**Understanding Regional Sustainability in the Built Environment**

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**Sub-theme 4**

Design management, design thinking: a dynamic capabilities perspective

**Abstract**

Many standards, tools and references are available to approach and assess the sustainability in the built environment. However, most of the available tools are strongly rooted in the technical rationality and neglect and avoid the complexity of cities. Within the overall problematic of attaining sustainability in in the built environment, this paper explores the role assessment in shaping our collective understanding of sustainability, the importance of understanding the gap that exists between the perceptions and priorities of regional users and experts, and highlights how this understanding can move us towards regional sustainability. The works of various system and complexity thinkers, social theorists, and sustainability theorists is used to highlight that sustainability is made of different coexistent realities that cannot be reduced to a single existing paradigm. The then research proposes a 2-phases and 2-domains for regional sustainability which aims to model complex regional sustainability. The possible application of this framework in a variety of projects types is presented. This research proposes new models for sustainability that are more inclusive, and that are rooted in the complexity of regional objectivity and regional subjectivity. The paper specifically contributes to the theory of sustainable design by clarifying the unique and non-conflicting sustainability expertise that co-exist at the local/regional and expertise domains.

**Keywords:** Sustainability in the built environment; Sustainability assessment tools; Complexity; Regional priorities; Expertise

## Introduction

The simplest definition for sustainability involves the environment, the society and the economy. Scholars also argue that its definition should be extended to include ethics (Ehrenfeld, 2009). Sustainability in the built environment has become a vast field of research, a design focus, and a topic of theorization (McLennan, 2004; Walker, 2006, 2015; Cucuzzella, 2015b). However, sustainability in the built environment is complex: it is made of many interlinked elements (McLennan, 2004; Newsham, Mancini, & Birt, 2009; Cucuzzella, 2015a, 2015c; Paul James, 2015; Sterman, 2015). These elements are scattered between the components of sustainability (i.e. economy, society, environment, and ethics), and fall in different scopes and scales geographically (i.e. global, regional and local) and temporally (i.e. long, medium and short terms) (Wilbanks, 2007; Klumpp, de Leeuw, Regattieri, & de Souza, 2015; Ni, de Souza, Lu, & Goh, 2015). Researchers propose that the polarities that exist in the approaches, definitions and understanding of sustainability can be understood as a series of tensions that are the result of paradigmatic differences between the different disciplines and stakeholders (Cucuzzella, 2015b). The methodological, and sometimes epistemological or ontological, differences between the fields of the building industry have added complication to the already complex nature of sustainability (Fisher, 2008; Ehrenfeld, 2009; Fry, 2009).

Today, many standards, tools and references are available for designers, developers or researchers to approach and assess the sustainability of buildings and urban areas (Brandon & Lombardi, 2010). However, most of the available tools are strongly rooted in the technical rationality (Cucuzzella, 2015b). In the past years, environmental design has shifted from searching for holistic ecological solutions to a technologically driven and shallow approaches that are focused on eco-efficiency and optimization, and that are based on highly structured principles (Naess, 1973; Jonas, 1979; Fletcher & Goggin, 2001; Madge, 2008). These technical solutions to sustainability revealed several limitations due to the normative nature of their analyses tools, their fragmented project analysis processes, and their ignorance to the crucial social and cultural questions (Papanek, 2000; Orr, 2002; Cucuzzella, 2009). The prescriptive nature of the assessment tools left little or no room for exploration and innovation, the detailed and specific analysis processes resulted in the fragmentation of projects and the reduction of the built environment to quantifiable elements. Additionally, the neglect of the social and cultural questions has resulted in the marginalization of users and urban dwellers and the neglect of the social, environmental and economic realities that exist at the regional level. Although new assessment tools are still being developed, many authors still argue that we are unable to capture the complexity of sustainability (Walker, 2006; Newsham et al., 2009; El-Shenawy & Zmeureanu, 2013; Cucuzzella, 2015a, 2015c; Gibberd, 2015; Rashid & Yusoff, 2015; Sterman, 2015).

Within this context, it is seen that the current sustainability trends neglect and avoid the complexity of cities: cultures, communities, complex social fabrics, diversity, and political realities are avoided and commonly replaced by objective quantitative measures and techno-centric universal approaches (Walker, 2006; Brandon & Lombardi, 2010). The important and influential role of assessment tools in guiding urban development and shaping the urban context leads to questioning how considering the urban, contextual and social realities, as well as the regional and local priorities, in the sustainability assessment of buildings can change how buildings are assessed, how they are designed, developed and described within their context, and even how building programs are developed.

Due to the very large scope of the previous question, this research paper aims to specifically focus on developing a method that can help better the understanding and contextualization of the regional and local sustainability priorities within the current universal trends. The paper starts by exploring the key role assessment tools play in shaping our collective understanding of sustainability, the importance of understanding the gap that exists between the perceptions and priorities of regional users and experts, and how this understanding can help designers, architects, engineers, organizations and even policy makers redirect towards regional sustainability. The relevance of paradigms, interdisciplinarity and system thinking to the topic of sustainability and sustainability assessment in the built environment is presented through an in-depth review of literature. By presenting an overview of the current state of the building industry, of new approaches to sustainability assessment, and by analyzing of the role and nature of expertise in sustainability, this research paper builds a possible framework, a 2-phases a matrix or “semiotic square” (Greimas & Rastier, 1968), that can be used to model and approach the complexity of regional sustainability. This framework is strongly rooted in the systems paradigm (Checkland, 2000; Morin, 2008) and based on an interdisciplinary approach (Max-Neef, 2005). The paper elaborates on the proposed framework, and it can be used in understanding and aligning the sustainability priorities, expectations and outcomes of projects. The paper finally explores the possible applications of the proposed framework in a variety of project types.

**Role of sustainability assessment tools and the building industry**

The building industry is strongly guided by codes and regulation that touch upon many topics relating to sustainability. Technical tools, software, methods, guides, and codes have been extensively developed by experts to normalize and standardize approaches to sustainability (NRC-IRC, 2011; Stein & Kung, 2012). Technologies such as photovoltaics and thermal solar and other renewables, advanced control methods, along with interactive and smart systems have been strongly advocated by the industry and is vastly supported by academic research (Wood & Newborough, 2007; Athienitis, 2015). On the other hand, and with the technological direction of sustainable buildings, the human factors – including users’ needs and aspirations as well as socio-cultural differences - have been largely excluded from the analysis process and reduced to standard operation schedules, and thus leaving out the contextual questions (Lee, Yi, & Malkawi, 201; Tabb & Senem Deviren, 2014). It can be argued that the technical and quantitative approaches are not adequate to be applied to buildings that are actively and innovatively used by people, and that exist within complex and ever changing social, economic and environmental contexts (Fisher, 2008; Ehrenfeld, 2009; Fry, 2009; Cucuzzella, 2015b). Additionally, these approaches are not able to cope with the complexity, duality of realities and the “axiom of the included middle” which are needed for strong transdisciplinarity (Max-Neef, 2005).

In recent work, researchers have highlighted how the techno-centric assessment tools have created a shift in the collective understanding of sustainability in buildings, and have strongly guided the architectural narratives, representation or even the design strategies - many buildings use technology or technical additions as communicative devices for the “greenness” avoiding critical approaches to sustainability in buildings (McLennan, 2004; Fisher, 2008; Cucuzzella, 2015a, 2015c). This phenomenon is well explained in the structuration process as suggested by Giddens (1984) and as presented in Figure 1 - quote from (Ehrenfeld, 2009). In fact, tools used for sustainability assessment constitute one of the main corners of the continuous complex process of structuration: they lead to observable changes in the outcomes, in the real world, and thus in our belief and collective understanding.



Figure 1. Structuration Process (adopted from: Ehrenfeld, 2009); after (Giddens, 1984)

Scholars have been exploring “softer” approaches to sustainability assessment. By combining measures of sustainability, researchers build key performance indicators (KPIs) and indexes that can be used to assess sustainability in buildings and urban areas (Boyko et al., 2012; Gibberd, 2015; Kylili, Fokaides, & Lopez Jimenez, 2016; Lynch & Mosbah, 2017). Today, a very large variety of KPIs and measures that are in use in different locations, regions or for different levels of assessment can be found in literature (Lynch & Mosbah, 2017). However, the correctness and validity of the selection processes of these KPIs for assessing the built environment in various contexts and regions is still widely debated - selecting the right indexes became a challenge of its own for designers and policy makers (Lynch & Mosbah, 2017; James, Magee, Scerri, & Steger, 2015). Three main approaches are generally available: (1) the top-down approach in which experts input is used to select indicators, measures and scales, (2) bottom-up approach in which the local community selects the relevant indicators, measures and scales, and (3) hybrid approaches in which parts of the system is selected by experts and others by local communities (Lynch & Mosbah, 2017).

Although, bottom-up and hybrid approaches create measures that are context/region specific and that cannot, up to now, be used in comparative studies (Lynch & Mosbah, 2017). In addition, the complexity of the assessment process, subjectivity of the results, and the hardship of validation makes these approaches not favorable by the industry professionals (Gibberd, 2015). Although the use of sustainability indexes offers certain flexibilities, compromises between the universal (objective experts input) and the local (subjective local interpretation) are always made. Additionally, studies have indicated a lack of focus on equity within most available indices (Sustainable Cities Institute, 2013; Gibberd, 2015; Lynch & Mosbah, 2017). To the knowledge of the authors, no studies have been found that propose an integrated framework that allows for exploring both bottom up and top down approaches concurrently.

**Paradigms, systems, interdisciplinarity and regional sustainably**

Interdisciplinarity has been advocated as a valid mean to tackle sustainability in the built environment (Walker, 2006). It can be argued that sustainability is one of the challenges that highlights the weakness of the building industry: each of the discipline involved in the hold its views on the topic independently with a lack of a framework to explicitly relate sustainability elements to physical or design elements (McLennan, 2004). The views of Max-Neef (2005) regarding “strong transdisciplinarity” are key to approaching sustainability since it requires a break out from the traditional paradigm of science, the linear and deductive Aristotelian tradition, in order to allow for the exploration of new paradigms that are embedded in complexity (Le Moigne, 1999; Morin, 2008). These new paradigms would be able to accept the duality of realities, to deal with the existence of multiple levels of reality, and most importantly to admit the logic of middles (Max-Neef, 2005). . This strong transdisciplinarity can help in moving away from the rationalization processes (Morin, 2008) that captivated the scientific paradigm and that sustainability has suffered from in the building industry. Burrell and Morgan’s *Sociological Paradigms and Organizational Analysis* (Burrell & Morgan, 2004) provides a very powerful tool which is based on two intersecting axes: 1) the sociology of radical change – the sociology of regulation, and 2) objective – subjective (Burrell & Morgan, 2004). Although this tool was developed for social theory, its use can be extended to understand the nature of the different approaches to the broad interdisciplinary topic of sustainability. Burrell and Morgan (2004) argue that, typically, the largest, and usually the most dominant, approaches to a topic are within very close proximity in regards to their ontological, epistemological, methodological nature, and human nature assumptions; the range that expresses the dominant orthodoxy in a subject (Burrell & Morgan, 2004). In sustainability, such orthodoxy falls in the functionalist/technical paradigm based on the prominence of quantitative objective methods of assessment and certification (Scofield, 2013). Guy & Moore (2007) argue that, through what they define as “critical pluralism”, sustainability can be practiced and applied in many ways within the field of architecture (Guy & Moore, 2007). Sustainability is one of the few endeavors where the human institutions (society, science and economy), human consciousness (ethics) must be reconciled with the natural establishment (environment – our planet). It can be argued that moving towards critical and regional sustainability requires a new paradigm which entails ontological restructuring and an epistemological revolution.

Various researchers have started to explore system approaches to sustainability. These approaches, although they vary in context and methods, start to contrast the deterministic approaches available in literature. In a chapter titled “Making the Business Case for Environmental Sustainability” in the edited book *Leading Sustainable Change* (Henderson, Gulati, & Tushman, 2015), Henderson identifies that today, despite the many advances and research in the field of sustainability, the topic is still defined in the business context as the mere reduction of environmental footprints (Henderson, 2015); a view that is highly aligned with the definition of shallow sustainability (Naess, 1973). This is directly paralleled in the building industry (Gibberd, 2015) since most of the assessment methods available today are tuned at reducing the environmental footprint of buildings during their operation. Henderson (2015) identifies 4 possible future scenarios with their statistical probability based on data gathered from various companies in the energy supply industry: (1) business as usual (42% probability), (2) sustainability is a demand driven opportunity (28% probability), (3) sustainability is a supply driven opportunity (18% probability), and that (4) sustainability goes mainstream (12% probability). Although some businesses, researchers or practitioners might choose to stick to working towards the highest probability scenario, the author urges all industry players to choose diversified approaches that allow for robustness and flexibility to adapt to any of the possible future scenarios: a balanced systematic approach (Henderson, 2015).

In another edited book titled *Humanitarian Logistics and Sustainability* (Klumpp et al., 2015)**,** Abidi, Kandel, Klumpp, & Zinnert (2015) and Schumann-Bölsche (2015) try to appropriate the use of supply chain and enterprise resource management tools to the sustainable operation of humanitarian missions; a process which can be extended to buildings and the built environment. . In such processes, the different interconnected elements and factors can be connected, controlled and monitored. Such monitoring and control can lead to higher levels of adaptability to natural or human aspects in the built environment. Even though some similar approaches are explored technically today (Athienitis, 2015), their applications are usually limited to energy and technical components of buildings and systems. In another chapter titled “Emergency Preparedness of Humanitarian Organizations: A System Dynamics Approach”, Ni et al. (2015) explore sustainability of humanitarian aid from a systems perspective. The systems approach that Ni et al. (2015) present is based on understanding the interconnections between the different elements at stake within the system. Similar to sustainability in the humanitarian aid field (Ni et al., 2015), the success and appropriateness of different sustainability approaches in the built environment is highly dependent on the characteristics of the region and the stakeholders, as well as the interconnectivity of all elements. Following (Ni et al., 2015), a possible systems map for sustainable building assessment is presented in Figure 2. Another key figure presented by (Ni et al., 2015) maps and locates different system elements in a 3‑dimensional grid that is built from the three components of sustainability (i.e. economy, social and environment), the geographic scope (i.e. global, regional and local), and the different temporal dimensions (i.e. long, medium and short terms). This 3-D map is a tool that can help build stronger assessment methods based on the understanding of the location of each of the elements along the three axes.

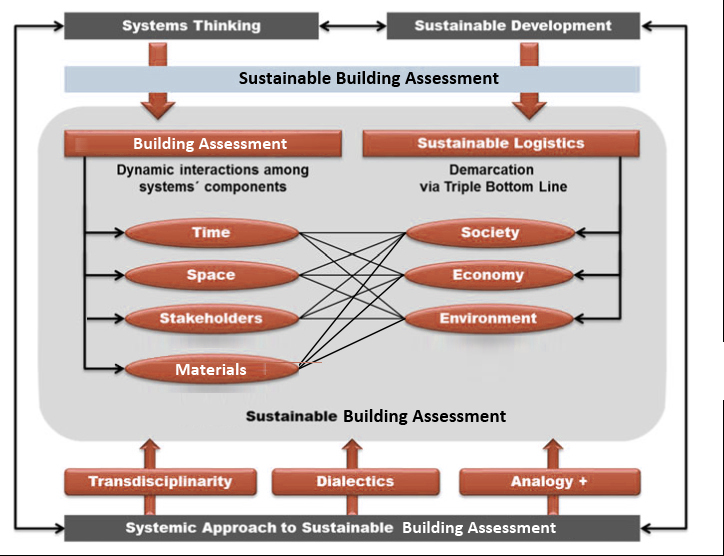
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Figure 2. A systems approach to sustainable building assessment aspired and adapted from (based on: Ni et al., 2015)

**Expertise in the context of sustainability**

Unlike highly technical and scientific fields of study, sustainability, and specifically in the context of the built environment, requires the collaboration and interaction of many stakeholders. The highly technical turn of environmental and ecological design made the field more exclusive to people with technical knowledge. Today, it can be argued that working in sustainability, and especially within the established technical definitions and norms, requires expertise (Cucuzzella, 2015b). Trépos (1996), in his volume on the “sociology of expertise”, highlights that expertise is far from a label awarded once and for all but rather it possesses a transient nature that is unstable. He indicates that being an expert requires a long process and, what he calls, evolving dedication (Trépos, 1996). Additionally, Jean-yves (1996) clarifies that the act of expertise constitutes a form of judgement that is directly bound to a specific place, time and a unique situation (i.e. a certain problem in a certain context). Most importantly, Jean-yves (1996) notes that expertise is not only constructed on the basis of interaction (interaction being the main differentiator between an expert and a professional), it is born from within a specific social framework in which it is imbedded and from which it cannot be removed. When reassessing sustainability experts from that perspective, it becomes clear that the current certification and accreditation are in direct conflict with the views of Jean-yves (1996): these accreditations aim to create permanent labels of expertise based on the accumulation of specific technical and theoretical knowledge. Collins & Evans (2007) propose to rethink expertise by providing a “periodic table” that explains the different types, levels and modes of judgement of expertise. Collins & Evans (2007) specifically argue that interactional expertise (the type that that Jean-yves mentions) is based on tacit-knowledge-laden in the language of a specific domain. Additionally, in order to be effective, Collins & Evans (2007) indicate that this type of expertise requires exceptional interactive and reflexive abilities. Using this view, one can see that, although the laypersons might have an understanding of sustainability principles and ubiquitous knowledge on the topic, they are excluded from the conversation on the issue through a process of downward discrimination: users are marginalized by the technical connoisseurship of the so called “experts” (Collins & Evans, 2007). Of course, in no way should the objective technical ecological and sustainability knowledge of today’s experts be mistrusted, however, the broad and bold use of today’s sustainability experts in all locations and time conflicts the very notion of their “expertise”. It can be argued that a large portion of today’s sustainable building experts do not have the interactional and reflexive abilities needed to navigate their way within all the fields that make up the building industry. More importantly, these experts cannot possess the basic ubiquitous knowledge to practice their expertise in all urban contexts and across all regions. In fact, and through this understanding of expertise (Trépos, 1996; Collins & Evans, 2007), it can be seen that regional users possess a unique and separate type of expertise in sustainability that experts lack. Each of the two groups’ expertise has a unique social framework and unique time/space applicability. Through a systems approach to sustainability, it can be recognized that both expertise (technical and regional) are relevant and curtail for moving towards regional sustainability.

Within the context of this paper, “experts” are defined as the professionals, consultants and/or managers of a specific project. More specifically, in the context of the built environment, “experts” are the people that possess contributory expertise (Collins & Evans, 2007) in the building industry. The “regional users” are defined as the beneficiaries or users of a project which occupy and/or will use the project, or members of the community in which the project will exist. In the context of the building industry, “regional users” are the prospect users and occupants of a building or space as well as the members of the community where project will be placed. It is important to note, that the definition of regional might span more than one geographic location, or be non-geographic, depending on the project’s nature and size.

**Towards regional sustainability**

Within the context set by the review and discussion of literature, and by drawing concurrently on the expertise of both regional users and experts, a regional sustainability understanding that is rooted in both regional objectivity and regional subjectively can be built. Such understanding can be key in guiding and directing projects and can be used to align projects objectives and outcomes to both the regional and expert domains. In contrast to the available approaches in literature that mix both approaches to arrive at middle grounds (Lynch & Mosbah, 2017), or that investigate multiple possible future scenario (Boyko et al., 2012), this paper proposes a framework where the sustainability priorities and perceptions of regional users and experts are assessed in parallel (Ni et al., 2015). Specifically, the proposed framework that, within a given context, explores concurrently the sustainability priorities and perceptions of both experts (following a top-down approach) and regional users (following a bottom-up approach). This framework is built on the main hypothesis that different and independent realities reside in the experts’ and regional users’ domains: realities that are separate from and rooted in each other. These realities form the complex interconnected system of regional sustainability (Morin, 2008). The 2-phases (pre and post project) and 2-domains (regional users and experts) proposed framework has the potential to offer the answer for the research questions presented by being able to model and represent those realities (and their interrelations) simultaneously. Thus, and through this independent exploration, this study aims to propose establishing a distinct understanding of regional sustainability that is composed of the coexistent and inseparable views of experts and regional users. Additionally, the framework, when used to analyze the pre-project and post-project phases at both the regional and expert domains, can provide insightful information for designers, policy makers and users in future projects. Figure 3 offers a visual representation of the framework proposed.

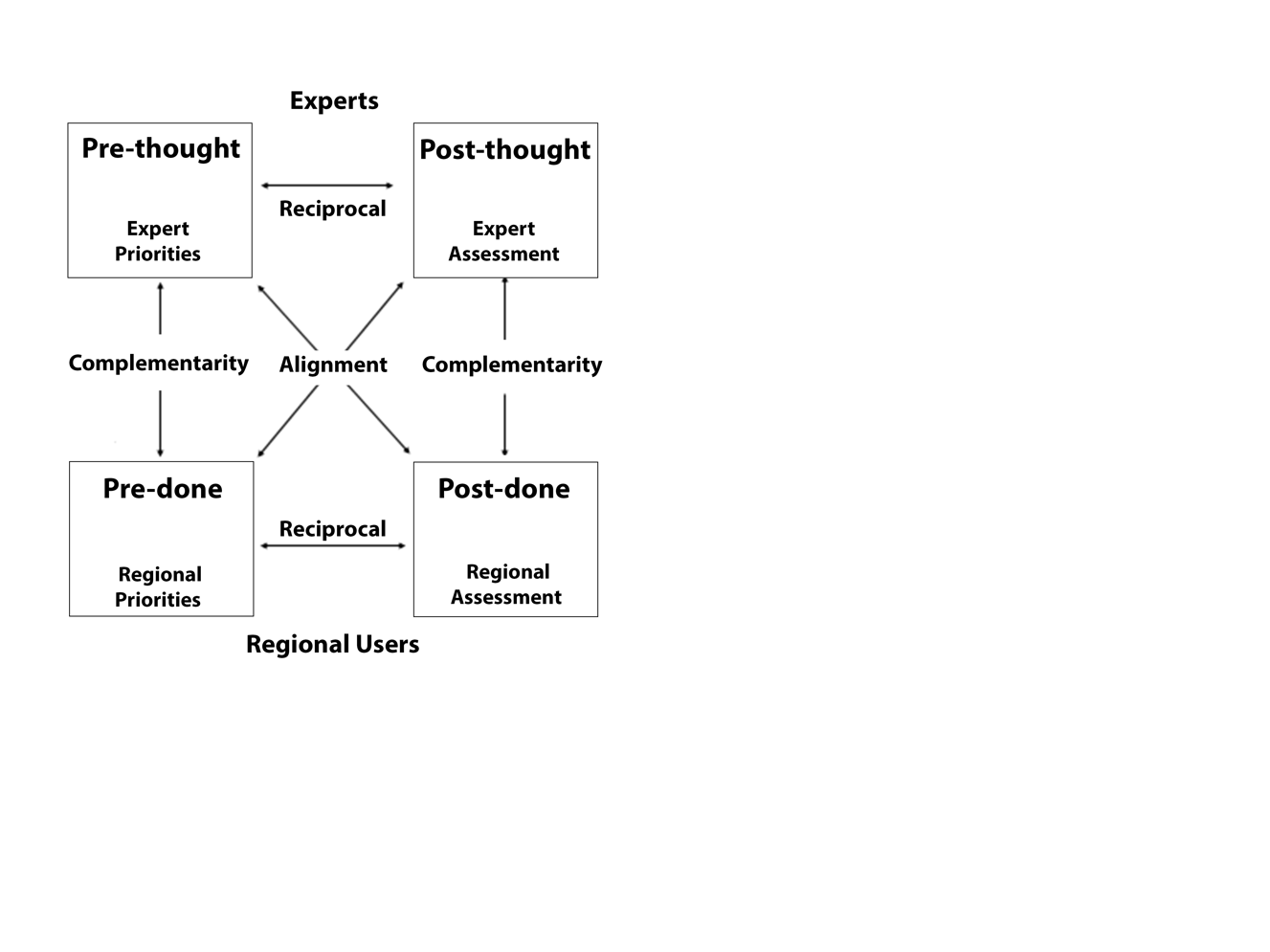


Figure 3. Proposed framework for modeling and understanding regional sustainability

The experts’ domain:

The upper two squares of figure 4 represent the activity that take place in the expert domain. The “Pre-thought” stage takes place just after the initiation of a certain project (in the building industry this would be the pre-design phase). At this stage, experts (consultants, city representatives and/or designers) project their sustainability priorities and knowledge onto a specific region and situation (i.e. project), and start to select, based on their expertise, the sustainability tools, knowledge, standards or references that could be used. The “post-thought” stage is when the formal assessment of the project takes place. For buildings, the application of assessment tools such as LEED (or others) takes place at this stage: the thoughts, ideas and work of the project-specific experts is assessed by others (who are also experts) using pre-existing or standard methods. In many cases, the assessment may start with project implementation and, in many cases, is only completed when the project is finalized. The relationship between the two presented stages can be thought of as reciprocal since in many cases, in today’s building industry, the priorities defined by experts at the “Pre-thought” stage is directly aligned with the expected modes of assessment (Cucuzzella, 2015c). In this domain, the assessment process is based on non-transmuted expertise that is only internal to the experts (Collins & Evans, 2007).

The Regional users’ domain:

The lower two squares represent the activities that take place in the regional users’ domain. The “Pre-done” stage takes place before the start of the project (prior to any changes in the region of interest). At this point, users can freely express their sustainability aspirations and needs in, and can indicate categories, items or elements that they perceive as sustainability priorities. Although they are not technical sustainability experts or professional, they possess ubiquitous tacit knowledge of their social, environmental and economic context (Collins & Evans, 2007): a location, time and situation specific expertise (Trépos, 1996). The “Post-done” stage happens at the completion and operation of the project. In the building industry, this is defined as post-occupancy stage. At this stage, regional users begin to develop their views and start to judge the project’s successes and failures. Although these views may vary depending on personal preferences, aspirations, knowledge, profession and could be affected by media, these views, together, express the general regional assessment of a specific project. Typically, this type of sustainability assessment has no rigid structure, and is based on complex judgement (Cucuzzella, 2015b). This assessment is mainly founded on transmuted knowledge that is external to the regional users (Collins & Evans, 2007). The relationship between these two phases can also be thought of as reciprocal since the two stages composes a system within regenerative properties and encompasses various internal feedback loops (Le Moigne, 1999; Checkland, 2000).

Relationships – complementary and alignment:

The “Pre-thought” / “Post-done” and the “Post-thought” / “Post-done” stages have a complementary relation. In order to initiate a project or assess it, both of these complementary pairs have to be considered independently to attain a more complete understanding of the complex reality of sustainability in a specific region. The alignment relationships that cross the 4 stages can be used to analyze and coordinate the complex system that the 4 stages are part of. This cross analysis can help regional users and experts to approach what can be called “critical alignment”: an alignment of ideas that does not mutilate or distort each domain’s unique perceptions and priorities. By cross-aligning the stages in the expert domain (expert driven) with the stages in regional domain, we arrive at what could be thought of as “regional objectivity”: an objectivity that moves away from universality, and that is more aligned with the regional perceptions, practices and context. This alignment would allow for experts to develop their priorities based on the modes of assessment used by the users of a specific region, and would create regionally objective assessment tools that are rooted in the priorities of regional users’. By cross-aligning the stages in the regional users’ domain (users driven) with the stages in expert’s domain, we arrive at what could be thought of as “regional subjectivity”: a subjectivity that moves away from egocentrism towards a more collective subjectivity that is aligned with regional beliefs, cultures, local interpretations and identities. For sustainability, such alignment can be done through addressing the collective intelligence of regional users using methods of process consulting, co-design and knowledge dissemination initiatives (Garrido, 2009; Putnik, 2009; Cucuzzella & Goubran, 2017). For many context, such collective intelligence, which aims at collectively solving issues solution and reaching common goals, is more accurate than the expert (Emond, 2016) This user driven alignment would allow for regional users to better imbed and their priorities within existing universal modes of assessment, and to understand, contribute and improve in developing relevant priorities in the experts’ domain.

**Possible applications of proposed framework**

The proposed framework can be used in various projects at different scales within urban areas. One of the most important applications would be in public building projects. Public buildings (schools, hospitals, universities and others) and the services they provide are crucial to cities and to urban management. According to the United Nations, these public buildings can create very large opportunities for economic development and significant expansion in the access to services (United Nations, 2014). Generally, many stakeholders are actively engaged in the development of public buildings (including, but not limited to, local residents, governments, municipalities, consultants, professionals, and in some cases land owners). Understanding the sustainability priorities of the region and community where public projects are imbedded and the correct management of sustainability expectations are both crucial to attaining regional sustainability. By understanding the regional priorities of prospective users and local residents, the building programs (developed even prior to the design of the building) can be adapted, through mix use approaches and future planning, to match the local aspiration and needs (needs of services, spaces, social structures or others). Additionally, these priorities can help experts select appropriate sustainability assessment tools, or adapt them, in order to ensure that they are relevant to the local practices and culture. Such alignment can maximize the regional benefits and buy-in in sustainability initiative in public buildings which can lead to higher social, environmental and economic returns on the public investments. The cross alignment between the regional assessment and the experts’ priorities can also assist policy makers and governments in understanding the applicability of various sustainable development approaches to different geographic or social sectors. This can help be an assessment of the experiential learning process involved in sustainable development projects which can create local and regionally aligned “know-how”. Current research already highlights that the gap between policies and local priorities and expectation is present in the development of sustainable public buildings. City policies and plans include sustainability policies and objectives for public building projects that are disconnected from the local contexts and needs which contribute to shallow sustainability approaches in buildings (Cucuzzella, 2011).

Transportation projects can also benefit from using the proposed framework. In many cases, specifically in the global south, the transportation and urban development models that are adapted by governments pose huge challenges to the continuity of traditional ways of living and low-carbon modes of travel (Hall, 2016). Many scholars have focused their research on the effect of the motor-vehicle centered urban model has on the reduced pedestrian and bicycle access within Indian cities (Badami, 2009). Many of the research strongly highlights the gap between city dwellers perspectives and priorities and those used by experts in the development of transportation projects and policies in cities (Hall, 2016; Joshi, Joseph, & Chandran, 2016). It has been suggested by many authors that through the awareness of the systems where transport policies are embedded and by allowing for innovation in the transport sector, sustainable urban transport and mobility policies can be developed (Goldman & Gorham, 2006). The proposed framework can help urban planner and policy makers understand and align their priorities in regard to transport with the local priorities and the local models of assessment and judgements. The framework has the potential to provide the platform, through users/experts collaboration, to develop new transport models that strive towards regional sustainability.

Art-architecture projects and installations are another type of projects that can benefit from this framework. Over the last decades, there has been an observable increase in the number of public art-architecture projects that claim, as a main objective, to disseminate and transfer knowledge regarding climate change and sustainability issues to communities and users – example (Cucuzzella, Goubran, & Kamel, 2017; Goubran, Emond, & Cucuzzella, 2017). The proposed framework, in the context these installation and projects, presents a great potential due to the simpler design program as well as their smaller size and budget. These art-architecture projects and installations can be used to gather regional knowledge regarding specific sustainability topics. The experiential, flexible and commonly ephemeral nature of these project can allow for different iterations to be tested in the same or different regions, and they also allow, with a greater ease, more active regional engagement in the pre-project and post-project phases. By using this framework with art-architecture projects and installations, the regional priorities of communities regarding specific sustainability projects or topics can be identified in an easier way and more specific way: topic specific priorities assessment can be used (relating to food, transport, energy or others). Moreover, the assessment of experts and local users can be attained quicker due to the shorter schedules of these projects. This framework can work as the basis of multi-disciplinary studies that use art-architecture project to explore, develop and adapt policies, tools and standards to specific regions.

**Conclusion**

Within the overall problematic of attaining sustainability in cities, and through the understanding of the direct important effect allocative tools has on the assessment and approaches to sustainability in buildings, this paper aims to investigate the importance of identifying and analyzing the perceptions and priorities gap that exists between regional users and experts. The research paper also explores how this understanding can help redirect the focus towards regional sustainability. The works of various system and complexity thinkers, social theorists, and sustainability theorists is presented and used to highlight that sustainability is made of different coexistent realities that cannot be reduced or approached from within a single existing paradigm. It is found that there is need to break from the current orthodoxy in the subject to move towards a paradigm that allows for an interdisciplinary systems approach to the topic. The work of Collins & Evans (2007), Cucuzzella (2015b) and Trépos (1996) is used to understand the nature of expertise in within the topic sustainability in the built environment. It was found that the current methods and approaches to sustainability are strongly imbedded in a technical realm, and there is a need for developing more inclusive methods that consider the local and regional expertise and realities.

The research proposes a 2-phases (pre and post project) and 2-domains (experts and regional users) for regional sustainability which aims to model complex regional sustainability by exploring the pre-thought and post-thought stages in the experts’ domain, and the pre-done and post-done in the regional users’ domain. By exploring the diagonal cross-alignment of the 4 quadrants, this proposed framework offers a mean to systemically approach “regional objectively” and “regional subjectivity” which exist complex realities – terms which the research coins and defines. The possible application of this framework in a variety of projects types is explored and comments on the benefits of its application are made. The framework use in art-architecture projects and installation was found specifically useful since it can assist these projects in addressing the collective intelligence of regions by using practices such as process consulting (Garrido, 2009).

Although the problematic developed is specific to the topic of sustainability in the built environment, the proposed framework could be potentially used in approaching regional sustainability (or local and other small-scale scopes) in other context (such as business organizations, product development and even industry). The paper specifically helps clarify the theoretical basis for considering the unique sustainability expertise embodied in the users of different regions and highlights its separate and non-conflicting nature with technical expertise. The problematic, conceptual development and framework presented can help and guide other researchers, designers, practitioners, policy maker, or even sustainability experts to reinvasion regional sustainability, and to reorient assessment towards more inclusive and complex modes. This research, through the proposed framework, presents a possibility for developing new modes and models of assessment that are more inclusive, and that are rooted in the complexity of regional objectivity and regional subjectivity.

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