

Sustainable Activism & Ecology: New Challenges in the Construction Field^{1, 2}

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ABSTRACT

The following paper is treating today's context, where the construction field is one of the major cause of pollution in most countries of the world. It actually has deep impacts on public health, soil and air. The following analysis is doing a comparison between international contracts frameworks to show what would be the best alternatives or which one is worth using for a green construction project. After developing how frameworks can be used for a sustainable construction they will be compared using *relative weighting technique and the additive weighting technique*. As a results of the analysis we will rank the best alternatives to find out the Consensusdoc and the American Institute of Architects provide satisfying frameworks for green buildings. In the end the consensusdoc best fits today's green challenges as it give substantial guidance for establishing and achieving green measures.

Keywords: Environmental impact, Energetic performance, Governmental constraints, Risk Management, Green Constructions, Green measures, Sustainable requirements

INTRODUCTION

Since the industrials revolutions there's two things we can affirm, the population are gathering in cities while the farming activity has decreased but still has to be more efficient. The construction field is walking on a path that has consequent effect on the water life cycle, biodiversity and the overall quality of the air. When we look more in depth at this situation; we understand that constructions are largely responsible for the emission of greenhouse gases. In Switzerland, 22 million tons out of 55 million tons of greenhouse gases are from constructions

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activities. This field, due to its core business, requires large amounts of water and other energies, in France it's representing about 50% of total energy consumptions. Constructions are also generating waste, and still in France only 61% is recycled. Governments, Companies and society are slowly becoming greener, but as companies have great responsibilities in the green transition they are required to be fast. Such a radical transition cannot happen without any risks.

With those concerns we can differentiate two streams that imply risks. The first one will obviously be the state. By setting up sustainable oriented and green laws the state may add new risks for companies. Those risks can take the format of fees, contributions, taxation, penalties and other sanctions.

If risks are firstly implied by governmental decisions, they are also implied by non-governmental entities (NGO, communitarian initiatives). If companies don't respect certain rules of common sense regarding green behavior, they can be the targets of boycott, denunciations and other actions that could affect their notoriety.

Saying that, those actions might have strong impacts on the health of a company. Sustainable related risks measurement is becoming a point that can't be ignored for long-term strategies otherwise outcomes of a contract could be affected. The overall reflection will be analyzed through concepts such as the Consensus Doc, the AIA and the Virtue Matrix concepts, but also through governmental documents (laws articles).

During the whole article, I will provide statements and elements of analyses to answer the following questions:

1. In today's legal context, what are the risks implied by laws concerning sustainability?
2. What kind of measures can be taken to comply with local law and today's challenges?

METHODOLOGY

1) PROBLEM RECOGNITION

The following analysis is going to:

- Highlights the risks implied by sustainable requirements at a legal level and a societal level
- Do a comparison between sustainable terms and conditions from AIA, FIDIC, EJCDE, and CONSENSUS Doc in order to determine which one best fits sustainable challenges.

2) FEASIBLE ALTERNATIVES

- a) Follow FIDIC guidelines
- b) Follow AIA guidelines
- c) Follow EJCDC guidelines
- d) Follow CONSENSUSDOC guidelines

3) DEVELOPMENT OF OUTCOMES

a) Follow FIDIC guidelines

The FIDIC document looks in appearance like an appropriate set of good practices. Sustainable term and conditions are more directed onto contractor's responsibilities. To sum up, the document is practically advising the contractor to respect as much as he can the environment by reducing (at his costs) all damages to the environment and people close to construction's site. However, the sustainable terms and conditions of FIDIC seems more like advising, and almost common sense more than real directive that would force the contractor to have a good or at least a neutral impact on the environment. Furthermore FIDIC doesn't give any sanctions in case of bad practices. Adopting a realistic point of view, no contractor would spend too much on environmental protection if costs are too high and if he has no risks of getting penalties.

b) Follow AIA guidelines

The American Institute of Architects doesn't give substantial guidelines for sustainable behavior. However it advises both owner and contractor to acquire green certifications such as LEED's certification that will have stricter guidelines concerning sustainability and environment impact and performance. If rating frameworks exist in order to evaluate how much a construction project is sustainable, the AIA doesn't constraint at all the contractor and the owner on a sustainable and environmental perspective.

c) Follow EJCDC guidelines

EJCDC appear to be the most noncommittal framework for sustainable constructions. Sustainability and environmental related subjects aren't clearly treated through the overall document. What can be understood, is that it's on the behalf of the relevant entities to promote sustainable challenges to the owner, those entities will be mainly engineers and architects. However setting green measures is not mandatory which means that the owner can actually avoid any form of constraint on that matter if he judges it too risky on a financial perspective. The EJCDC suits for pragmatic approach of sustainable construction.

d) Follow CONSENSUSDOC guidelines

Through ConsensusDoc, the question of green measures is highly tackled. It also includes a third party for a better accomplishment of those measures whose called a “Green Building Facilitator”. However the biggest negative point might be that it’ only on the behalf of the owner to include green measures on a construction project. If both owner and contractor have to respect local laws, only the GBF will be responsible for the failure of green measures. In the end having a third party still help the whole project to comply with green challenges.

4) SELECTION CRITERIA

The selection of the best alternative that will fit today’s challenges in term of sustainability and energetic performance will be conduct through a Multiple Attributes Decision Making matrix in order to have an overview of each framework from feasible alternatives.

The attributes used for the MADM are the following:

- Is sustainability promoted throughout the document
- Does the document give guidance for setting green measures?
- Does the document fit sustainable requirements for “green certifications”?
- Does the framework cares about the costs that green measure represents?

Multiple Attributes Decision Making				
Attributes	FIDIC	AIA	EJCDC	CONSENSUSDOC
Sustainability promotion	Yes	Yes	Depend on architect/engineer	Yes
Guidance for green measures	No framework	Non directly (only through certifications)	No framework	Framework given
Ease to get certification	Not mentioned	Highly recommended	Not mentioned	Done by the GBF
Cost oriented framework	Depends on feasibility	Not mentioned for sustainable measures	Highly depends on financial aspects	Not mentioned for sustainable measures

FINDINGS

ANALYSIS AND COMPARISON OF THE ALTERNATIVES

Relative Weighting

Quality	Score
Excellent	3 and above
Good	More than 2
Fair	More than 1,5
Poor	0 to 1,5

Multiple Attributes Decision Making				
Attributes	FIDIC	AIA	EJCDC	CONSENSUSDOC
Sustainability promotion	0,60	1	0,45	1
Guidance for green measures	0	0,50	0	1
Ease to get certification	0	0,8	0	1
Cost oriented framework	1	0	1	0
TOTAL =	1,60	2,3	1,45	3

Additive weighting technique

Attributes	STEP 1	STEP 2			FIDIC		AIA		EJCDC		CONSENSUSDOC	
	relative rank	Normalized weight (A)			(B)	(A) x (B)	(C)	(A) x (C)	(D)	(A) x (D)	(E)	(A) x (E)
Sustainability promotion	2	2/10	=	0,2	0,6	0,12	1	0,2	0,45	0,09	1	0,2
Guidance for green measures	4	4/10	=	0,4	0	0	0,5	0,2	0	0	1	0,4
Ease to get certification	3	3/10	=	0,3	0	0	0,8	0,24	0	0	1	0,3
Cost oriented framework	1	1/10	=	0,1	1	0,1	0	0	1	0,1	0	0
SUM =	10		SUM	1	SUM	0,22	SUM	0,64	SUM	0,19	SUM	0,9

Additional point of analysis

In order to give a proper analysis and to rely on the selections of alternatives on other statement, it's important here to remember what are the main issues and challenges with green measures, as it's important for those frameworks to satisfy contemporary issues.

Nowadays, it's crucial to comply with green behavior because of the following reasons:

- Make life on earth sustainable from an environmental point of view
- Economic health
 - Respecting green laws make you avoid penalties and other compensation.
 - Making an existing building sustainable can help reduce approximately 90% of energy consumptions (and consequently the bill)
- Education
 - Younger generations tend to adopt green behavior when they grow up within a eco-friendly environment

SELECTION OF PREFERRED ALTERNATIVE

Using both the relative weighting technique and Additive weighting technique we can have a precise ranking idea of the best alternatives to our problem

1. *Consensusdoc*
2. *AIA*
3. *FIDIC*
4. *EJCDC*

Those scores show how much a contract framework can satisfied the attributes from MADM matrix. Giving some comments, ***Consensusdoc is presented as the best alternative*** for the respect of contemporary's issues concerning environment, having a GBF makes a substantial difference with the other frameworks as he's entirely responsible of green measures. The AIA gives also a satisfying alternative, as long as both owner and contractor find an agreement to apply and obtain at least one green certification to have a minimum of guidance on green measures. Both FIDIC and EJCDC's frameworks doesn't give a solution that would allow green challenges to be respected.

MONITORING POST EVALUATION PERFORMANCE

To monitor how well a project went using the recommendation above, the simplest way will be to do a comparison in order to provide relevant & quantitative materials. Here there's two case of figure, the first the case of a rebuilt building (or renovation) the other case will be a brand new building. To monitor the first case there's a need of comparing the previous energy bills (electricity consumption, water consumption, etc.), with the actual one ; if the most recent cost less than the previous one, then adopting a new way of contracting and adopting green measures is a success. On the second case of figure the principle is the same, but instead of comparing with the previous buildings, the bills of the new building will be compared to similar buildings that haven't used the same contract framework and haven't adopted green measures. Furthermore, the certifications organisms can provide evaluation to help the monitoring process.

CONCLUSIONS

There was two major questions though the paper. The first was to determine the risks implied by local laws concerning green measures. Those risks mainly take the form of financial consequences; meaning that, if the law is not respected while constructing and during its life cycle a building, fines, compensations, or other taxes will be applied. In the majority of cases, laws are concerning carbon footprint and energy consumption.

The other question was to determine what could be achieved to comply with today's issues from an environmental point of view, and by this bias, avoid the risks mentioned. The paper has compared some contract frameworks that would best fit sustainable challenges. We can now affirm that the best framework that would help the achieving of green measures by an owner and a contractor on a construction project would be the CONSENSUSDOC as it provides guiding materials and gives responsibilities to a GBF. By this way, even though an owner or a contractor are not that involved with environmental matters, green measures can still be respected by involving a third party on a contract that will be specialized in sustainable requirements.

FOLLOW ON RESEARCH

However in most cases, it's on the behalf of the owner and the contractor to respect green issues, they can act as green activists, but it implies that at least one of them is concerned. When some contract's framework aren't constraining them to apply green measures how companies and the overall society can effectively respect the environment. In a context where governments can't find agreement on environmental concerns and at the same time scientists affirm that earth is walking on the worst path, who can apply have deeper influences on companies ?

BIBLIOGRAPHY

- AIA. (2017). *A201- 2017 general conditions of the contract for construction..* Retrieved from <https://www.aiacontracts.org/contract-documents/25131-general-conditions-of-the-contract-for-construction>
- BALOI, D. (2003, September). Sustainable construction: challenges and opportunities. 19th Annual ARCOM Conference. Association of Researchers in Construction Management, Retrieved from http://www.arcom.ac.uk/-docs/proceedings/ar2003-289-297_Baloi.pdf
- BERRY, C., & McCarthy, S. (2011). Guide to sustainable procurement in construction.. Retrieved from <https://www.brebookshop.com/samples/326674.pdf>
- BILAU, G. (2008). Challenges Facing the Green Building Industry. Retrieved from [http://www.iapmo.org/Official Articles/2008-09-Challenges-Facing-the-Green-Building-Industry.pdf](http://www.iapmo.org/Official%20Articles/2008-09-Challenges-Facing-the-Green-Building-Industry.pdf)
- Dr.GAY, J-B. (2004). Les impacts environnementaux de la construction : comment les réduire ?. Retrieved from <http://docplayer.fr/19062170-Les-impacts-environnementaux-de-la-construction-comment-les-reduire.html>
- Consensusdocs. (2017). Consensusdocs construction contracts. Retrieved from <http://www.consensusdocs.org/>
- ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE. (2007). STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT. Retrieved from <http://www.sdsinc.org/wp-content/uploads/05-GeneralConditionsQpodd.pdf>
- GreenBuilding.com. (2003, September). Energy in Green Building. Retrieved from <http://www.greenbuilding.com/wp/portfolio-item/case-study-3/>
- International Federation of Consulting Engineers. (1999). Construction contract 1st ed (red book). Retrieved from <http://fidic.org/books/construction-contract-1st-ed-1999-red-book>
- Ministère de la transition écologique. (2009). La consommation énergétique des bâtiments et de la construction. Retrieved from <http://www.statistiques.developpement-durable.gouv.fr/lessentiel/ar/326/1097/consommation-energetique-batiments-construction.html>
- MONTEREMAL, M. (2017). Entreprise du BTP: 227,5 millions de tonnes de déchets en 2014. Retrieved from http://www.statistiques.developpement-durable.gouv.fr/fileadmin/documents/Produits_editoriaux/Publications/Datalab_essentiel/2017/datalab-essentiel-96-btp-mars2017-b.pdf

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Jérôme Andriamirado graduated with a Bachelor's Degree from NEOMA Business School with minor in SME's management and is now a project management student at SKEMA Business School with a business development focus. His diverse professional experiences have developed an entrepreneurship sensibility as most internships have been done in human sized companies and start-ups from various fields, from human resources companies to digital companies. Aware of today's overall environmental situation he believes that one of the solutions to improve public health and sustainability from an environmental perspective and societal perspective must go through green construction, as greener and cheaper housing and business building can help to face diverse crises. His ambition is to work in a green company from an entrepreneurial perspective. Jérôme can be contacted at jerome.andriamirado@gmail.com.