

## Managing Sustainability into Contracts – Conditions of CSI, AIA, FIDIC and EJCDC<sup>1, 2</sup>

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### ABSTRACT

Nowadays, sustainability is a key issue in all aspects of our life. Unfortunately, it is a topic, which is not enough considered as an important matter as humans tend to look at the short term over the long-term. This paper is developed to analyze the issue and use the Additive Weighting technique to compare different standard forms such as the Construction Specifications Institute (CSI), American Institute of Architects (AIA), the International Federation of Consulting Engineers (FIDIC) and Engineers Joint Contract Documents Committee (EJCDC). By using the additive weighting technique, we are going to prove which documents have the best clauses regarding the management of sustainability into contracts.

**Key words:** Contractors, Sustainable development, Collaboration, Outcomes, Communication, Limits

### INTRODUCTION

Nowadays, the question of sustainability is a very important topic in which every one of us should be concerned and involved with. Indeed, our humanity is probably facing its biggest challenge as many environmental issues have been rising in the last decades. It is also one of the most complicated topics to work on as a considerable amount of people; energy and large-scale coordination need to be acquired.

Sustainability is defined as the process of not being harmful to the environment by keeping it safe for the present and for the future generations.

Climate change is a worrying thing. Atmospheric CO<sub>2</sub> levels are not falling and politicians meet a lot of difficulties in finding concrete solutions to improve the situation. Global warming is the

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<sup>1</sup> Editor's note: Student papers are authored by graduate or undergraduate students based on coursework at accredited universities or training programs. This paper was prepared as a deliverable for the course "International Contract Management" facilitated by Dr Paul D. Giammalvo of PT Mitratata Citragraha, Jakarta, Indonesia as an Adjunct Professor under contract to SKEMA Business School for the program Master of Science in Project and Programme Management and Business Development. <http://www.skema.edu/programmes/masters-of-science>. For more information on this global program (Lille and Paris in France; Belo Horizonte in Brazil), contact Dr Paul Gardiner, Global Programme Director, at [paul.gardiner@skema.edu](mailto:paul.gardiner@skema.edu).

<sup>2</sup> How to cite this paper: Boudiaf, M. (2018). Managing Sustainability into Contracts – Conditions of CSI, AIA, FIDIC and EJCDC, *PM World Journal*, Volume VII, Issue IX - September.

result of the lack of precaution of all of us and the figures are alarming. According to a study made by the COP 21, “the temperature of the earth will soon become 5.8 degrees higher at the end of the century and the amount of carbon dioxide in 1800 was 31% less than the amount of carbon dioxide in the atmosphere today.”

## 1. Problem definition

Not everyone is fully involved or cares about fundamental questions about the evolution of our environment and many studies have shown that we will be in a critical situation in a few years if we do not make serious efforts towards the preservation of the environment. That is why building sustainability into contracts can make people change their habits thanks to the rules that the contractors will set. Therefore, people will be more aware of the matters that occur today and hopefully care more about environmental issues in the future. Many research studies on how to improve sustainability thanks to contracts and integrate sustainability into those have been conducted and this is what we are going to observe through our analysis.

Finally, the aim of this paper is to analyze how the sustainability, with the comparison of different organization standards such as CSI, AIA, FIDIC, and EJCDC is included in the contracts.

Considering this, we will be able to answer the question:

- Which sustainability clauses in the AIA, CSI, FIDIC, EJCDC support the most sustainability?

## **METHODOLOGY**

In the analysis of this paper, we will use two techniques: one noncompensatory MADM methods which are the dominance method and one compensatory MADM method which is the Additive Weighting technique.

Those two methods are very helpful as it will be very easy to compare which method is the best. As said before, we planned to compare the sustainability methods in different standard forms such as CSI, AIA, EJCDC, and FIDIC. By using these techniques, we could easily find out a better or the best term in their statement, and clearly, know what best method supports sustainability.

## 2. Development of the feasible Alternatives

From this, it will be possible to define alternatives about the management of sustainability into contracts:

- **CSI clauses regarding sustainability**
- **AIA clauses regarding sustainability**

- **FIDIC clauses regarding sustainability**
- **EJCDC clauses regarding sustainability**

### 3. Development of the outcomes and cash flows for each alternative

The first alternative, **CSI clauses regarding sustainability** will show us what clauses regarding sustainability are defined. In CSI, there is a clause dedicated to the sustainability requirements (4.3.3) which states that: “Depletion of natural resources, deteriorating environmental conditions in formerly pristine parts of the world, rising human population, loss of animal and plant species to extinction, and economic competition from developing nations have raised public awareness of facility design, also called green design.” In these requirements, there are 4 clauses that foster a way through sustainability (4.3.3.1: sustainable design principles; 4.3.3.2: Environmental design tools; 4.3.3.3: assessing product sustainability; 4.3.3.4: assessing facility sustainability). All these clauses show that there is a high commitment by the CSI towards sustainability.

In the second alternative, **AIA clauses regarding sustainability**, we can see that not a lot of writing is put regarding sustainability. Indeed, there is only one sub-clause that deals with sustainability (4.3.6) and this clause does not go deep to propose solutions towards sustainability.

In the third alternative, **FIDIC clauses regarding sustainability**, there is a clause dedicated to the sustainability in section 4 (The contractor). It is named “protection of the environment” (4.18) and states that the contractor “should take all reasonable steps to protect the environment and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations”. Here again, we can notice that as in the AIA clauses, not a lot of statements are put towards the sustainability and the protection of the environment.

In the 4<sup>th</sup> alternative, **EJCDC clauses regarding sustainability**, we can find an article dedicated to the environment (ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS). In this article, some clauses are written regarding the protection of the environment that the contractor should respect. Here is an example of one clause: “Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.”

It shows that the contractor is responsible for keeping an eye on the environment and therefore indirectly for protecting it.

#### Step 4- Selection of the Acceptance Criteria

In order to evaluate each of the alternatives, we will use the **Multi-Attribute Decision Making (MADM)** process by using the DOMINANCE method. This method is one of the noncompensatory approach methods proposed by the Multi-attribute decision making (MADM) tool. It is using PairWise comparison to weight all alternatives equally.

We already see in the matrix below that the EJDC is the worst solution and on the contrary, that CSI is the best solution thanks to the Dominance Method.

Attributes	CSI VS AIA	CSI VS FIDIC	FIDIC VS EJDC	CSI VS EJDC
Clear statement	BETTER	BETTER	EQUAL	BETTER
Easy to understand	BETTER	EQUAL	WORSE	BETTER
Safety	BETTER	BETTER	WORSE	BETTER
Confidentiality	BETTER	EQUAL	BETTER	EQUAL
Legal constraints	BETTER	EQUAL	EQUAL	BETTER
<b>DOMINANCE?</b>	<b>YES</b>	<b>YES</b>	<b>MAYBE</b>	<b>YES</b>

In this table, the author compared the performance of all the documents for each criteria using the Dominance method. And we can obviously see that the document CSI dominates the most for each criterion.

#### **FINDINGS**

#### Step 5- Analysis and Comparison of the Alternatives

Alternatives	CSI	AIA	FIDIC	EJDC
Training/Following/Support	1	0	0	1
Duration effectiveness	1	0	1	0
Safety	1	0	0	1
Cost	0	0	0	0
Legal constraints	1	1	1	1
Opportunities development	1	1	1	1
<b>SUM</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>4</b>

Thanks to this matrix, we can see that the CSI is the most relevant document regarding the management of sustainability into contracts.

**Additive Weighting Technique**

Attributes			CSI		AIA		FIDIC		EJCDC	
Training	5	0,24	1	0,24	0	0	0	0	1	0,24
Duration effectiveness	2	0,05	1	0,05	0	0	1	0,05	0	0
Safety	4	0,18	1	0,18	0	0	0	0	1	0,18
Cost	1	0,1	0	0	0	0	0	0	0	0
Legal constraints	5	0,15	1	0,15	1	0,15	1	0,15	1	0,15
Opportunities development	5	0,28	1	0,28	1	0,28	1	0,28	1	0,28
SUM	21	1,00	SUM	0,9	SUM	0,43	SUM	0,48	SUM	0,85

**Step 6- Ranking of the Alternatives**

This leads us to our 6th step in which the author selected the preferred alternative based on the Additive Weighting technique. As said before, the CSI document dominates clearly the other alternatives as it has almost better attributes than all the others. And as seen in our 3<sup>rd</sup> step, the CSI document is the one that has the most clauses regarding the management of sustainability and therefore the one that is the most involved in sustainability.

Therefore, after having demonstrated that the CSI document is the document that provides the best outcomes regarding the management of sustainability into contracts, we can clearly say that our preferred alternative is the CSI document.

Having demonstrated that, we can encourage contractors to use this document instead of others to manage better sustainability. Furthermore, using the CSI document for managing sustainability will have many benefits such as a better understanding of how to keep a good sustainability or an easy understanding of the rules that are put into the contracts.

However, as shown in the Additive Weighting technique model that the author has put on the step 5, you can notice that the EJCDC document has also very good attributes and can be also a good document for managing sustainability into contracts.

### Step 7- Performance Monitoring and Post Evaluation of Results

The 7<sup>th</sup> and last step of our analysis is related to how we can monitor the performance of the recommendations we give you. Based on all the terms we discussed and the Dominance analysis, here are several suggestions for managing sustainability into contracts:

- 1) **Use a risk assessment model** to identify the sustainability objectives of the contract. These will form the objectives for implementing sustainability in your contract.
- 2) **Suggested Pre-Qualification Questions.** Include some questions such as: Does your company have a sustainability policy and how does it operate to implement that policy?
- 3) **Suggest requirements.** Suggest some requirements regarding the strategy that you can implement to build sustainability into a contract.
- 4) **Suggested method statements.** Include method statements relevant to the Suggested Requirements that you selected in the contract.

### **CONCLUSIONS**

In this paper, we tried to demonstrate how managing sustainability into contracts is important. As said earlier in the introduction, sustainability is a topic that everyone should be aware of and be involved with. Building sustainability into contracts has an important positive impact for businesses and society in general.

Throughout our analysis, we could find that the management of sustainability into contracts is inadequate. We demonstrated that by comparing the CSI, FIDIC, AIA and EJCDC forms as we have noticed that not all the documents put a lot of efforts regarding sustainability, especially AIA and FIDIC.

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