducing indemnity provisions that limit each party's liability exposure to its respective percentage of ownership were proposed as most suitable strategies to overcome the identified issues. Further, most of them were also agreed upon selecting a suitable dispute resolution procedure that could eliminate the conflicts between the JV partners.

Table 4.13 consists of the critical issues of CJVs related to the predetermined categories and the proposed strategies to overcome those identified issues of CJVs in Sri Lanka. The evaluation of issues of CJVs and the proposed strategies can be used by industry practitioners as a basis to evaluate the current status of CJV projects in order to initiate the successful CJVs in Sri Lanka.

Table 4.13: Proposed strategies

Category	Critical Issues	Proposed Strategies
Strategic management	▪ Entering to JVs based only on qualification/resources ▪ Inadequate business plan development ▪ Disparity of goals between the members of the joint venture ▪ Inadequate development of strategies for facing competition in the market ▪ Failures with respect to their political, social and legal and government procedures	▪ A national guideline to govern the local CJVs ▪ a national regulatory body for CJVs ▪ Providing provisions of the contract (relating to capitalization, material inputs and manpower, etc as specific on the time periods ▪ Attempts to draw up fully comprehensive legal agreements between partners
Partner selection	▪ Not having formal guideline for partner selection ▪ Amount of contribution and participation of JV partners ▪ Unclear partner role of JV partners ▪ Inadequate training and expertise of facilitators	▪ Introducing a formal partner selection criteria ▪ The agreement should also establish a process for eliminating voting rights of a defaulting JV member
Cultural issues	▪ Inadequate recognition of demands in a cross cultural environment ▪ Leakage of information to outside parties	▪ Introducing ways to developing trust in between JV partners. ▪ Introducing social and cultural gatherings to ensure satisfied and effective collaboration in between JV partners
Performance	▪ No proper mechanism for performance measurement	▪ Introducing national and institutional level performance measurement mechanism for whole process of CJVs.
Risk allocation	▪ Facing losses and damages resulting from a breach of the agreement or misrepresentation ▪ Risk sharing issues by JV partners ▪ Profit and other benefits sharing issues by JV partners ▪ Facing unavoidable events	▪ JV agreement with adequate coverage for all potential liabilities, such as workers' compensation, general liability, vehicles and equipment and errors and omissions etc ▪ Define the preferred method for insuring the risks of JVs ▪ Specific provisions to address broader risk management

Category	Critical Issues	Proposed Strategies
		issues of contract administration and signing authority
Financial issues	▪ Issues in generating progress payments ▪ Unwilling to make additional contributions by JV partners ▪ No proper way to deal with additional installments	▪ Outline how and when profits and losses will be allocated in the agreement ▪ Providing provisions in JV agreement relates to internal billing practices
Liability and indemnity	▪ Breaking trust and confidence among the partners ▪ Not having predetermined liability of JV partners ▪ Lack of commitment by partners ▪ Inadequate corporation of partner organisations	▪ Specifying roles and responsibilities of JV partners for particular aspects of the project ▪ Having a clearly defined responsibility for critical management functions of project management, procurement of materials and supplies, subcontractor management and safety etc ▪ Introducing indemnity provisions that limit each party's liability exposure to its respective percentage of ownership
Ending of CJVs	▪ Not having a formal exit mechanism ▪ Ineffective conflict resolution between the JV partners	▪ Agreed-upon dispute resolution procedure

4.4 Summary

This chapter is intended to presents the data analysis, results and discussion relate to the issues of CJVs in Sri Lanka. The data analysis was conducted in two stages. As the first stage, the critical issues were determined by calculating the MWR and RII. Accordingly, twenty five issues such as, not having formal guideline for partner selection, facing losses and damages resulting from a breach of the agreement or misrepresentation, entering to JVs based only on qualification/resources, inadequate business plan development and risk sharing issues by JV partners etc were determined as critical issues in CJVs in Sri Lanka. As the second stage of data analysis, the data were visualized by using box plot diagrams. Hence, box plots were drawn to each critical factor and the data distribution was further evaluated. According to the results, the first ranked factor of not having a formal guideline for partner selection was determined as most critical issues in CJVs with the high agreement of the survey respondents. The responses over the other critical issues were also recognised. Accordingly, probable strategies were proposed to overcome the critical issues of CJVs in Sri Lanka.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter focuses to discuss and summarise the key research findings in order to draw conclusions and recommendations. First, the conclusions on overall research problem are presented relate to each and every objective achieved. Subsequently, recommendations are provided based on the key findings of this research. Accordingly, the implications to knowledge and industry are also presented along with the research limitations and the recommendations for further research.

5.2 Aim and Objectives

Even though the formation of joint ventures has now emerging in practice by sharing knowledge, resources and technology required undertaking the complex projects, it can be failed due to various issues. With the importance of overcoming the issues in CJVs, the study was intended to find the issues which are critical in construction joint ventures in Sri Lanka. In order to achieve the aim, the concept of CJV was reviewed and the contractual procedures of CJVs which are applied nationally and internationally were identified by reviewing key literature as the first and second objectives. The third and fourth objectives were achieved respectively by determining the issues which are critical in CJVs in Sri Lanka. As the fifth objective, the probable strategies were proposed to overcome the critical issues in CJVs in Sri Lanka. Achieving the first, second, third, fourth and fifth objectives as described in section 5.3 have ensured the fulfillment of the aim of this research.

5.3 Key Research Findings

The key findings of the research are summarised under each and every objective achieved to draw final conclusions and recommendations.

Objective One - To review the concept of 'Joint Ventures' in construction

Joint venture (JV) formation between constructions companies has become one of the most commonly adopted methods in industry mainly due to the complexity of construction projects. Further, organizations in construction sector move more towards such joint entities to reduce the risk by sharing or transferring, exploring the wide markets and taking competitive advantage by forming joint ventures. According to literature findings, several

definitions can be found on the concept of joint venture. In review of that the joint venture can be defined as collaboration between different organisations enables them to compensate for gaps in their knowledge and capacity to provide goods or services. The concept of CJV can refer to the collaboration of at least two construction organisations with a view to accomplishing mutually-agreed-upon objectives, wherein they share project risks, knowledge and resources.

Joint ventures and subcontracting are two main corporations mean in construction industry. CJV is a different concept from subcontracting in construction industry in terms of its responsibility, risk control and management. Sub-contracting is a forming of contractual relationship between firms or contractor and consultant where it is managed or monitored by laws which are related to the contract. By considering the above, the concept of CJV can be referred as a collaboration of two or more construction organizations to allow greater ease of work towards achieving a common aim through the manipulation of appropriate resources.

Objective Two - To identify the contractual procedures which are applied nationally and internationally in construction joint ventures

Gaining complimentary skills or pool resources, obtaining pricing security, meeting prequalification requirements, risk sharing and accessing technology are some of major reasons of forming a construction joint venture. Further, CJVs are forming as a competitive strategy, as well as a way to transfer technology, political risks, commercial risks and a remedy for tax implications. Forming joint ventures has become most popular both in developed and developing countries such as Australia, Japan etc specially when undertaking the large-scale construction projects. Most important factors considered during formation of JVs include contract agreement, financial stability and commitment while key risks associated with JVs are cultural and social differences, delays in approvals and financial risks. CJVs can mainly be divided as local joint ventures and international joint ventures, consisting with local and multinational partners respectively. As a developing country, joint venture is becoming most popular method in Sri Lankan construction industry. Construction investment in Sri Lanka has followed the economic changes during the last decade and as a result the country has come up with large infrastructure and industrial developments projects however with the technological, managerial and financial deficiencies.

The process of establishing the JV can be considered as a project and will pass through several stages before completion and early stages in this process will be the identification of potential partners and negotiating the terms and condition of the Joint Venture. Hence, the life cycle of CJV may include exploratory stage, growth phase, stability phase and collapse.

The success or a high performance of construction joint ventures is necessary where major project partners could involved in to the joint venture with mutual understanding. Hence, careful selection of partner organizations is important for assuring the mutual bond for better performance of CJVs. Further, establishing certain strategies by joint venture partners has become important to enhance the performance of construction joint ventures. Specially, the preparation of correct and effective joint venture agreement has become crucial. As existing literature proved, there is no standard strategy to adopt construction joint ventures in most of the developing countries. Similarly in Sri Lanka, there is no any guideline to follow in local context, thus, JV agreements are institutionally developed by local construction contractors by identifying their own requirements; thus various issues between both parties in executing the large construction projects can be found.

Objective Three - To identify the issues of construction joint ventures

Construction joint ventures can have high failure rate mainly due its issues. According to key literature, thirty six (36) issues and related effects were identified relate to the categories of strategic management, partner selection, cultural issues, performance measurement, risk allocation, ending of JV, financial issues and liability and indemnity.

The factors of wrong choice of type of JV, incompatibility of project objectives, disparity of goals between the members of the joint venture, inadequate business plan development , lack of commitment of top management, inadequate development of strategies for market, failures with respect to their political, social and legal and government procedures were identified as strategic management related issues while not having formal guideline for partner selection, unclear partner role of JV partners, amount of contribution and participation of JV partners, unequal negotiating power of project partners, inadequate staff training and misunderstanding of partnering concept were defined as partner selection related issues. Further, the category of cultural issues includes the differing perceptions of reality between the channel members, hasty associations of partners, inadequate recognition of demands in a cross cultural environment and leakage of information to

outside parties. The category of performance measurement consists of two factors such as disagreements on the definition and the measure of performance and no proper mechanism for performance measurement while risk allocation category includes risk sharing issues by JV partners, profit and other benefits sharing issues by JV partners, facing losses and damages resulting from a breach of the agreement or misrepresentation and facing unavoidable events. The issues relate to ending of JV include ineffective conflict resolution between the JV partners and not having a formal exit mechanism. The category of financial issues consists of the factors of issues in generating progress payments, no proper way to deal with additional installments, unwilling to make additional contributions by JV partners and accounting and auditing issues while the category of liability and indemnity includes not having predetermined liability of JV partners, incompatibility between interpersonal relationships, breaking trust and confidence among the partners, lack of commitment by partners, differences in management styles and organization culture and inadequate corporation of partner organisations. The identified issues were evaluated in order to determine the issues which are critical in CJVs in Sri Lanka.

Objective Four - To determine the issues which are critical in construction joint venture in Sri Lanka

The result can be summarized under two stages of data analysis where it was done to determine the critical issues in CJVs and for its further validation. As key research findings derived through data analysis stage one, twenty five (25) critical issues of CJVs were determined which showed MWR and RII values above the norm considered (MWR>3.0, RII>0.6) in analysis. Among them, not having formal guideline for partner selection and entering to JVs based only on qualification/resources were identified as top ranking factors with first and second rankings in order. Facing unavoidable events, leakage of information to outside parties and failures with respect to their political, social, legal and government procedures and no proper way to deal with additional installments were ranked as least critical issues in CJVs in Sri Lanka.

In the second stage of data analysis, the data distribution of critical issues were further evaluated and visualized through box plots to determine the majority response over each factor for further verification. According to the comparison of data analysis, several similarities and differences were known among the ranking of critical issues in CJVs. Among the other factors, not having formal guideline for partner selection obtained a

similar ranking (Ranking = 1) in two stages of analysis where it has recognised as the top ranking issue in CJVs in Sri Lanka.

The factors of not having a formal guideline for partner selection, facing losses and damages resulting from a breach of the agreement or misrepresentation, issues in generating progress payments, unwilling to make additional contributions by JV partners, amount of contribution and participation of JV partners, no proper mechanism for performance measurement, disparity of goals between the members of the joint venture, inadequate development of strategies for facing competition in the market and not having a formal exit mechanism showed a high level of agreement among the survey respondents about the selection of those factors as critical issues in CJVs. Most importantly, the first ranked critical issue of not having formal guideline for partner selection showed a high level of agreement over the majority of response of survey respondents; thus verified.

Objective Five - To propose probable strategies to overcome the critical issues in construction joint ventures in Sri Lanka

As the final objective of the research, the probable strategies were proposed to overcome the critical issues in CJVs in Sri Lanka. By considering the strategies proposed by respondents through the questionnaire survey and by selected experts through semi-structured interviews, various strategies were proposed.

Introducing a national guideline to govern the local CJVs, forming a national regulatory body for CJVs, providing provisions of the contract (relating to capitalization, material inputs and manpower, etc as specific on the time periods and attempts to draw up fully comprehensive legal agreements between partners were some of strategies which were proposed to overcome the critical issues in CJVs under strategic management.

Indeed, introducing formal partner selection criteria and establishing a process for eliminating voting rights of a defaulting JV member are the key attributes to overcome the top ranked issues in CJVs of not having a formal guideline for partner selection. Further, introducing ways to developing trust in between JV partners, introducing social and cultural gatherings to ensure satisfied and effective collaboration in between JV partners, introducing national and institutional level performance measurement mechanism for whole process of CJVs, define the preferred method for insuring the risks of JVs, specific provisions to address broader risk management issues, providing provisions in JV

agreement relates to internal billing practices, specifying roles and responsibilities of JV partners for particular aspects of the project, introducing indemnity provisions and agreed-upon dispute resolution procedure are the other strategies proposed to overcome the critical issues in CJVs in Sri Lanka.

Accordingly, the achievement of the first, second, third, fourth and fifth objectives have ensured the accomplishment of the prime aim of this research.

5.4 Contribution to Knowledge and Industry

Considering the findings of the research, following attributes can be recommended as implications to the knowledge and to the construction industry.

5.4.1 Contribution to knowledge

This research contributes to the knowledge by identifying the critical issues in CJVs as a major implication of this research. Besides, most of previous studies have focused on individual factors; this study was focused to create a broader picture about the issues existed in CJVs.

5.4.2 Contribution to construction industry

Forming CJVs has become a most popular method in Sri Lankan construction industry, especially when dealing with complex projects. However, the construction investment in complex constructions projects through CJVs has been hindered due to various issues faced by the project participants. Hence, the evaluation of issues in CJVs and the proposed strategies can be used by industry practitioners as a basis to evaluate the current status of CJV projects in order to initiate the successful CJVs in Sri Lanka.

Specially, introducing a national guideline to govern the local CJVs, forming a national regulatory body for CJVs and introducing formal partner selection criteria are the major attributes that the industry can initiate to ensure a successful formation and operation of CJVs in Sri Lanka.

5.5 Limitations of the Research

The research was focused only on determining the issues which are critical in CJVs. Among the different classification of joint ventures, construction joint ventures were considered in this research. By considering the different form of construction joint

ventures, the research was limited to local joint ventures. The data collection was limited to the CJVs in Sri Lankan context. Hence, the target population was limited to the prominent professionals who are engaged in CJVs in Sri Lanka.

Further, the genaralisability of the survey was limited to a random sample of forty (40) construction professionals who are currently working under CJVs in construction organizations in Sri Lanka. Thus, the research findings can be genaralised to the aforesaid population with confidence.

5.6 Recommendations for Further Research

- This research was intended to determine the critical issues in CJVs in Sri Lanka through descriptive statistical analysis and related rankings. Further study can be focused on evaluating and modeling the relation and the influence of critical issues on CJVs.
- An in-depth investigation can be done on CJVs in Sri Lanka in order to investigate the extant of procedures and issues in broader term. The different views of project participants can be qualitatively analysed in order to develop a best practice guideline for CJVs in Sri Lanka.
- This research was limited to local CJVs; thus a new study can be conducted on evaluating the enablers and barriers of forming international CJVs.

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APPENDICES

Appendix 3.1: The questionnaire developed and a sample filled

Appendix 4.1: The detailed table of calculations

Appendix 3.1: The questionnaire developed and a sample filled

Chamara H.W.L.
Department of Building Economics
Faculty of Architecture
University of Moratuwa.

Dear Sir / Madam,

Re: Research Dissertation – M.Sc. /PG Diploma in Construction Law and Dispute Resolution

I am a B.Sc. (Hons) Quantity Surveying graduate of Department of Building Economics, University of Moratuwa and currently working on the above degree. In fulfillment of this degree program, I am required to conduct a research and produce a dissertation.

Research Topic:

A Study on the Issues of Construction Joint Ventures in Sri Lanka

Purpose of the Research:

Aim

Aim of this research is to determine the issues which are critical for the construction joint venture failure failures in Sri Lanka.

Objectives

I. To review the concept of 'Joint Ventures' in construction
II. To identify contractual procedures which are applied nationally and internationally in construction joint ventures
III. To identify the issues of construction joint ventures
IV. To determine the issues which are critical for construction joint ventures in Sri Lanka
V. To propose probable attributes to overcome critical issues of construction joint ventures in Sri Lanka

I would be grateful if you could complete this questionnaire within your busy work schedule. The information gathered through this survey will be only used for this particular research.

Thank you.

Yours Faithfully,

Postgraduate Student

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The Questionnaire on

The Issues which are Critical for Construction Joint Venture Failures in Sri Lanka

General Information

Organization:

Designation of the Respondent:

Working Experience (Years):

Section A: The Current Practice of CJVs

1) What are the standard documents used/followed in your organisation for forming and operating construction joint ventures?

   ……

   ……

2) Please rate the level of use of CJVs in the current practice.

1	2	3	4	5
Never	**Low**	**Sometimes**	**Often**	**Always**

Section B: Level of Influence of Issues in CJVs

Please score the issues based on its level of influence on CJV failure byusing a '√' by considering the criteria given.

	Level of Influence				
	Much Lower	**Slightly Lower**	**Normal**	**Slightly Higher**	**Much Higher**
	1	**2**	**3**	**4**	**5**
Strategic Management					
Entering to JVs based only on qualification/resources					
Incompatibility of project objectives					
Disparity of goals between the members of the joint venture					
Inadequate business plan development					
Lack of commitment of top management					
Inadequate development of strategies for facing competition in the market					

Failures with respect to their political, social and legal and government procedures					
Partner Selection					
Not having formal guideline for partner selection					
Unclear partner role of JV partners					
Amount of contribution and participation of JV partners					
Unequal negotiating power of project partners					
Inadequate training and expertise of facilitators					
Unfamiliarity and misunderstanding of partnering concept by project participants					
Cultural Issues					
Differing perceptions of reality between the channel members					
Hasty associations of partners					
Inadequate recognition of demands in a cross cultural environment					
Leakage of information to outside parties					
Performance					
Disagreements on the definition and the measure of performance					
No proper mechanism for performance measurement					
Risk Allocation					
Risk sharing issues by JV partners					
Profit and other benefits sharing issues by JV partners					
Facing losses and damages resulting from a breach of the agreement or misrepresentation					

Facing unavoidable events					
Financial Issues					
Issues in generating progress payments					
No proper way to deal with additional installments					
Unwilling to make additional contributions by JV partners					
Accounting and auditing related issues					
Issues in generating progress payments					
Liability and Indemnity					
Not having predetermined liability of JV partners					
Incompatibility between interpersonal relationships					
Breaking trust and confidence among the partners					
Lack of commitment by partners					
Differences in management styles and organization culture					
Inadequate corporation of partner organisations					
Ending of JV					
Not having a formal exit mechanism					
Ineffective conflict resolution between the JV partners					

3) What are your suggestions to overcome the issues of CJVs?

……

……

……

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……

……Thank You…….

Chamara H.W.L.
Department of Building Economics
Faculty of Architecture
University of Moratuwa.

Dear Sir / Madam,

Re: Research Dissertation – M.Sc. /PG Diploma in Construction Law and Dispute Resolution

I am a B.Sc. (Hons) Quantity Surveying graduate of Department of Building Economics, University of Moratuwa and currently working on the above degree. In fulfillment of this degree program, I am required to conduct a research and produce a dissertation.

Research Topic:

A Study on the Issues of Construction Joint Ventures in Sri Lanka

Purpose of the Research:

Aim

Aim of this research is to determine the issues which are critical for the construction joint ventures in Sri Lanka.

Objectives

VI. To review the concept 'Joint Ventures' in construction
VII. To identify contractual procedures which are applied nationally and internationally in construction joint ventures
VIII. To identify the issues of construction joint ventures
IX. To determine the issues which are critical for construction joint ventures in Sri Lanka
X. To propose probable attributes to overcome the critical issues of construction joint ventures in Sri Lanka

I would be grateful if you could complete this questionnaire within your busy work schedule. The information gathered through this survey will be only used for this particular research.

Thank you.

Yours Faithfully,

Postgraduate Student

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Dissertation Supervisor

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The Questionnaire on

The Issues which are Critical for Construction Joint Ventures in Sri Lanka

General Information

Organization:

Designation of the Respondent:

Working Experience (Years):

Section A: The Current Practice of CJVs

4) What are the standard documents used/followed in your organisation for forming and operating construction joint ventures?
   No any standard document to refer. We are following our own requirements when entering to CJVs.

5) Please rate the level of use of CJVs in the current practice.

1	2	3	4	5
Never	**Low**	**Sometimes**	**Often**	**Always**
			√	

Section B: Level of Influence of Contractual Issues in CJVs

Please score the contractual issues based on its level of influence on CJV failure by using a '√' by considering the criteria given.

	Level of Influence				
	Much Lower	**Slightly Lower**	**Normal**	**Slightly Higher**	**Much Higher**
	1	**2**	**3**	**4**	**5**
Strategic Management					
Entering to JVs based only on qualification/resources			√		
Incompatibility of project objectives		√			
Disparity of goals between the members of the joint venture				√	
Inadequate business plan development	√				
Lack of commitment of top management		√			

Inadequate development of strategies for facing competition in the market				√	
Failures with respect to their political, social and legal and government procedures			√		
Partner Selection					
Not having formal guideline for partner selection					√
Unclear partner role of JV partners			√		
Amount of contribution and participation of JV partners					√
Unequal negotiating power of project partners			√		
Inadequate training and expertise of facilitators		√			
Unfamiliarity and misunderstanding of partnering concept by project participants		√			
Cultural Issues					
Differing perceptions of reality between the channel members				√	
Hasty associations of partners			√		
Inadequate recognition of demands in a cross cultural environment		√			
Leakage of information to outside parties			√		
Performance					
Disagreements on the definition and the measure of performance		√			
No proper mechanism for performance measurement	√				
Risk Allocation					
Risk sharing issues by JV partners			√		
Profit and other benefits sharing issues by JV partners				√	
Facing losses and damages resulting from a breach of the agreement or misrepresentation		√			
Facing unavoidable events					√
Financial Issues					
Issues in generating progress payments				√	
No proper way to deal with additional installments			√		
Unwilling to make additional contributions by JV partners				√	
Accounting and auditing related issues				√	
Liability and Indemnity					

Not having predetermined liability of JV partners			√		
Incompatibility between interpersonal relationships			√		
Breaking trust and confidence among the partners		√			
Lack of commitment by partners				√	
Differences in management styles and organization culture				√	
Inadequate corporation of partner organisations			√		
Ending of JV					
Not having a formal exit mechanism				√	
Ineffective conflict resolution between the JV partners					√

6) What are your suggestions to overcome the issues of CJVs?

We have faced lots of issues without having pre-determined provisions in JV agreement when dealing with our JV partners. Some of them were really critical to handle. Therefore, introducing a formal mechanism for CJVs is important. Specially, there should be a national level regulatory body for governing CJVs to make them effective in operation without disputes and issues in between partner organizations.

……Thank You…….