RECONSIDERATION OF *GENIUS LOCI*: RE-GENERATIVE DESIGN APPROACH IN ENVIRONMENTALLY SENSITIVE ARCHITECTURE

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IN ARCHITECTURE

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ABSTRACT

RECONSIDERATION OF *GENIUS LOCI*: RE-GENERATIVE DESIGN APPROACH IN ENVIRONMENTALLY SENSITIVE ARCHITECTURE

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Green building rating systems, such as LEED and BREEAM, were initially developed for assessing the performance of the building designs as end-products. With the passage of time, they have gained such significance that they started to lead the green design practice. However, the inappropriate adaptation of these international rating tools as design guides has resulted in insensitivity towards context, disregard of regional and cultural variations since they have certain limitations preventing them to guide the overall design process. In these terms, there is a substantial need for a shift in green design practice. The purpose of this study is to propose a strategic shift in mindset towards an environmentally sensitive approach by interpreting *genius loci,* 'spirit of the place', as a context-depended understanding of architecture with re-generative design in order to obtain a better established basis for the design process. Re-generation, in this context, is a process based approach and aims revitalizing the environment with co-evolution of humans with natural systems. The study adopts a critical position and includes analytical evaluations which start with literature research and examined further through case studies in order to promote the necessity of mindset shift. After the discussion of

key concepts, a conceptual framework is created to provide guidance for future practice. It is claimed in this thesis that a reconsideration of *genius loci* in accordance with the ideals of re-generative design has the potential to provide solutions based on place-specific understanding for environmentally sensitive architectural practice.

Keywords: Green Buildings, Genius Loci, Regenerative Design

ÖZ

MEKANIN RUHU : ÇEVREYE DUYARLI MİMARLIK YAKLAŞIMINDA CANLANDIRICI TASARIM ANLAYIŞI

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LEED ve BREEAM gibi yeşil bina değerlendirme başlangıçta binaların tasarımını esas alarak performanslarını değerlendirmek amacıyla geliştirilmişlerdir. Zaman içinde kazandıkları önem nedeniyle yeşil tasarım pratiğine yön vermeye başladılar. Fakat, uluslararası geçerliliği olan bu değerlendirme sistemlerinin geliştirilme amaçlarından saparak tasarım kılavuzu olarak kullanılmaya başlanması nedeniyle bağlamdan kopuk, bölgesel ve kültürel farklılıkları gözardı eden binaların ortaya çıkmaya başlamıştır. Her ne kadar olumlu amaçlarla geliştirilmiş olsalar da, bu değerlendirme sistemlerinin tasarım sürecini başından sonuna dek yönlendirmelerini engelleyen kısıtlılıkları bulunmaktadır. Bu açıdan, yeşil tasarım pratiğinde bir dönüşüme önemle ihtiyaç duyulmaktadır. Bu çalışmanın amacı, bağlama dayalı bir yaklaşım olarak *mekanın ruhu* kavramını canlandırıcı tasarımla birarada yorumlayarak çevreye duyarlı mimarlık için tasarım sürecine yön verebilecek, daha sağlam temeller üzerine oturtulmuş, stratejik bir dönüşüm önermektir. Buradaki canlandırıcı tasarım, insan ve doğanın birlikte evrimleşmesiyle yapılı ve doğal çevreyi iyileştirerek tersine dönüşüm sağlamayı hedefleyen, süreç odaklı bir yaklaşımdır. Araştırma için seçilen nicel yöntem,

eleştirel değerlendirmeye ve analize dayalıdır. Tartışmalara altyapı oluşturacak literatür taramasının ardından seçilen örnekler incelenerek kavramsal dönüşümün gerekliliği desteklenmiştir. Çalışmanın son aşamasında tasarım sürecini yönlendirebilecek kavramsal bir çerçeve önerilmiştir. Bu çalışmada *mekanın ruhu* kavramının canlandırıcı tasarımla birlikte yeniden ele alınmasıyla, çevreye duyarlı mimarlık pratiğinde yere özgü tasarım anlayışına dayalı çözümler üretilebileceği öne sürülmüştür.

Anahtar kelimeler: Yeşil Binalar, Mekanın Ruhu, Canlandırıcı Tasarım

To Gülay Emerce,
my mother and best-friend

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CHAPTER 1

INTRODUCTION

1.1.State of art

Environmentally sensitive approach is one of the rising topics of the last few decades. Parallel with the developments in other fields, architectural practice has started to focus on concepts like sustainability and energy-efficiency. Since it has been acknowledged that construction industry is closely related with ecological problems and responsible from a vast amount of resource consumption both directly and indirectly, it has become evidential that design strategies may play an important role easing and even reversing the negative effects of construction industry.

The main issues triggering the emergence of environmentally sensitive approach mainly started with the industrial revolution in the mid-eighteenth century. Together with the technological changes and innovations, there had been a vast increase in the energy consumption. The new industrial system based on mass production and mass consumption fastened the exploitation of natural resources as well as environmental pollution.

Because of the human domination on biosphere and profit-based development models, different parts of Earth's systems have started to collapse. Starting from the 1970s, problems such as oil crisis, depletion of non-renewable natural resources, impairment of ozone layer, global warming, climate change, increases in the population, environmental pollution and degradation, loss of biodiversity and destruction of habitats have lead to an environmental crisis. These

interrelated complex issues threaten not only humans but also all kinds of living entities on earth.

All of these various factors have induced people to consider their overall actions on earth and prompted governments to seek secure sources of energy (Sev, 2009; Brophy & Lewis, 2012). The necessity to take precautions in order to prevent the environmental degradation and preventing nature together with the life quality of humans became evident.

Consequently, an international attempt to provide solutions, environmental movement, has emerged. The environmental movement, also known as the ecological movement, is a diverse scientific, social, and political movement aiming to raise awareness in terms of environmental problems. Starting from the late 19th century, environmental organizations are established concerned with the conservation of nature, wildlife protection, and decreasing the pollution that arose from industrial development and rapid urbanization (Damati, 2013). Various studies and conferences conducted in order to draw attention to environmental issues (Damati, 2013).

Within these ecological considerations, it is possible to mention two major types of environmental approaches, which are *shallow ecology* and *deep ecology*. These two approaches are differentiated and named by Arne Naess, a Norwegian Philosopher and the initiator of deep ecology actions ecology (Naess, 1973).

Shallow ecology is basically human centered and considers human as the ruler of the nature, a force above nature. It is mostly based on anthropocentric environmentalism. It approaches nature in terms the benefits it can provide for humans. Although it is concerned about ecological system, it does not give priority to nature as a living entity, rather it focuses mostly on the welfare of human

population, energy crisis and economic aspects (Naess, 1994). Shallow ecology is therefore considered as a type of intellectual despotism (Yaylı & Celik, 2011).

Deep ecology, on the other hand, is holistic and biocentric. It is has a different philosophical perspective than shallow acology and is considered to be a subset of *radical ecology* actions. It is 'deep' in the sense that it aims to have a deeper understanding of the relationship between the humans and the nature. It claims that human is not above nature, but it is an inseparable part of the nature (Naess, 1994). Not only the health and welfare of human but also diversity in the nature has to be protected according to the new ethics that deep ecology has brought into discussion (Naess, 1994).[1]

The term 'sustainability' has started to gain importance during the debates and actions on providing solutions for environmental problems. Sustainability is defined as 'the capacity of a system to maintain a continuous flow of whatever each part of that system needs for a healthy existence' (Button, 1988, 446). Humans, all living organisms and inorganic matter on earth are parts of the same system. That being the case, the necessity for humans to reconsider their actions and take precautions in order to prevent the collapse of other parts of the system was obvious.

Among these environmental actions one of the keystones is the establishment of the World Commission on Environment and Development (WCED). In 1983, the United Nations established the WCED, an international committee of twenty-two members headed by Dr. Gro Harlem Brundtland.[2] This

[1] Despite there are oppositions of deep ecology stating that it is incomplete and remain incapable of solving some of the sociological problems, it is still valid on its main stance and presuppositions. It was criticized because of lacking a systematic political-social program. However, the discussion platform created by the deep ecology and fact that it opened a road towards future theories and models in the field cannot be disregarded.

[2] Dr. Gro Harlem Brundtland is the Former Prime Minister of Norway. She would be reelected to the Office in 1986. And she had long been an advocate for environmentalism. (Dawey, 2015)

commission, known as Brundlandt Commission, aimed developing strategies for sustainable development and released its seminal report in 1987 (Dawey, 2015).

'Our Common Future', also known as 'Brundtland Report' is important in terms that it specifies the definition of the sustainable development. In the report, sustainable development was defined as 'the development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (WCED, 1990). Another key contribution of Brundtland Report to the concept of sustainable development is the recognition that the many of the issues that the planet was facing were indeed interlocking elements of a single issue of the whole and of the vital need for the active participation of all sectors of society in consultation and decisions relating to sustainable development.

Sustainable architecture could be regarded as the reflection of sustainable development concept on the building industry which is responsible for a major part of the environmental deterioration. The construction industry is not only responsible from the depletion of natural resources but also an important portion of the release of harmful gasses such as carbon dioxide, causing global warming and climate change, disturbance of green areas and habitats.

With this regard, being an important facet of the sustainable development concept, sustainable architecture is defined as,

> 'the overall action of creating environmentally responsive buildings which considers human health and comfort, prioritize the use of renewable resources, making an effective use of energy, water, materials and site, not only in the circumstances they are being built but also through all of their lifespan'.
>
> (Sev, 2009, 31)

Within the considerations of this study, sustainable architecture could be considered as an environmentally aware way of building, keeping in mind that not

each human being but also all kinds of living entities have the right to pursue their lives in a healthy and suitable way. With these terms, sustainable architecture should not be treated as a separate kind of architectural approach. It is an integral part of ecological thinking and all the environmental actions. Sustainable architecture is based on the necessity that the way people inhabit the world, including all the architecture and construction practice, must be sustainable.

Sustainable architecture is quite a broad term and includes various types of practice including green buildings, adaptive, restorative and regenerative buildings. Green buildings are the most widely applied type among these. They aim decreasing the harmful effects of building industry while reducing the resource use by using both active and passive design strategies. Actually, these strategies are nothing less than already existing design principles gaining more importance because of the current conditions, evolving by the help of technological innovations and thus being more efficiently used.

Although sustainability was not a totally new concept, the issue of ecological design for architects and other authorities started to became more popular especially at the end of 20th century because of the reasons mentioned above.[3] For this reason, it would be more accurate to approach green principles as elaborated versions of the environmentally sensitive design understanding and one of the necessary parts of the design requirements.

In this field, there has been a vast debate on the necessity and methodology on integrating a wide range of issues such as energy demand, resource depletion, environmental impacts into construction industry. Following the ecological movements and developments in the sustainable architectural field, environmental assessment of buildings has also become a significant aspect included in the field.

[3] du Plessis (2012, p.8) states that admonishments to take only what is needed from nature can be found as far back as the Upanishads while the origins of sustainable resource use have been traced back to medieval German forestry practices.

During this methodology debate, foundation of Building Research Establishment (BRE) was an important step accelerating ecological approaches in architectural practice since it is the initiator of first green building rating system, BREEAM in 1990 (BRE, 2015). It is followed by the emergence of LEED, CASBEE, SBTool (formerly GBTool) and various green building rating tools, which are explained in more detail in the next chapter.

These green building rating systems aimed at providing a systematic way of assessing the sustainability of the buildings in order to raise ecological awareness among building owners and decision makers. They are are notably positive attempts considering their main purpose is basically providing efficient use of resources, saving energy and decreasing the harmful effects of buildings to the environment. They have been successful in terms of raising awareness of environmental responsibility among not only the architects but also the whole community.

1.2. Problem definition

Green building rating systems, such as LEED and BREEAM, were initially developed for assessing the performance of the building designs as end-products. In the process of time, they have gained such significance that they started to lead the green design practice. However, the inappropriate adaptation of these international rating tools as design guides has resulted in insensitivity towards context, disregarding regional and cultural variations since they have certain limitations preventing them to guide the overall design process.

Although they are beneficial for supporting the integrated design process, their being treated as design guides resulted in problems for current green design practice. The main problem of this system is that it creates buildings which are insensitive towards their context and the specific place that they are constructed. Because the current green building practice is based on this flawed system, the

buildings occurring as a result of this system are usually over-standardized, lacking a place-specific approach in their designs and constructions. The current green building practice, based on the inappropriate adaptation of ready-made check-list systems as guides are based on a mechanistic worldview, resulting in fragmented solutions.

In these terms, there is a substantial need for a visionary shift in green design practice. Environmentally sensitive architectural practice must include context-depended understanding which embraces the ideas like locality, place, in situ and pays more attention to the user perception.

A critical evaluation and interpretation of the context-based approach in these terms is the main missing point in current practice. A holistic and integrated process is required in order to obtain buildings creating dialogue with their surroundings, respecting local values as well as taking into consideration the phenomenological aspects of architecture.

With this regard, uniqueness and specificity should be promoted against over-standardization. Social dimensions of sustainable development shall also be included in the design process. There is a need for a more sophisticated and operational framework which is based on a collaborative, integrated process and capable of guiding the environmentally sensitive architectural practice in order to extend the limits of today's common understanding of green design.

1.3. Aim of the thesis

The purpose of this study is to offer a strategic mindset shift in green design practice from the label oriented approach towards a more comprehensive, place-specific approach, which is able to adopt regional values. It is claimed in this thesis that a reconsideration of *genius loci* within the ideals of re-generative design has

the potential to provide solutions based on place-specific understanding for environmentally sensitive architectural practice

This study criticizes mainstream green design practice shaped by rating systems because of its foundational basis on an inappropriate mechanistic and reductionist worldview which resulted disregarding the context and specificity of places. Since the problem occurs mainly from the adoption of rating tools as guides, creating a better established conceptual framework for guiding the process is the main aim of this study.

It is proposed that *genius loci*, 'spirit of the place', should be regarded as the key and emphasized in the design process in order to accentuate contextuality and specific dynamics of different projects. Since the main missing chain of the current green design practice is the sensitivity towards context, a reconsideration of *genius loci* will make the most important contribution for solving the problems in the field. However, the concept of *genius loci* cannot be integrated to the existing green design paradigm since it is already based on a problematic system.

Regenerative design, which is based on a holistic and organic worldview, with this respect, is a process-oriented approach aiming to integrate human-nature relationship. It has the capability to act as a catalyst where *genius loci* could successfully be integrated to the ecological architectural practice. Therefore, the study proposes that a shift from green to regenerative design is required in order to successfully integrate the idea of *genius loci* to the environmentally sensitive practice. It aims to create a conceptual framework to guide the integrated design process of environmentally sensitive buildings.

This study focuses on the interpretation of *genius loci* with regenerative design in order to obtain a well established basis for the continuation of the practice. The focus is given to the ways that how *genius loci* and regenerative design are

capable of creating a new strategic mindset shift and evolving together in order to provide guidance for the future practices in the field.

1.4. Methodology of the thesis

This study adopts a qualitative methodology which is analytical and evaluative. Critical evaluation of green building rating systems is followed by an analytical explanation of the main concepts, *genius loci* and regenerative design. These two concepts are first examined in different chapters and then interpreted together. The case studies are examined at the end of each chapter in order to support the main argument. The evaluations are used in order to create a comprehensive framework.

1.5. Structure and boundary of the thesis

The study starts with literature research on related topics for the basis of discussion. After the introduction, in the second chapter, green building practice and rating systems such as LEED and BREEAM are explained. In the light of this information, limitations of green building rating systems are discussed. A selected case study, Gordion Shopping Mall in Ankara is analyzed with regards to these critical aspects. At the end of the chapter, a critical evaluation of the overall green building design practice of today is made in order to stress the necessity of a conceptual shift to a more comprehensive, context-depended understanding of architecture.

In the third chapter, the first key element composing the suggested conceptual shift, *genius loci* is described. This chapter is a reconsideration of the *genius loci* in the current conditions of environmentally sensitive practice in architecture. It is important in that it promotes the context-depended, phenomenological understanding of architecture comprehensively. After the main

descriptions, two layers of *genius loci* are introduced in order to make the concept more explicit and easily applicable for the frameworks. Homan context and natural-ecological context are inseparable layers of *genius loci* and includes sub-categories within themselves. At the end of the chapter, another case study, Dominus Vinery is examined with regards to these two layers and the ideals of *genius loci*.

In the fourth chapter, regenerative design is described and introduced as a catalyst for the framework to be created. Regenerative paradigm is compared with todays green design paradigm in terms of their appropriateness to evolve together with the *genius loci* in order to promote place-specific understanding. At the end of the chapter, VanDusen Botanical Garden Visitor Center is analyzed with regards to the principles of regenerative design.

In the fifth chapter, a new conceptual framework as a foundational basis is offered by using the descriptions and analyzes about *genius loci* and regenerative design, in order to promote the necessary shift from points-chasing system based on the green building rating tools to a more place-specific, holistic understanding of architecture.

In the last chapter, the discussions carried through the thesis is concluded. The necessity to approach ecological problems from a broader perspective is emphasized.

This study could be accepted as a critical evaluation of current green design paradigm as well as a contribution to the studies on the field of environmentally sensitive design. It supports design approaches in architectural practical studies and is open to further developments.

CHAPTER 2

CURRENT ENVIRONMENTALLY SENSITIVE DESIGN PRACTICE IN ARCHITECTURE AND ITS PROBLEMS

2.1. Literature Review of Green Design and Rating Systems

2.1.1. Green buildings

As briefly described in the introduction, sustainability concept has emerged in the last decades as a result of rising environmental problems including oil crisis, depletion of non-renewable natural resources, impairment of ozone layer, global warming, climate change, increases in the population, environmental pollution and degradation, loss of biodiversity and destruction of habitats.

In time, humans recognized that they need to reorganize their overall actions on earth and accordingly started to take precautions. Sustainable development and sustainable architecture has occurred during this process. Sustainable architecture is the reflections of sustainability concepts on architectural and construction field, which is responsible from a vast amount of resource consumption and environmental pollution on earth.

It was explained that sustainable architecture is an environmentally aware way of building and it should not be treated as a separate kind of architectural approach. It is an integral part of ecological thinking and all the environmental actions. The main principle of sustainable architecture is to controlling human

actions on earth in order to create the chance for the future generations and natural systems to pursue their lives in a healthy manner.

The terms of ‘sustainable architecture’ and ‘green building’ are usually considered referring to the same practice. Although being extensively interrelated, there is a certain distinction between these two. In fact, being an essential part of sustainable architecture, green building practice is only a subset of it. Sustainable architecture is a much wider spectrum containing green buildings as well as net-zero, net-positive, restorative and regenerative buildings. Because the green buildings are implemented most widely amongst other approaches in ecological architecture today, the discussion is carried on green buildings.

Green design is defined as the practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a building's life-cycle from siting to design, construction, operation, maintenance, renovation and deconstruction (EPA, 2014). This practice expands and complements the classical building design concerns of economy, utility, durability, and comfort (EPA, 2014).

Green building is a term simply used for buildings which reduces resource and energy use as well as other negative impacts of the buildings to the environment. It is an environmentally sensitive design product usually created with ecological and economical concerns. Green buildings satisfy the reduction of the negative impacts of the building industry by passive and active design strategies, such as efficient use of resources, land, and materials, taking into consideration the health of users and reducing pollution caused from the building.

Most common design strategies developed for green buildings include passive strategies such as orientation and energy-efficient design for heating and cooling, insulation methods, green roofs, natural lighting, natural ventilation as well

as active strategies such as use of photovoltaic panels or wind turbines for electricity production, solar cells for obtaining hot water, rainwater harvesting systems, greywater and blackwater treatment, and waste treatment.

Even though the terms like 'sustainable architecture', 'green buildings' 'ecological design', 'passive design' and 'solar architecture' have appeared and started to be commonly used at the end of the 20th century, the main principles behind these terms are not totally new to the architectural field. Builders and architects were applying environmentally suitable principles since the beginning of architectural practice. They used strategies such as natural ventilation, solar oriented facades or designing in harmony with topography. Therefore, it would not be appropriate to consider them having brought a dramatic shift to the practice.

Actually, these terms are nothing less than already existing design principles gaining more importance because of the current conditions, evolving by the help of technological developments and thus becoming more efficient. For this reason, it would be more accurate to approach green principles as a developed version of the environmentally sensitive design understanding and one of the necessary parts of the design requirements.

2.1.2. Green building rating systems

Following the ecological movements and developments in the sustainable architectural field, environmental assessment of buildings has become a significant aspect included in the field. Starting from the 1990s, various building assessment strategies and rating tools have emerged. In the process of time, these accreditations, which initially emerged to promote green buildings, have become so popular that they have started to give direction to the green design practices.[4]

[4] Cole (2012b) discusses the emergence and evolution of green building rating tools in detail.

Although having a ‘green certificate’ was voluntary for building owners at the beginning of their emergence, recently these certification systems have moved beyond voluntary market place. Becoming a part of the government policy in various countries, having a green certificate is a prerequisite for many building types in many countries, and Turkey is no exception. To illustrate, LEED certificate has become obligatory in Turkey for the healthcare buildings having at least 200 beds. UNDP projects also seek for green certificates including the buildings to be constructed in Turkey. Similarly, UK government has mandated departments to complete BREEAM assessment of all new built and major refurbishment projects with regard to public projects (OGC, 2008). US government also requires some of the public buildings as well as embassy buildings being built in foreign countries to have LEED certificate as well. All public building developments in Hong Kong must also seek BEAM Plus certification (HK-BEAM Society, 2005). Likewise, CASBEE is required in Japan and ESGB in China (Lee, 2013).

Due to the reasons mentioned above, it is a fact that these accreditations have gained internationally significance. Some of which are more widely used than the others, the most popular green building rating systems the country they were originated are listed in Table 1 (Lee 2013; Vierra, 2014; Ecobuild, 2014).

These green building certification systems have many common points as well as differences. Among all the green building rating schemes developed in different parts of the world, LEED and BREEAM are evidently the most widely recognized ones (USGBC, 2014; BRE, 2011).

In this part of the study, a brief information about the most commonly applied evaluation systems will be introduced. The reason for focusing rather to the most widely recognized systems is to frame the discussion and to give legible examples in order to clarify the main point.

Table 1: List of the most widely used green building rating systems and their countries of origin

BEAM Plus	Hong Kong
BEPAC	Canada
BREEAM	UK
CASBEE	Japan
DGNB	Germany
ESGB	China
Green Globes	UK
Green Mark	Singapore
Green Star	Australia
LBC	US
LEED	US
SBTool	International

2.1.2.1. BREEAM

BREEAM is the first green building rating system developed in the UK in 1990 by BRE, Building Research Environment (BREEAM, 2011)[5]. It is an internationally recognized environmental assessment tool providing standards for sustainable building design and environmental performance (Haroglu, 2013; Vierra, 2014). Primarily it was established in order to assessing performance of non-domestic buildings in the UK. At the moment, it is being used for commercial buildings, industrial buildings and large scale residential buildings.

[5] The Building Research Environment is a government establishment in UK, founded in 1921. Its aim was to work on research, consultancy and testing in the construction sector. It is renamed as BRE Global in 2006 since it has started to offer services worldwide (https://www.bre.co.uk/).

BREEAM has nine categories to evaluate environmental performance of buildings, which are management, health and well being, energy, transport, water, materials, waste, land use and ecology, and pollution. The credits of BREEAM are awarded according to these nine categories and an overall credit is obtained. A licenced BREEAM assessor is appointed in order to decide how many credits a building gets from the different point scoring categories. The assessor makes the evaluation according to the documents indicating energy efficiency and other sustainability aspects of the building defined in the BREEAM manual.[6]

BREEAM has adopted a two-stage assessment process in order to include built scenario in addition to the predicted performance of the building. At the end of the evaluation process, the buildings are ranked on a scale of outstanding, excellent, very good, good and unclassified according to their overall credit (BRE, 2011).

With 425.000 certified and 2 million registered buildings, it is one of the most widely recognized green building rating systems in the world (BRE, 2015). Although it was created in UK originally, there are now international versions of BREEAM with modifications made on the initial scheme.[7] It has also been used as a template for the creation of other tools in other parts of the world such as the GreenStar in Australia and HK-BEAM in Hong Kong (Ding, 2008).

[6] A summary of BREEAM UK New Construction Technical Manual (2014) showing the table of contents is provided in the Appendix A in order to obtain better idea about sustainability strategies that BREEAM supports under each category.

[7] BREEAM has multiple versions for international use, including BREEAM International, BREEAM DE (Germany), BREEAM NL (Netherlands), BREEAM NOR (Norway), BREEAM ES (Spain), BREEAM SE (Sweden), BREEAM AT (Austria). See more details at http://www.breeam.org

2.1.2.2. LEED

LEED was developed in 2000 by the US Green Building Council (USGBC, 2015)[8]. Although it was initiated after BREEAM , today it is the most widely recognized building rating scheme, being used in more than 40 countries (USGBC, 2015).

LEED is also applicable not only for new constructions but also for different types of buildings. Existing categories for LEED applicants are LEED Building Design and construction, LEED Interior design and construction, LEED Building operations and maintenance, LEED neighborhood development and LEED Homes (USGBC, 2014).

Certification system of LEED includes 6 main categories from which buildings may obtain up to 100 points, which are Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation in Design. Within each of the credit categories, there are specific prerequisites projects must satisfy and a variety of credits projects can pursue to earn points (USGBC, 2014). It is also possible to pick up 10 'bonus' points in addition to the 100 point to be collected from those 6 categories. 4 of this 10 point is for Regional Priority Credits and 6 point is for Innovation in Design.[9] The rating degrees based on the overall points obtained are platinum, gold, silver and certificated.

[8] The US Green Building Council was founded in 1993. After 15 years, a critical development was the creation of the Green Building Certification Institute (GBCI) in 2008. It became responsible for the administration of LEED certification and credentials systems, permitting the USGBC to focus on developing and refining the LEED standards. This contrasts with BREEAM certifications wherein the assessors operate under a BREEAM International Licence and submit assessments to BRE for quality checks (Cole & Valdebenito, 2013). See more details at www.usgbc.org

[9] A summary of LEED v4 for Design and Construction Manual including table of contents is provided in Appendix B. There is also a check-list for LEED, illustrating the credits that could be obtained from each category, as well as the prerequisites.

The assessment process of LEED is slightly different than BREEAM. There is no assessor appointed to make the evaluation. Rather, the necessary design and performance documents of the building is submitted online to LEED. The design team may or may not search for a LEED associate in order to get support from them during the design process. However, since the application and the certification process is complicated, LEED associates are usually included in the projects.

LEED also adopts a two-stage assessment process. It requires the submission of the bills and other energy efficiency documents for 5 years after occupancy. However, these documents do not cause any changes in the certification level of the building (Ecobuild, 2014).

2.1.2.3. Other evaluation tools

Other than BREEAM and LEED, there are other important green building evaluation tools which are worth describing in this part of the study such as CASBEE, SBTOOL and LBC. Although not as widely recognized as the previous two yet, these tools are also noteworthy because of the evaluation systems they have developed.

SBTool (Sustainable Building Tool) is an international collaboration framework, developed by International Inıtiative for Sustainable Built Environment (iiSBE). It is a framework operating at excel and aimed to be a comprehensive evaluation method that can be used by different regions with the adjustment of regional variations (iiSBE, 2015). It takes into account region-specific and site-specific context factors, and these are used to switch off or reduce certain weights (iiSBE, 2015). The main difference of SBTool from the other green building rating systems is that its weighting can be partly modified by authorized third parties according to regional variations.

CASBEE (Comprehensive Assessment System for Building Environmental Efficiency) is developed by Institute for Building Environment and Energy Conservation (IBEC) and takes into consideration issues specific to Japan and Asia. It differs from the other rating systems by its scoring system based calculating environmental implications according to a formula which compares building performance to the building environmental loadings (Cole, 2005). In CASBEE, weighting coefficients may be modified to suit local conditions such as climate or to reflect the prioritized policies (IBEC, 2014). It distinguishes between the Environmental Loading (resource use and ecological impacts) and Environmental Quality and Performance (indoor environmental quality and amenities).

LBC (Living Building Challenge) is another rating system for buildings which could be regarded as more rigorous than the others. It requires the project to not only document but also realize the performance of the building as well as the carbon emissions related to the building material production and extraction as well as the construction of the building and the landscape (LBC, 2014). Therefore the certification can be obtained after 12 months of operating process for the building. It is more comprehensive and has different evaluation criteria such as aesthetics aspects of the building design.

2.2. A Critical Evaluation of the Current Practice

Green building rating systems are notably positive attempts considering their main purpose is basically providing efficient use of resources, saving energy and decreasing the harmful effects of buildings to the environment. They aim to raise awareness of environmental responsibility among not only the architects and stakeholders but also the whole community. They can be considered as successful in that they are alerting building owners and professionals to the importance of environmental issues in construction. These rating systems enhance the environmental awareness of building practices (Ding, 2008).

Moreover, green building rating systems provide a systematic way of evaluating the performance of buildings across a broad range of environmental considerations (Kohler, 1999; Cole, 2000). They are regularly updated to improve themselves for better environmental performance and to ensure they set agenda on building sustainability.

Green building rating tools are important steps in terms of providing international standards for sustainability performance of the buildings. Today, the notion 'green' has become an international business sector having a high marketing value. The certification of green buildings is now a major business.[10]

On the other hand, there are certain flaws of the current green design practice since it is mainly based on these rating systems. Although these accreditations had occurred as assessment tools for evaluating the sustainability of finished projects, they have started to be used as design guides and consequently give direction to the green design approaches in the field. Because they are the main agenda that current green design is mostly based on today, there are some limitations and restrictions of this inappropriate collapse.

In these terms, the limitations and of these tools preventing them to be used as process guides as well as their overall reflection to the architectural practice will be examined in this part of the study.

2.2.1. Limitations of the green building rating systems

In this part of the study, limitations of most widely recognized green building rating systems will be analyzed. These limitations mainly occur when the

[10] This business includes certification process, licensing of the systems, training and education, and the accrediting of building design professionals.

certification systems are treated as the utmost goals by decision makers instead of supporting tools.

The most critical points are gathered under a list of items in order to make the discussion more explicit (Table 1). However, it should be noted that all of the aspects are closely linked and interrelated with each other.

Table 2: Major limitations of green building rating systems

1.	Over-standardization and lack of flexibility
2.	Check-list based quantitative structure
3.	Lack of sensitivity towards regional variations and specificity
4.	Narrow scope, disregarding the social and cultural aspects
5.	Focusing on end-product rather than guiding the process
6.	Energy performance criteria based on predictions
7.	Imbalance in the scoring systems
8.	Insufficiency for urban scale

2.2.1.1. Over-standardization and lack of flexibility

Green building rating tools are based on a certain degree of simplification in order to obtain an objective measurement having well-defined boundaries. Also, they needed to adopt particular standards based on the existing applications. However, this simplification may cause over-standardization of the architectural designs. As a result of this standardization, the schemas may not be flexible enough to apply for projects in specific contexts and conditions.

When these standard tools are treated as pure design guides, they result in projects lacking sensitivity towards their surroundings because of adopting ready-

made standard solutions. With this respect, it is argued that the minimal list of indicators resulting form this simplification attempt leads to the neglect of particular aspects of the building under investigation, the region, climate or culture (Lützkendorf & Lorenz, 2006).

Studies have revealed that green building rating systems may possess design solutions instead of putting emphasis on the underlying reasons for a particular solution. Actually, the success of the rating tools is mostly depended on the perspective of the design team. To give an example, researches examining the impact of BREEM assessment process on the design of buildings in UK has proved that BREEAM may support the design process when it is used by experienced design teams (Haroglu, 2013). However, it may also limit the design in by drawing the attention to achieving BREEAM credits rather than the building in its entirety (Haroglu, 2013). While some of the teams expressed BREEAM was helpful during the integrated design process, some of the team members of other projects claimed that these tools are 'setting the design in stone' involved in the design processes of buildings having green certificates (Haroglu, 2013, 18).

LEED is no exception to this situation. Indeed, studies comparing different rating tools have revealed that LEED, the most widely recognized green building rating system, is the most stringent and inflexible one at the same time (Lee, 2013).

These simplified schemas tend to reinforce existing building types and practices. Since they have separate and discrete evaluation categories of technical solutions (see Appendix A and B), they tend to courage these standard technical solutions to different projects aiming to obtain certificate.

2.2.1.2. Check-list based quantitative structure

Most of the green building rating systems are based on check-lists and quantitative evaluation (see Appendix A and B). However, most of the environmental problems depend mostly on qualitative data, which cannot be measured and evaluated using market-based approaches within the existing environmental framework (Ding, 2008). Also, contextual considerations, such as cultural aspects, local know-how, architectural heritage are mostly qualitative aspects.

With these terms, a growing number of authorities challenge the adequacy of green building rating tools with their primarily technical focus and reliance on generic frameworks (du Plessis & Cole, 2011; Kaatz, Root, Bowen, & Hill, 2006). They can only be evaluated on a 'feature-specific' basis (Cole, 1998).

From a broader perspective, the formulaic approach of check-lists for sustainability is not sophisticated enough in order to include other dynamics of the architecture and the city. The discrete performance criteria of check-list based schemes may lead to fragmentation both in the building and urban scale without other considerations in mind. Therefore, it is important that the check-lists and quantitative evaluation needs to be supported with qualitative considerations and evaluations in order to create positive links within the context of the projects.

2.2.1.3. Lack of sensitivity towards regional variations and specificity

It is important to remember that each of today's most widely recognized green building rating schemas were initially created for one specific country such as BREEAM for UK and LEED for US. In progress of time, they have become so widespread that they are also adopted by other countries as well. Cole calls this

situation as 'the exchange and borrowing of methods'(2015) [11]. Although there are advantages of this exchange, it brings significant disadvantages as well.

Since each of them were developed for a specific country, it is difficult to adopt differences of other regions including government policies, social and economical conditions as well as resources and climatic differences. This results in lack of sensitivity towards regional variations and specific contexts. [12] Although they aim to overcome these problems in the updates, they still lack a certain degree of social-ecological engagement in their current versions.

LEED and BREEAM have adopted the standards of the countries they were originally created. For example, most of the definitions and the regulations of LEED are taken from EPA (United States Environmental Protection Agency) and FEMA (Federal Emergency Managment Agency) and the energy efficiency requirements are dominated by ASHRAE (Ecobuild, 2014; USGBC, 2015). Similarly, BREEAM adopts UK system, basing its energy efficiency requirements on SBEM, which is developed by BRE and specifically for UK under the norms and regulations of government (BRE, 2015). Although they are being internationally used, they still impose these standards to other countries as well.

The addition of RPC (Regional Priority Credits) to LEED is promising for addressing regional issues. However, needs to be further developed in order to overcome the shortcomings of the system. To illustrate, in the LEED rating system Turkey is considered as one homogenous climatic zone as an arid middle east country (Ecobuild, 2014). Because of this reason, LEED is prioritizing water-

[11] Before LEED and BREEAM were as internationally widespread as they are today, Cole warned that the inappropriate cross-cultural importation of specific technical strategies may prove potentially detrimental to environmental progress. Since most of the systems initially carry the values and priorities of their origin not all of the environmental criteria can be transformed to other regions and contexts (Cole, 2005).

[12] Cole & Valdebenito (2013) examines their international use with particular attention paid to the relationship between their use and the existence of national systems developed in the countries of application using data from six specific countries.

saving strategies in all the regions of Turkey. However, Turkey is composed of seven seven regions and there are significant differences in climatic conditions from one regions to another (Şensoy, Demircan, Ulupınar, Balta, n.d.). Therefore, different design strategies has to be addressed and priorityzed for each of these regions.

To give another example, LEED gives one point for using a green roof in the project in any case, without taking into consideration where the building is located. Indeed, a supported design strategy like this requires a careful formulization derived from detailed regional and climatic analysis. It is certain that green roofs are intrinsically of great benefit. However, the special circumstances of the project such as the annual rainfall, other water resources, noise levels, need for plantations and wildlife requirements should be examined in order to make an evaluation for the use of green roof.

Though not as widely recognized as LEED and BREEAM internationally, there are some green building rating systems such as SBTool and CASBEE which were designed to address local issues. However, these tools also have other limits for applicability.[13]

[13] Although SBTool is specifically designed for considering cultural values, building traditions and technologies specific to the place, and usually considered as the most flexible tool amongst others, it still has some restrictions and has not adapted to a lot of regions yet (Sharifi & Murayama, 2011). It is also criticized because of its complexity and having various criteria which are out of designers' control such as the individual country teams established scoring weights subjectively when evaluating their buildings (Sharifi & Murayama, 2013; (Crawley & Aho, 1999). Also it is stated that most of the users find it difficult to use because of the complexity of the framework (Ding, Crawley & Aho, 1999). It is argued that the approach of the SBTool has lead to a very large and complex system causing difficulties and frustration for over-stretched assessors rather than a global assessment method as intended (Curwell et al., 1999 cited in Ding, 2008). Developed specifically for Asia, CASBEE is also criticized because of lacking a comprehensive evaluation. Studies indicated that CASBEE has the narrowest scope among other assessment tools it was compared.(Lee, 2013).

2.2.1.4. Narrow scope, disregarding the social and cultural dimensions

Another limitation of the green building rating systems is that they frame a limited definition of environmentally responsible architectural practice. Since their main purpose is to evaluate the energy-efficiency, they mostly focus on these aspects. However, a comprehensive guide for a design process requires to pay emphasis on qualities of architecture as well as many of the economic and social aspects.

Studies on green building rating systems proved that they have a limited perspective of social impacts of buildings with giving the largest proportion of credits to the energy efficiency (Sharifi & Murayama, 2013). The current scheme of these rating systems grants credits for a small number of social impacts (Lützkendorf & Lorenz ; Haroglu, 2013; Cole, 2012a). They mostly pay attention to the protection of resources. However, not only preservation of resources but also social and cultural values is of vital importance in terms of sustainability.

Since they were not developed as architectural guides, even the most widely recognized rating systems usually neglect local architecture, culture or techniques in their evaluation systems. When the schema of these accreditations are examined, it could be seen that there are no evaluation criteria with regard to these crucial aspects of the context (see Appendix A and B). These systems concentrate the performance of the buildings as a separate entity.

Assessment methods such as LEED and BREEAM are single-dimensional while multi-facet building sustainability needs a multi-dimensional approach (Ding, 2008). They are not paying enough attention to the socio-economic impacts of building industry and mostly focusing on energy performances from a narrower perspective. Moreover, neither BREEAM nor LEED include consideration of financial aspects in their evaluation framework (Sharifi & Murayama, 2013).

Considering context is a whole together with these aspects, it is evident that green building rating systems may lead neglecting social aspects of the context unless they are supported as other design frameworks.

2.2.1.5. Focusing on end-product rather than guiding the process

Green building accreditations such as LEED and BREEAM are initially occurred as assessment tools evaluating the finished project in terms of its environmental performance, as repeated before. Through time they are started to be used as design tools, although they were not specifically designed for this. Yet, they mostly focus on evaluating rather than leading the process because their primary focus is technical solutions and energy performance of the buildings.

It is necessary to make a distinction between the *product* and the *process*. Green building rating systems 'evaluate' the *product* and 'may support' the *process*. But they cannot 'lead' the process. It is commonly criticized that the assessment process is usually carried out when the design of the project is almost finished (Crawley & Aho, 1999; Soebarto & Williamson, 2001). However, environmentally sensitive frameworks and guidance must be introduced as early as possible in the process.

Designing these kind of environmentally sensitive and energy efficient buildings requires an inter-disciplinary integrated design process. It is commonly argued that sustainable construction requires greater disciplinary specialization and functional dependence between components than traditional construction, which in turn depends on greater integration between project team members (Lützkendorf & Lorenz, 2011; Schweber & Haroglu, 2014). Decision makers and stakeholders shall exchange views from the beginning of the initial design to the end of the construction.

There are attempts to strengthen integrated design process in these rating systems. In the most recent version of LEED, v4 2014, there is a separate scoring category for integrated design process (Ecobuild, 2014). It supports the inter-disciplinary collaboration through overall process. However, in the current condition, it lacks objective measurement based on evidences for evaluating how effectively it was pursued.

Because of these reasons, basic principles of environmentally sensitive design cannot always be fully integrated to the designs when they are based on the accreditations. These rating and scoring systems may actually discourage solutions that build on synergies and symbiosis, canalizes the designers and decision makers to a 'hot-plug' system which is composed of superficial add-on elements, (Birkeland, 2007; Plaut et al., 2012). Because, as Cole states, building owners may commit their designers to achieving a high-performance score using a specific assessment method, resulting in 'points-chasing' as an unfortunate, but understandable, consequence (Cole, 2005).

2.2.1.6. Energy performance criteria based on predictions

Within the evaluation process of green building rating systems, the evaluations are mostly based on energy simulation models and calculations rather than the actual post-occupancy scenario. Consequently, these systems are not measuring *how buildings actually perform* but rather *how they are predicted to perform* (Ecobuild, 2014; BREEAM, 2011).

Although it is quite beneficial trying to estimate energy-efficiency of the building during the design phase and making constant modifications accordingly, these pre-occupancy predictions and estimations are not always consistent with the actual energy performance of the certified buildings. While the energy simulations

can sometimes achieve quite realistic results, they may also give wrong impressions because they cannot fully predict variables related with behavioral patterns of users.

Although they aim saving energy and efficient use of resources, conducted researches have proved that not all the certified buildings are having better performance than the others (Newsham, Mancini & Bird, 2009; Scofield, 2009). Studies have revealed that usually there is no correlation between the obtained credits of the building and the overall energy performance (Newsham, et. al. 2009). Indeed, these 'planned-to-be-green' certified buildings may even have more energy consumption than the other buildings (Scofield, 2009).

Although LEED and BREEAM have adopted a two-stage evaluation process in their current versions, as explained before, it still insufficient in terms of taking into consideration the post-occupancy performance of the buildings for the certification level.

LBC is quite promising with this regard since it requires the documentation of 1-year post-occupancy performance of the buildings applied for the certificate (LBC, 2014). However, it is not as widely recognized as LEED or BREEAM yet, being quite new compared to other accreditations and underdeveloped.

2.2.1.7. Imbalance in the scoring systems

The weighting system is one of the key elements addressing regional variations in rating green buildings. Although LEED and BREEAM are updated and developed constantly, there are still critical issues about their point scoring systems.

LEED uses a simple additive approach (1 for 1) with all criteria being weighted equally. The points to obtain from different categories in order to get the

certificate are almost equal, even though some have far important environmental or economic benefits (USGBC, 2014). With this scoring system, there is an imbalance between the separate categories to be evaluated.[14] It is also argued that achieving a BREEAM 'excellent' rating does not necessarily guarantee a good environmental performance at the post-occupancy stage since a low score received in one category can be offset by higher scores in other categories (Sawyer et al., 2008). Because of this system, green building rating tools are encouraging decision makers to 'game' the system rather than creating synergies for providing comprehensive solutions (Quirk, 2012).

2.2.1.8. Insufficiency for urban scale

It is becoming evident that focusing on improving the performance of an individual building does not necessarily benefit its surrounding. Relevance of the problem in terms of urban scale should also be addressed briefly since the relationship of urban environmental problems with the architectural design and performance is another important issue.

In these terms, versions of green building accreditations for urban developments has started to occur such as LEED Neighbourhood Development; BREEAM Communities; CASBEE for Urban Design. These neighborhood sustainability assessment tools aim to assess the performance beyond a single building. They are promising attempts to include social dimensions and urban scale to the green buildings.

[14] To illustrate, a LEED certificated building got one point for spending en extra 1.3 million USD for a heat recovery system that will save about 500.000 USD per year for energy costs (Schendler, 2005). The same building, ironically, got also one point for installing a 395 USD bicycle rack to the building which does not necessarily contribute much to the building (Schendler, 2005). This 'bicycle rack point' is commonly criticized because of being an irrelevant and weak evaluation criterion (Hasol-Ertekin, 2012). In the newest version of LEED, 2014, the evaluation criteria including bicycle racks has changed and required the existence of bicycle roads in the city connected with the building. This update, however, can also be criticized because of depending on criteria beyond the control of the project's decision team.

However, there are some limitations and ambiguities in the weighting, scoring, and rating; there is still lack of consideration for local adaptability and participation. Studies have revealed that most of these tools are not performing well enough in terms of social, economic and institutional aspects of sustainability. (Sharifi & Murayama, 2013). Also, important issues such as affordable housing, local economy and jobs, inclusive communities are not still adequately addressed in the rating tools (Sharifi & Murayama, 2013). LEED-ND almost applies the same weightings and benchmarks and the developer can only acquire four additional credits for addressing geographically-specific environmental, social equity, or public health priorities. Although BREEAM applies regional coefficients in its rating system, it is criticized that benchmarks are not locally referenced and issue of development type is also not considered providing solutions to individual credits (Sharifi & Murayama, 2013).

2.2.2. Case study: Gordion Shopping Mall

In this part, Gordion Shopping Mall is examined with regard to the the limitations discussed above. This building is a critical example in terms of being a built example which focused on having a green certificate from the beginning of the project.

Designed by Spanish Chapmen Taylor Architects and Netherlander REDEVCOncept, Gordion shopping mall is one of the first BREEAM certified buildings in Turkey. Completed in 2009 in Ankara, it has 55.000 m2 gross living area.

The building is certified with ‘BREEAM excellent’. 18% of the building’s energy needs were planned to be obtained by co-generation systems and the system efficiency is maximized by using waste heating. The system uses natural gas in order to generate electricity and the heat produced during this process is used for

heating the building (Mutdoğan, 2013a). Also being located close to the public transportation, it has significant carbon emission reduction. It was claimed to be 'the greenest shopping mall of Turkey' by the investors.

However, it is possible to read the limitations of green design practice when it mostly is based on obtaining certificates. First of all, there is a discontinuity between the design phase and the construction phase. The green strategies planned during the design phase could not realized during construction phase, such as photovoltaic panels on the rooftop and partial greening on the facades (Mutdoğan, 2013b). The electricity production of the building is made using my natural gas, which is a non-renewable source unlike wind or solar energy. Also it is stated that the efficiency estimated at the pre-occupancy phase could not be satisfied at the post-occupancy phase because of the unexpected climatic conditions and the co-generation system could not work with full performance (Mutdoğan, 2013b). These facts reveal that a building could easily get a BREEAM excellent rating even though the estimated scenario cannot be realized because of the energy performance criteria of the accreditations are mostly based on predictions, as discussed in the item 6.

The most critical point about Gordion shopping mall is that it has a weak dialogue with its surrounding. Comparing it with the existing buildings when it was constructed, its scale seems highly problematic. Located next to double-story houses with gardens, the irrelevant scale of this building gives the sense as if it has emerged out of blue (Figure 1). Rising just a few meters beyond the balconies of the houses, it also cut the view towards poplar trees the houses used to have. Being an explicit example of insensitivity towards context and the narrow scope of green building certification systems, this item is directly linked with the items 3 , 4 , 8 and are indirectly related with the items 1 , 2 , 5.

Figure 1 : Gordion Shopping Mall with its surrounding (https://surdurulebilirfikirler.files.wordpress.com/2013/11/gordion.jpg, retrieved July 20, 2015)

The crucial criticism point related with the lack of context-depended understanding is not limited with the scale of the building but also includes architectural language of the building as well. Although the building is claimed to be referencing elements from Gordions, an ancient civilization lived near Polatlı, these elements remain quite eclectic. To illustrate, the red columns at the entrance are told to be derived from the Gordion knot (Figure 2). However, they seem to be just added to the design at the end in order to give the impression as if the building was referencing something local.

Also, the overall design of the building does not reflect a critical evaluation of the context. As if the building could be located anywhere else on earth, its façade has similar elements with other shopping malls designed by the same architects which have totally different locations and contexts, such as Mall of Qatar (Chapman Taylor Architects, 2015). With these aspects, the building also reflects the criticisms discussed in the items 2, 4, and 5.

Figure 2: Gordion Shopping Mall entrance (http://www.mimarlikforumu.com/attachment.php?attachmentid=16721&stc=1&d=1252497022, retrieved July 20, 2015).

When examined from a closer perspective, the building is contradictory to many of the sustainability principles. For example, the site of the building used to be a green park area before the construction. In order to construct Gordion shopping mall, this green area is spoiled and the stream bed in the area was changed. Without appropriate setback distance, the building comes too close to the road. Also, during the construction, it was commonly complained by the people that the traffic was tied up. It can be interpreted that check-list based quantitative structure of green building rating systems is not able to conduct a comprehensive and realistic evaluation considering qualitative facts of the projects. This is also related with 2, 5, and 7.

Other than these points, it also has the common problems of typical box-like shopping malls. Closed and introverted building typology isolates people from their environment (Figure 3). It encourages transportation by cars as having parking areas for 2500 cars. Also, the areas such as food court are quite low, enhancing the impression of closeness. Items 2 and 4 are again reflected with these terms.

Figure 3 : Gordion Shopping Mall (Chapman Taylor Architects, 2015, retrieved on July 20th, 2015)

This building got a BREEAM certificate although it was contradictory to some of the important principles of sustainability. It lacks a holistic, place-based collaborative approach. These facts reveal the problematic nature of check-list based certification systems which can sometimes award fragmented solutions divorced from the overall context of the project. It also shows the potential of legitimizing problematic designs and constructions by using these accreditations.

2.2.3. Necessity of a mindset shift in environmentally sensitive architecture

While accepting their significant contributions, current green building rating systems have their limitations. As discussed in this chapter, the most widely recognized green building rating systems cannot adequately consider the necessities of place-specific, environmentally sensitive design in a single tool and therefore do not assist in the overall assessment of sustainable development because of their over-standardized, ready-made nature and insensitivity towards context together with their narrow scope. It should be realized that these rating systems are only supporting tools and not satisfactory enough to be the basis of environmentally sensitive approach.

It is certain that current green building practice have important and necessary concerns. However, it does not mean that these kind of buildings are well-designed only because they are green and have adopted ecological principles. Although having ecological concerns is a significant aspect, there are other concerns that properly designed buildings should have in order to create well established environments. Being environmentally friendly is not merely being energy efficient. It requires a holistic responsibility towards different dynamics composing the specific context of each project.

When today's environmentally sensitive architectural practice is examined, it can be observed that architects and green building certificate associates are focusing on earning more green score points for their buildings rather than a detailed integrated process for making the buildings really sustainable. While doing this, they are becoming distant from some of the baseline architectural principles. This is because current green building trend is boosting the use of 'ready-made green recipes' and pushing the actors of design process to follow check-lists. The buildings occurring as a result of this mainstream practice are 'green certified' but not 'context certified'.

Green design should not be an isolated design trend, but it should be an integral part of a holistic environmentalist understanding. The most important point here is that green principles are not some kind of technical details which can be embedded to the buildings at the end of the design, but they are a set of decisions which shall be made through the overall process. Due to this reason, architects, engineers and other decision makers must constantly draw from each others' constant feedbacks.

It should also be remembered that the interdisciplinary coordination through all stages of integrated design process is the core of environmentally sensitive design in architectural practice. This coordination shall lead the process with feedback in order to obtain a holistic integration of ecological design parameters together with the context and user factor to the building (Plaut et al., 2012).

Current green building design and rating systems are mainly based on a mechanistic worldview which is is fragmentary and approaches a problem by dividing it into smaller parts just like the different parts of a machine. It separates elements from each other and creates an environment of autonomous fragments in architecture (Portugali, 2006). This perspective states that humans are above nature and they can control it by the help of science and technology in order to solve their problems (Redclift and Sage, 1994, 17; Rees, 1999, 24; du Plessis, 2012, 8).[15] This reductionist mechanistic approach creates buildings which are taking into consideration neither context nor user groups living in different regions and conditions.

Reed (2007) characterizes green design and associated assessment tools as indicative of current reductive and fragmented thinking since they identify discrete performance requirements.In her article *Towards a regenerative paradigm for the built environment,* du Plessis also argues that the dominant sustainability paradigms

are reaching the limitations of their usefulness due to their conceptual foundation in an inappropriate mechanistic worldview (2012).

All in all, current mainstream green design practice, together with its rating tools and certification systems can be stated as insufficient for todays expectations. Sustainability requires a holistic way of approaching the cological problems. At this point, it is important to grasp the necessity of a mind-set shift. The objectives of sustainable development cannot be reached by new forms or by new techniques. But ‘they need a new way to look at things, another way to ask questions, new combinations of existing solutions’ (Kohler, 1999).

Being environmentally responsive must include being responsive to the context as well. Only after the emphasis is paid on the idea that creating meaningful dialogue with the surrounding and engaging the specific circumstances of the place, a building can be called as environmentally responsive. Design strategies for ecological buildings shall approach them in a holistic manner and consider how the suggested ecological strategies are reflected on the overall design together with its surrounding.

Assessment systems are necessary as supporting tools and should build in regional flexibility while retaining global priorities. Rather than standardized global systems, each country and region should develop its own assessment criteria. However, the distinction between the assessment tools and design frameworks should be clear.

There is an urgent requirement of context-depended understanding in architecture which embraces the ideas like locality, place, in situ and pays more attention to the user perception. With this regard, uniqueness and specificity should be promoted against over-standardization. Social dimensions of sustainable development shall also be included in the environmentally responsive design

process. There is a need for a more sophisticated and operational framework which is capable of guiding the environmentally responsive architectural practice to go beyond today's common understanding of green buildings.

In this study, it is proposed that, this place-specific understanding could be satisfied by means of re-consideration of the concept of *genius loci* within the practice. *Genius loci*, as a context- depended understanding of architecture, may have a significant contribution by complementing the phenomenological side of environmentally sensitive approach in today's practice. Interpretation of this concept to the integrated, collaborative and co-evolutionary design process may be the key for solving the problems discussed so far.

CHAPTER 3

RECONSIDERATION OF THE CONCEPT OF *GENIUS LOCI* IN ARCHITECTURE

3.1. Place as the Derivation of *Genius loci*

"The existential purpose of building (architecture) is therefore to make a site become a place, that is, to uncover the meaning potentially present in the given environment."

Norberg-Schulz, 1980,18

Place is one of the the most essential elements in architectural practice. It is also the primary concern of *genius loci* since *loci* denotes 'place' and *genius* implies 'uniqueness' or 'authenticity' of place. As it will be explained in more detail, *genius loci* is often referred as 'the Spirit of Place', which is the unique experiential quality or character of a place that is exclusive to that place (Norberg-Schulz, 1980). *Genius loci* arises from the specific place, they are interrelated and nested. Any insight into *genius loci* is inevitably rooted with place. Hence, it is of great importance to understand the notion of place and the uniqueness of each place in order to have an understanding of *genius loci* in architectural practice. With this regard, a brief discussion on place will pioneer the definitions and discussions on *genius loci* in this chapter.

3.1.1. The notion of place

Even though place is one of the strongest means and mediums of building a community and shaping identity; for many years it was not considered a relevant

subject in policy-making, in turn, terming it static, apolitical, idealized and naïve (Birkeland, 2008, 292). Now, however, place is seen as a highly political entity, a tool for social and political contestation and the development of communal psyche. This leads to the question of what exactly place is.

The definition of place is 'a particular position, point, or area in space; a location' and 'a building or area used for a specified purpose or activity' (Oxford Dictionary). Place refers to a particular space in which one is situated. Things like material substance, shape, texture and color determines an environmental character which is the essence of the place (Norberg-Schulz, 1980,6). However, it is insufficient to approach place as solely being composed of quantitative qualities in the physical word. Place is not only a cognitive phenomenon, rather it refers to the holistic experience of being in place and having a meaningful place in an emotional and existential sense (Birkeland, 2008, 292). In Raymond Williams' sense, place is a way of life, culture, or 'structure of feeling' (Williams, 1985; Jackson, 1989).

Insights into the *genius loci* result from fundamental founding concepts on space and place. The relationship between space and place as well as their differences has long been an important issue in architectural discourse. Because its validity depends on human experience, place is also referred as 'Humanized Space' (Tuan, 1977, 54). This explains one of the basic differences between space and place which exists with regards to the meanings attributed to place by humans. Place is more than an abstract location and this is stressed by Taylor (1999) as 'space is everywhere; place is somewhere… Place is space with attitude.' Imamoglu also indicates that 'Place is the physical environment given purpose and meaning by people' (2009, 155).

Place also possesses a distinctive quality of experience, referred commonly as a 'sense of place' (Mang, 2009). Academic discourse describes sense of place as dynamic, historical, contingent, and inseparable from human perception and

experience (Dale, Ling, Newman, 2008; Tuan, 1977, Brown & Raymond, 2007, Imamoglu, 2009).

Since place is a total phenomenon composed of both qualitative and quantitative elements, it is necessary to approach it as a whole. Concentrating just one of these aspects hinders one from truly understanding the essence of a place. It is not enough aiming to have only objective, scientific knowledge about a locality just as it is also insufficient to focus only on subjective sides. Place is like *a pair of scales* which requires equal weight from the both sides. While physical characteristics compose one pair of the scale, phenomenological approach could be regarded as the other one.

3.1.2. Character and authenticity of place

It was mentioned that one of the basic distinctions between space and place exists with regards to the human perception. Another one exists with respect to the character of the place. Norgberg-Schulz asserts that 'a place is a space which has a distinct character' (1980, 5). He also argues that each place, whether natural or man made has distinct phenomenological characteristics by stating that even the sky possesses different characteristics not only from time to time but also from place to place (Norberg-Schulz, 1980). Since the identity of a place is a complex totality, it is important to approach it with a holistic manner. In this sense, every 'place' is unique. This 'uniqueness of place' is also commonly referred as 'authenticity of place'. Without this unique identity, or authenticity, a place becomes just another piece of space, which is related with 'inauthenticity' (Reph, 1976).

3.1.3. Identity, place-attachment and placelessness

Architecture is not merely based on creating extra-ordinary forms nor devising well-functioning machines. Architecture, most of all, is for humans and

thus has to consider human-related factors. The role of the architect is to create meaningful places where man can experience belonging and identity, attach himself and identify himself within. As Heidegger argues, structure is essentially designed for man's dwelling (1971, 141-160).

The way humans dwell is the way they exist on earth, it is an extension of man's identity (Heidegger, 1971, 141-160). With this regard, in his phenomenological approach developed on the basis created by Heidegger, Norberg-Schulz draws attention to the fact that place attachment is one of the most key elements for identity of a person and human identity presupposes the identity of place (1980, 21-22).

In his book *Place and Placelessness,* Edward Relph states that places are 'fusions of human and natural order and are the significant centers of our immediate experiences of the world' (1976, 141). He attempts to discover how and why places are meaningful for people. Places are tied closely with people and meanings or memories that people relate with them. Relph relates place-attachment with the concepts of *insideness* and *outsideness* which is his contribution to the notion of place (1976). Through insideness and outsideness, different places take on different identities. Whenever a person has an attachment with a place, he feels safe, enclosed, ease and *inside*. When he feels threatened, exposed and stressed he feels *outside*.

However, this vital relationship between human and place – both natural and artificial – was overshadowed especially beginning from the modern era. Relph connects this insensitivity to the significance of place with an uncritical adoption of mass techniques – mass production, mass communication and mass culture (Relph, 1976). The result is 'undermining of place for both individuals and cultures, and the casual replacement of the diverse and significant places of the world with anonymous spaces and exchangeable environments' or in other words,

placelessness (Relph 1976, p. 143). Therefore, placelessness could be regarded as loosing the sense of place as well as loosing the authenticity of place.

One of the most important problems about globalization and its reflections on architecture may be the over-standardization of architecture and the attempts to integrating architecture to mass-production. Close linked the envronmental issues discussed in the previous chapters of the study, Norberg-Schulz also discusses the environmental crisis which is strongly related with the loss of place according to him (1980).

> In fact, modern man for a long time believed that science and technology had freed him from a direct dependence on places. This belief has proved an illusion; pollution and environmental chaos have suddenly appeared as a frightening nemesis, and as a result the problem of place has regained its true importance
>
> (Norberg-Schulz, 1980, 190).

The second phase of modern movement took into consideration of locality rather than focusing on a set of ready made principles, general types and solely cubist language. The purpose was to obtain buildings possessing individuality in terms of space and character or in other words, recreating authenticity of places against placelessness.

Today, however, the current state is more complicated considering that the consumption culture possessed to societies is creating 'ready-made design solutions', shaping cities in this directions. In order to go beyond these 'ready-made design solutions', which was discussed in the previous chapter, architecture needs to remember place-sensitive and environmentally-sensitive solutions. Although it is not a new concept, a reconsideration and analytical evaluation of the idea of *genius loci* is of vital importance in order to reconnect the human beings with the place.

3.2. *Genius loci* as a Context-Depended Understanding of Architecture

3.2.1. Definition and historical basis

Genius loci, from its origin, is a Roman concept. It comes from the belief that every place has a unique guardian spirit protecting it. For this reason, it is also translated as 'the spirit of place'.[16] After years, this mythological concept of *genius loci* was transferred to the architecture, literature and sociology.

The Norwegian architect and phenomenologist Christian Norberg-Schulz is a key theorist introducing *genius loci* to the architectural field. He elucidates *genius loci* in order to make his point of necessity of context-depended understanding in architecture by relating it to the phenomenological approach. The aim of Norberg-Schulz is not only examine the physical characteristics composing different places, but also the sense-related experiences of the place.[17] In this regard, Norberg-Schulz uses *genius loci* as a metaphor for the unique essence of places. Just as each locale has its own genius in Roman belief, each place has its own identity in architecture. Although Norberg-Schulz uses townscape to study examples of locality in order to clarify his standpoint, the spirit of a place could be extended and mentioned for any scale, from buildings to streets, cities and even some extend to countries.

Genius denotes what a thing is, or what it wants to be, to use a word of Louis Kahn (1980,18). Generally, *genius loci* is referred as the locality, or the local character of places which constitutes 'what it wants to be'. *Genius loci*, from a

[16] It is possible to find the similar beliefs under different names in different cultures. Greeks, for example, called it as *Daemon* and it was even older than genius loci of Romans'. Old Turkish tribes also believed in a guardian spirit which creates and protects locales and named it as "Yer Ana", meaning "Mother of Places". It was mentioned like a living entity each part of which were interrelated with each other like a daisy chain (Wikipedia).

[17] Based on the same gestalt psychological theory employed by Kevin Lynch, Norberg-Schulz (1980) explores the character of places on the ground and their meanings for people, although Lynch (1960) ignored meanings and focused on structure and identity (Jiven & Larkham, 2003).

phenomenological perspective, could be described as representing the sense people have of a place.

3.2.2. Dimensions of *genius loci* and its interpretation with contextuality

Architecture is not solely based on scientific work. It rather includes other dimensions such as artistic, sociological and psychological aspects. These dimensions are at least as important as the analytical and scientific studies. According to Norberg-Schulz, scientific approach needs to be complemented with other methods, this kind of complementary approach is more illuminating for understanding quality, which gives man his identification (1980).

This brings into existence the necessity for holistic thinking and consideration of contextuality. Context can be described as the overall circumstances and factors which have the possibility to effect a phenomenon whether it is an idea, or an object, or architecture. In the case of architecture, these circumstances and factors mainly includes social, cultural, economic and political variations as well as physical characteristics specific to its environment.

According to Nesbitt (1996), every knowledge is context related which means that in order to fully grasp a knowledge, one should approach it as a whole together with the circumstances it was created. Accordingly, context could be regarded as a phenomena enabling one to approach problems from a holistic perspective, considering its both quantitative and qualitative relationships with other entities.

The necessity for context depended understanding is discussed by various architects, critics and authors. Frampton's concept of regionalism focuses on the relationship of a building to its site and location in a sociological context (1983). For him, geography, climate, environment, cultural background shall all be brought

into consideration in order to strengthen the regional identity and contribute to the recreating the place (Frampton, 1983). Johnson supports this idea by stating that 'it is not possible to enjoy an individual building if it does not belong to suitable environment which constitutes the coherent picture' (1994). Capon (1999) defences contextualism by stating that just as a building can be a whole within itself, it is similarly necessary to relate buildings both amongst themselves and amongst the environment they find themselves in. Among various studies on contextualism in architecture, theses of Güleç (2011) and Çizgen (2012) also analyses the evolution of contextualism, different attitudes and interpretations by different architects.

In his novel *Sinan: Bir Düşsel Yaşamöyküsü,* Abidin Dino remarks the context-depended understanding of architecture. He defends that architecture arises from the specific conditions of a place in a specific time. Dino's ideas about place and context are maybe most crystal clear in this sentence:

> *Her toprağın bir isteği, bir doğurma zoru vardır devrine göre. Sanırım mimarlık, işte bu isteğin ebeliğini yapmaktır.*
>
> Each land has an intrinsic urge, a necessity to give birth depending on its era. I suppose architecture is midwifery of this urge.
>
> (Dino, 2014, 14)

Genius loci, with this regard, shapes this 'intrinsic urge' that a place has, and its specific character that needs to get involved in the process of reshaping that place with future interventions. This intrinsic urge is a totality made up of different patterns and elements.

3.3. Reconsideration of *Genius loci* in the Current Architectural Practice

3.3.1. Reading *genius loci*

Within the aspects discussed in this study, *genius loci* denotes a comprehensive method, a re-consideration, a critical evaluation of the context. Instead of taking it merely as a spiritual concept, it shall be considered as a practical tool drawing attention to reading the unique characteristics of different places.

It is up to architect how to approach the context. But it is of significant importance to analyze the *genius loci* and develop design strategies accordingly during the integrated design process. *Genius loci* requires a critical evolution of the conditions and architect's own interpretation to the existing situation.

According to Renzo Piano, knowing how to listen to places is vital when starting a project since each and every place is unique (Palazzo & Steiner, 2012). When talking about his site visits, Piano tells that,

> To listen is useful because it is the art of stealing, of taking, of capturing: it is bare-faced robbery, with a noble goal. […] It is necessary to listen to the thin voices, the silent and weak voices; to capture the essence of the things implies a training in listening that is not learned at school, but through life experiences.
>
> (Palazzo & Steiner, 2012)

Here, 'the art of stealing' is actually capturing the essence of a context, a place together with its inhabitants. Of course, 'to listen' is not limited with its physical meaning, listening by ear, but it refers trying to pick up clues for understanding the essence of the place. 'listening to the place' defined by Piano actually refers to the 'reading of *genius loci*' mentioned here. This reading includes analyzing and evaluating various characteristics composing *genius loci*.

3.3.2. Layers of *genius loci*.

In the light of the descriptions about *genius loci*, it is possible to make a categorization to illustrate the layers composing *genius loci*. Since the reconsideration of *genius loci* in this study aims to emphasize the understanding of specific nature of different places, the categorization of the elements is made in the light of this concern. Understanding these layers enables one to read the *genius loci* of places comprehensively as well as using it for the design frameworks developed for context-depended approach.

Table 3: Layers of *genius loci*

1.	Human context	- Historical existence - Social & cultural existence - Psychological, ontological & cognitive existence
2.	Natural context	- Living entities of ecological environment - Physical characteristics of ecological environment

Since these characteristics composing *genius loci* are closely interrelated with each other, it is not possible to approach them in a reductionist manner. Because of this reason, sub-categorzations are set within two main layers as illustrated in Table 3. Each of these layers will be discussed briefly.

3.3.3.1. Human context

The first layer composing *genius loci* could be mentioned with regards to the human context. By human context, what is meant is all the tangible and intangible aspects directly resulted from the human activities and existence on

earth. This layer includes sub-categories such as historical existence, social and cultural existence, and psychological, ontological and cognitive existence.

Historical existence of humans on Earth is one of the vital elements of *genius loci*. Mostly, it is the visible and invisible footprints of history remained in a place, the traces which could be sensed in a place. This element includes the specific architecture of the place, namely, all the existing built environment and historical settlements, their architectural language and all the characteristics.

It is possible to read a place by these footprints; they tell the story of a place. These visible and invisible historical layers do not only reflect the story of different periods of time but also the story of different cultures and civilizations who occupied the same place. Sometimes the spirit of a place has given shape by the contributions of various groups of people. It is important to consider all these factors for reading the *genius loci*.

Social and cultural existence of humans includes all the behavioral habits, traditions and all the activities of the habitants of the specific region or place. This aspect is closely related with historical existence and they are inseparable. It is a broad category including economic aspects, lifestyles as well as construction techniques and know-how specific to the place.

As explained clearly by Johnson, 'buildings must relate not to their neighbors in the street but to the broader context of images and ideas that constitute culture' (1994, 284). With this regard, social and cultural existence transmits a strong sense of authenticity of a place.

Psychological – ontological – cognitive existence includes all perceptions, observations and understandings related with place such as user perceptions, poetics of place, sense of order, aesthetics, harmony, meanings, values as well as

all the psychological impacts. This aspect composes mostly the phenomenological understanding of place and is a significant part of the contextual understanding which is widely neglected.

3.3.3.2. Natural context

Natural – ecological context is the other main layer composing the *genius loci.* Nature is an integral part of *genius loci*, not a separate element relevant to ecological architecture. Norberg-Schulz also considers nature as the basis for people's interpretation and it is in relation to nature that places and objects take on meaning (1980). He states that 'man is an integral part of the environment, and it can only lead to human alienation and environmental disruption if he forgets that' (Norberg-Schulz, 1980, 23).

Place sensitivity cannot exist without natural and ecological sensitivity. Frampton also draws attention to the man-nature relationship in *Towards a critical regionalism: six points for an architecture of resistance* (1983). The architectural understanding based on local information propounded by him requires realizing the conditions of nature and a new way of life mindful of nature (Frampton, 1983).

Living entities of ecological environment includes all the plants, animals, micro-organisms and their relationships with each other as well as the overall environment. It is of vital importance to respect the habitats of a place and remember that they are also a part of the *genius loci*.

Physical characteristics of ecological environment, includes aspects such as topography, climate, direction and velocity of wind, solar conditions at different times of the year, temperature, humidity, characteristics of soil, rainfall, as well as existing natural resources.

In order to grasp the *genius loci*, a map of life of that specific place is of significant importance. Natural resources, animals, plants and all living organisms, their histories and current conditions, their interactions with each other as well as the other layers of *genius loci* shall be read and addressed carefully. Only by accepting the fact that human context and natural context are both equal parts of the *genius loci*, effective solutions for architectural practice can be developed In these terms, *genius loci* is a key concept healing the dis-functioning relationship of man and environment.

3.3.3. Evolutionary nature of *genius loci* and degree of flexibility

Genius loci is not a static, but a dynamic concept which harbors a certain degree of flexibility in itself. It shall not be treated as a finished, end-product to be preserved as it is but rather an evolutionary soul of the place which is open to contributions.

Norberg-Schulz states that the *genius loci* of a place does not necessarily changes or gets lost although the structure of a place is not fixed and this may sometimes lead places to change rapidly (1980,18). Places still conserve their identity during a certain stretch of time, and this is *stabilitas loci* (1980, 18). He questions how stability is compatible with the dynamics of a place (1980,18).

Innovation is at least as important as preservation for *genius loci*. Individual creativity does not harm *genius loci*. On the contrary, they attribute to it, they help *genius loci* to evolve and progress. Just like historic structures, new constructions also should be unique with their characteristics and temporality. In this way, the historical fabric is protected in a healthier manner. It is still possible to mention the existence of the *genius loci* after years, if the basic principles, such as the type of settlement and the way of building is respected. To this respect, it is obvious that *genius loci* does not require a strict preservation.

It is also argued by Groat and Cengizkan that while change is an essential that the city cannot prevent, it is however important to continue restructuring in a manner that gives importance to unity / wholeness: The city is unitary amongst change; excessive innovation and extreme-conservative approaches can harm the city's historical continuity and unity (Çizgen, 2012, 63).

Markeviciene denotes that *genius loci* sites cannot be (re)created intentionally due to their specific nature (2012). Although they might reveal and enhance historic information, extended restorations and reconstructions of a historic site usually wipe out its *genius loci*. While preservation of natural environments means protecting against threats and letting nature be and live as it lives, protection of *genius loci* sites means letting people continue as well. With this respect, once *genius loci* is understood and treated accordingly, a consistent evolution of the place together with urbanization may be achieved. This might be the way for urbanism and urbanization to be reconciled.

3.3.4. Case study: Dominus Winery

In this part, Dominus Winery is examined with regard to the place-specific understanding of *genius loci*. This building was chosen as a case study considering that context is not merely composed of the built environment in the close surrounding as a shallow understanding of today's practice, but it is the overall circumstances that the design problem is situated in, as discussed in this chapter.

Also, the architects of the building, Herzog & Meuron is one of the practitioners considering and interpreting phenomenological aspects related with perceptions in their designs. Jacques Herzog states that they want to 'make a buildings that can cause sensations', and that the impact of their buildings 'is the immediate, visceral impact they have on a visitor' and which is all that is important in architecture for them (Cecilia & Levene, 1997, 7-21).

Winning Pritzker Prize in 2001, the works of h&dM is stated to be 'charged by memory and invention, reminding us of the familiarity of the new' (Jimenez, 2001).[18] Through the reading of Dominus Winery, 'one is also able to understand the architects' piercing reading of site by the way they disclose its hidden or obvious specificity, initially manifested through a detail, a material, a texture, a scent, or a wedge of light' (Jimenez, 2001).

Dominus Vinery is completed in 1998. It is located on Napa Valley, near a small town.[19] The architects aimed reflecting the full potential of the land by integrating the building to the landscape as if it was a natural part of the site. It was named as 'the stealth winery' by local people, which is somehow reflecting that the architects were successful in their intents.

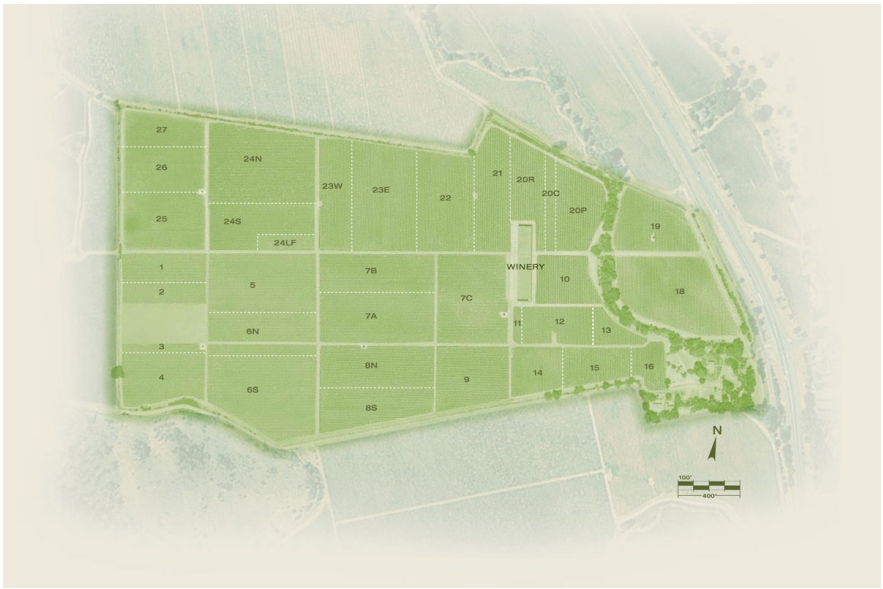

Figure 4: Site of Dominus Winery, Napa Valley (http://dominusestate.com/the-estate/napanook-vineyard/vineyard-facts/ ,Retrieved July 9, 2015)

[18] Carlos Jimenes is a Pritzker Architecture Prize juror and the author of the essay written on H&dM on pritzker website.
[19] It is also the first building in US designed by Herzog & de Meuron

Figure 5: Dominus Winery
(http://www.bravoyourcity.com/story/dominus-estate, Retrieved July 9, 2015)

Although there are not built environment in the close proximity, the building is still based on a critical evaluation of the context in terms of forms, material, its position and technical details.

In terms of formal characteristics, architects explain the form of the building as being integrated to the linear, geometric texture of the vineyard (Figure 4-5). By its stone walls, its is also considered as referencing the stone barns common to Napa Valley (Choi et al., nd). Therefore, the rectangular form is not as a result of minimalist and cubist approach of modern architecture, but derived from the land itself.[20]. With this perspective, the building is a comprehension of human context, layer 1 of *genius loci*.

[20] As identified by Güleç (2011), there are architectural critics stating that Herzog & de Meuron has a modern, cubist, international language. However, the architects state that they do not believe in timelessness value and are far away from the international identity of modernist architecture (Zaera, 2005; Güleç, 2011). The architects are interested in everything related with local character and have

The most outstanding feature of the building is the stone walls, made by the locally found stone, and the technique that they were constructed. Exterior walls are made up of stainless steel baskets filled with basalt rocks from the nearby American Canyon. These walls are allowing natural ventilation as well as natural lighting for interiors during daytime and artificial lighting senses from the outside during evening. At the daytime, sunlight goes through the walls in this way and creates random effects changing according to weather (Figure 6). According to the lighting condition required, the gabions are filled with more or less densely, to allow daylight penetration through different transparencies.

The walls also designed in accordance with the local climate which is very hot by day and very hot by night (Herzog & de Meuron, 1997). The mass of the walls, in these terms, helps insulating the interior rooms. With the consideration of local climate, materials and lighting conditions, the building is designed according to a careful reading of natural context, layer 2 of the *genius loci*.

Figure 6: Walls of Dominus Winery (http://dominusestate.com/wp-content/uploads/2015/03/architecture.jpg/ , Retrieved July 9, 2015)

developed a perceptional relationship with the vernacular instead of a stylistic analogy (Curtis, 2002).

Figure 7: Dominus Winery (http://dominusestate.com/wp-content/uploads/2015/03/architecture.jpg/ Retrieved July 9, 2015)

The main path of the vinery goes through the building (Figure 5 – 7 – 8)**.** In this way, the building bridges the pathway and the entrance gate becomes a kind of lens where the scene is fully visible. Glass offices also have panoramic views, strengthening the visual relationship between inside and outside, again relating human existence with natural context. At the interior, there is a different combination of material use, including glass, wood, and reinforced concrete. This creates a different spatial experience. The existence of the consideration of user perception for different lighting strategies, the panoramic views from the main gates as well as for the glass offices relates the design with the psychological, ontological and cognitive existence, layer 1 (Figure 7 -8 -9).

It is possible to sense the *genius loci* and architects' original interpretation to it. They take references from natural environment, material, and light and reinterpret them in a original way. Dominus Vinery is referred as being a design experience on the role of materials and tectonics for the reinterpretation of contextuality (Güleç, 2011). It is meaningful in the relationship it creates with the existing vinery and surrounding. The architects have created a strong dialogue with

the surrounding by interpreting the natural with the artificial, existing with innovation. Instead of an immediate, radical intervention to the context, they prefer a harmonious yet unique design, creating a sense of authentic place.

Figure 8: Dominus Winery (http://dominusestate.com/wp-content/uploads/2015/03/architecture.jpg/ Retrieved July 9, 2015)

Figure 9: Entrance gate of Dominus Winery (http://dominusestate.com/wp-content/uploads/2015/03/architecture.jpg/ , Retrieved July 9, 2015)

As discussed in this chapter, *genius loci*, as a context-depended understanding of architecture may be the most important complementary aspect for solving the problems of today's environmentally sensitive architecture. A careful reading the layers of it, both human context and natural context is of vital importance with this regard.

However, the shift to a new conceptual framework based on *genius loci* requires also a shift from the existing green building paradigm to a new practical basis based on more comprehensive ecological underpinnings. Because of this reason it is proposed that the *genius loci* has to be complemented with the ideals of regenerative design, which will be discussed in the next chapter.

CHAPTER 4

REGENERATIVE DESIGN AS AN ALTERNATIVE APPROACH AND ITS EXPENSION REFERRING TO THE IDEALS OF *GENIUS LOCI*

4.1. Regenerative Design, Definition and Basis

In this part of the study, the concept of regenerative design is introduced as a catalyst for realizing the principles of *genius loci* into environmentally sensitive architectural practice. Although they were initiated by different professionals, both *genius loci* and the regenerative design have similar roots and rely on similar principles. In this part of the study, regenerative design will be discussed in a comparative manner in order to reflect that it is more suitable for the ideals of *genius loci* than the existing green design paradigm.

4.1.1. Definition of Regenerative Design

Regenerative design is an alternative and evolving environmentally sensitive approach which has not been notably well-known yet. To give a brief definition, regenerative design is a holistic, process-based, ecological design approach embracing living-systems worldview. It aims to revitalize environment by co-evolution of humans and natural systems.

Regenerative design offers substantial new solutions to the current green design practice. It challenges the orthodoxy of current practice and the design tools that support it by place-specific solutions. This alternative approach is not limited with the building scale but it deals with the design problems by approaching them

from a broader context. With this regard, it has the potential to initiate the necessary mindset shift adopting the ideals of *genius loci*.

In order to have a better understanding of this concept, regenerative design shall be located within the broader sphere of todays construction practice. Considering the brief definitions given by Plaut et al. (2012), *degenerate* means 'to decline in value or worth', *sustain* is 'to maintain; to keep from failing', and *regenerate means* 'to give new life, strength, or vigor'.

Regenerative design is sometimes considered as a different design paradigm (Figure 10). For example, one of the prominent advocates of regenerative design, Reed, depicts regenerative design as a design practice having higher aims than the sustainable design in the trajectory he prepared (Figure 10)[21].

On the other hand, considering the sustainability definition within the perspective of this study, regenerative design could be regarded as being a subset of sustainable design since it is also 'an aware way of building, keeping in mind that not each human being but also all kinds of living entities have the right to pursue their lives in a healthy and suitable way' (Figure 11). In these terms, all the regenerative designs could be accepted as 'sustainable' whereas not all the sustainable designs are necessarily regenerative.

[21] Bill Reed is an internationally recognized proponent and practitioner in sustainability and regenerative design field. He is a founding board member of the US Green Building Council and co-chair of the LEED Technical Committee from its inception in 1994 to 2003 (regenesisgroup.com ; integrativedesign.net). That he is currently working for firms developing regenerative projects and defending the shift from green design to regenerative design reflects that even the early proponents of LEED and green design has started shifting their minds towards this alternative approach.

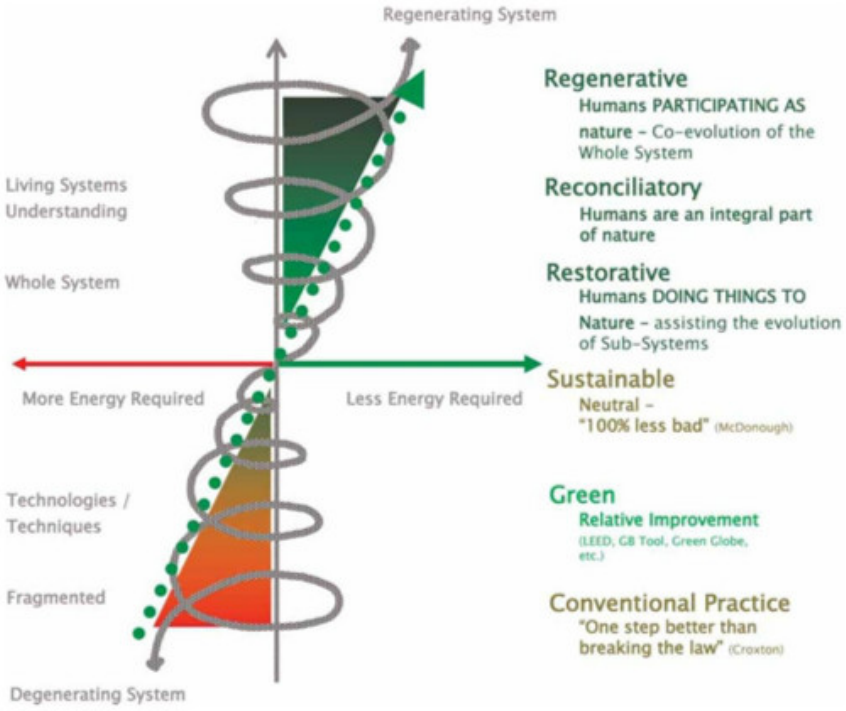

Figure 10: Trajectory of environmentally responsible design. (Reed, 2007, 675)

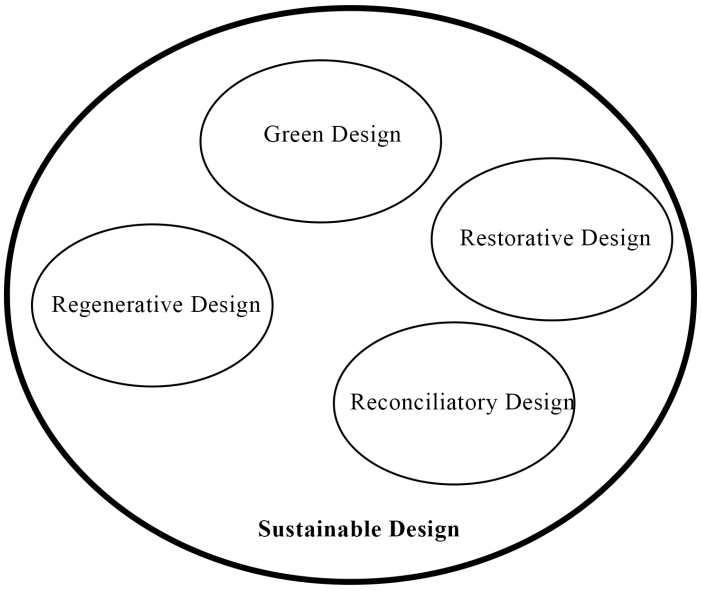

Figure 11: Sustainability spectrum within the perspective of this study

It should not be misunderstood that it is the building which is regenerated but the regeneration occurs 'by the ways that the act of building can be a catalyst for positive change within the unique place in which it is situated' (Cole, 2012a, 1). Evoked by its name, re-generative, this approach is based on the point of view that decreasing or minimizing the harmful affects of human and building industry on earth, sustaining what is present cannot be accepted as satisfactory. Instead, the damage has given so far by human being has to be eliminated and reversed by comprehensive strategies of architectural and landscape design in the construction field.

It has been argued that green design starts from the point of decreasing the harmful effects of building industry (McDonough & Braungart, 2002; Reed, 2007). Unlike green design which is premised on creating buildings doing less harm, regenerative design and development views the role of constructed projects as having the capability to build natural and social capital (Cole et. al. 2012, 100). An early advocator of regenerative design, Lyle defines regenerative design as 'design that replaces linear processes with cyclical ones, allowing for continuous replacement, renewal, and rebirth' (2009).

Re-generation, with this regard, could be extended from ecological re-generation and in may also be thought in terms of cultural and social regeneration within the architectural practice. Architectural interventions of a certain place may also revitalize its *genius loci*.

4.1.2. Objectives and Innovations

Regenerative design aims to protect and sustain existing, remedy the harmed, and bring to the existence of the lost part of the systems. Regenerative design insists on an integration of human development with natural systems in which both are sustained, nurtured, and enhanced (Reed, 2006).

Although this new paradigm is still evolving and needs cultivation, regenerative design might be accepted as the future of green design practice possessed by the current rating systems (Hodgin, 2008). The emphasis is laid upon not only healing the environment but also education of inhabitants and community through buildings (Cole et. al. 2012).

4.1.3. Basic Tenets and Conceptual Underpinnings

In order to have a better understanding of the regenerative design and why it is more appropriate for integrating *genius loci* to ecological architectural practice, it is important to examine the basis of this approach.

Core tenets of regenerative design can be summed as systems thinking, community engagement and respect for place. Together with these core tenets, regenerative design, by its philosophy, could be stated as being based on *deep ecology* and its foundations are linked with *living-sytems worldview*. In this respect, these two approaches are crucial in order to grasp the possible relationship of regenerative design with the principles of *genius loci*.

Regenerative design has similar roots with the Naess' deep ecology concept which was explained briefly in the first chapter. Regenerative approach embraces organic-holistic worldview instead of mechanistic-fragmentary worldview. It considers earth as being not only a settlement place but also a living entity, an organism which has its own inner dynamics. It seeks solutions to environmental problems in the architectural and construction practice since built environment could be an important contributor as well as being responsible from the problems that are being faced today.

Deep ecology and radical ecology embraces a different worldview. The current mechanistic metaphor that green design is based on is paving way to a holistic living systems worldview.

Living-systems worldview observe the world as 'an interconnected, complex, living and adaptive social-ecological system that is in flux' (du Plessis, 2012, 15). It represents 'a shift from the deterministic, Cartesian, clockwork system to a more holistic understanding'. Whole systems or living systems thinking goes beyond the fragmented, mechanistic worldview interpreting that entirety is interconnected and the world is activated by complex interrelationships (Reed, 2006). This holistic thinking paved the way for regenerative design to emerge.

4.2. Regenerative Design and Its Critical Position to Previous Green Design Practice

4.2.1. Regenerative design as a proposed mindset shift

The intent of the initiators of regenerative design is not to overcome the shortcomings of current green design practice and its assessment tools since they already have deep flaws from the basis. The aim is 'not a change of techniques but a change of minds' (Mang & Reed, 2012, 26). Regenerative approach requires a fundamentally different way of thinking and offers a mindset shift. Reed defends the need for a mindset shift in the field of green design in order to have a deeply integrated worldview required to design, build, and heal with the whole system in mind (2007, 675). As stated by Lyle, 'Regenerative design requires patterns of thought quite different from the patterns that have become customary' and he reminds Einstein's advice that 'significant problems we face cannot be solved at the same level of thinking we were at when we created them' (Lyle, 1994,333).

4.2.2. Regenerative design as a critical evaluation of green design practice

Regenerative design could be considered as an appropriate foundation where *genius loci* could be located. From the starting point, if the *genius loci*-oriented design understanding is placed on a weak foundation – such as current green design practice – it is possible that the system might collapse after a certain period of time. Therefore, it is vital to create an appropriate platform where the discussions and studies on *genius loci* could be initiated and blossom to give fertile solutions for the architectural practice.

A comparison of green design and regenerative design explains more explicitly why regenerative design should be chosen as the catalyst for adopting the concept of *genius loci*. The following list (Table 4) illustrates a summary of the comparison of green design with regenerative design with regards to their compatibility with *genius loci*. The comparative list eliminates general and indirectly related aspects of two design approaches such as 'doing less harm' by green design and 'net positive' approach of regenerative design. The list is prepared rather with respect to their possibility of embracing *genius loci* and contextuality through architectural design process.

Table 4: Comparison of green design with regenerative design with respect to their adaptability to the concept of *genius loci*.

	Green Design	*Regenerative Design*
1	Reductionist-mechanistic worldview	Holistic-living systems worldview
2	Over-standardized	Place specific
3	End product based check-list system	Process based integrative system
4	Entrenched and inflexible	Developing and flexible
5	Economic aspects prioritized	Social aspects prioritized

4.2.2.1. Reductionist-mechanistic worldview / Holistic-organic worldview

Whereas current green design practice adopts reductionist approach, regenerative design is based on the holistic approach. As explained earlier, reductionist approach isolates elements from each other in order to understand and solve them separately.[22] On the one hand, this gives the possibility to study each element one by one. On the other hand, this approach may not be always successful in terms of providing solutions for complex issues.

According to Lyle, current practice develops technologies for each part separately since the whole is more complex and less predictable (Lyle, 1994). However, 'it is difficult if not impossible to combine these parts together which usually results as disaggregation' (Lyle, 1994).

Proponents of regenerative design explicitly endorse a holistic approach based on living systems theory and they reject list-based or element-based approaches grounded in reductionism (Tainter, 2012). According to American anthropologist and historian Tainter;

> The problem with the reductionism is not reductionist science itself. Reductionist science is both common and necessary. The problem is how few scientists recognize the limits of reductionism.
>
> (2012,372)

Although reductionist science has its own strengths such as solving uncertainties existing in regenerative design, it also has limitations. The proponents of regenerative design do not radically controvert reductionism. But they receive help from reductionist approach when it is necessary, such as making lists and tables, keeping in mind the limitations of reductionist approach (Pedersen Zari, 59;

[22] As recommended by Descartes, any complex phenomena shall be dismantled to its components so that their characteristics could be revealed according to this approach.

Svec et al., 87-90; Cole et al. 97-99; Plaut et al. 118). They do recognize the limitations and constraints of reductionist approach and therefore mostly rely on the holistic approach. With these terms, regenerative design deals with not only each part of the system but also the system itself as a hole.

Whole systems thinking is more likely to engage with contextuality since it is based on considering and dealing with multiple factors at the same time. Because *genius loci* is composed of multiple factors as discussed earlier, only a comprehensive and holistic understanding could successfully integrate its dynamics to the design. The formulaic approach of green design, which is based on rating systems today, is relied on the aggregation methods for the assessment. Based on the holistic approach, regenerative design aims to *re-aggregate* from the building scale to the city scale and is capable of offering solutions for larger scales. It is indicated that 'a regenerative city brings its varied activities together to share space, reinforce each other' (Lyle, 1994, 335).

4.2.2.2. Over standardized / Place specific

A vital point to mention exists with respect to the issue of place. Today's green building rating systems lack adopting themselves to the regional distinctions and cultural differences as discussed earlier. Green building practice, based on these rating systems, lacks the specificity and social-ecological engagement because of this reason.

Regenerative design, on the other hand, is initiated and developed on the notion of place-specificity and cannot exist in isolation from its context. Papers on regenerative design and the frameworks developed for supporting it frequently attributes to the notion of place (Lyle, 1994; Thayer, 2003; Reed, 2007; Cole, 2012; Mang & Reed, 2012b; Pedersen-Zari, 2012).

Reed draws attention that a reconnection to place would help foster the shift to regenerative design and it is crucial to have of 'an essence, or core, understanding of the unique character of the place the' (2007, 677-678). He mentions the concept of 'developing the story of a place' and that it is crucial to understand 'the historic and present patterns of human and earth system relationship' (Reed, 2007; Reed 2006, 12).

Regenerative design accepts and promotes place as the primary starting point for design and connecting people back to the the spirit of place in a way that they are vitalized by it and become intrinsically motivated to care for it (cole, 2012a; Mang, 2009, 5). Moffatt and Kohler suggests that in order to sustain socio-ecological system in a place, it is crucial to integrate the history of nature with the history of human culture (2008), namely, layers of *genius loci*.

As one of the prominent advocates of Regenerative design, Thayer suggests that 'Immersion in bioregional culture and attachment to a naturally defined region offer a deepened sense of personal meaning, belonging, and fulfillment in life' (2003, 71). This reflects the importance that the proponents of regenerative design give to the identity of man related with the place-attachment discussion. He further stresses out that regenerative design is 'place centered in that it reverses the contemporary tendency of the dominant culture and economy to become global, consolidated, remote and alien' (Thayer, 2003, 72).

Regenerative design highly corresponds with the understanding of *genius loci* since it involves a 'reconnection to the historical, cultural, ecological, and economic patterns of a place' (Mang, 2009, 8). While it aims achieving this goal by ecological terms, integration of *genius loci* may help it to expand its limitations. The concept of *genius loci* also requires the design to add value to its specific place, contribute to its *genius loci* instead of just mimicking the existing. In these terms, *genius loci* is highly compatible with regenerative design.

Also, most of the frameworks developed for regenerative design originates from the notion of place and uniqueness (Cole et al., 2012; Plaut et al., 2012; Mang & Reed, 2012a). Identifying site characteristics and environmental opportunities is the key strategy for most of the frameworks developed for regenerative. These frameworks can be considered as successful attempts in terms of integrating place-specific understanding to regenerative practice. This gives opportunity to improve the place concept within the new paradigm as well as providing a degree of flexibility in each framework developed for regenerative design.

On the other hand, today's green design practice remain insufficient in terms of place-specific design as discussed in Chapter 1. Since regenerative design adopts a place-based approach and focuses on adding value to the place, it is more likely to develop a conceptual framework integrating *genius loci*.

4.2.2.3. End-product based check-list system / Process based integrative system

Related with the previous entry, another important comparison exists between the process and the project phase. It was discussed that green building rating tools such as LEED and BREEAM are mostly 'product-based'.

However, the process itself is the main concern for regenerative design. Plaut, Dunbar, Wackerman, & Hodgin (2012) draws attention to the process-based nature of regenerative design. It is also emphasized that 'the design process draws from and supports continuous learning through feedback, reflection and dialogue' (Reed, 2007, 677). All the frameworks developed for regenerative design aim directing the process and helping the design team and stakeholders (Hodgin, 2008; Mang & Reed, 2012; Cole et al. 2012; Plaut et al. 2012).

Considering that it is mostly the pre-design and design phase that *genius loci* could be interpreted to the project, it is possible to state that current green

design paradigm are not likely to adopt the ideals of *genius loci*. Context-depended design can only be achieved through integrated process as regenerative design pays emphasis on.

4.2.2.4. Stereotyped and inflexible / Developing and flexible

It was discussed that the green design could be limited when it is based on rating tools which lack the required flexibility to adopt themselves to different projects. Regenerative design, on the contrast, is open, emergent, and adaptive. It requires different and complementary approaches to discussing 'success' than those currently deployed in green building performance assessment (Cole et. al. 2012, 100). It is defended that the profits of a building cannot simply measured by check-list systems which inholds too little flexibilities to adopt themselves to different conditions and situations. Since every design problem is unique, tools for discussing a regenerative design project shall contain much more flexibility and adoptability. Even the frameworks and processes developed for regenerative design are not fixed, end steps. They are rather 'more like an evolutionary spiral' (Reed, 2006, 10).

4.2.2.5. Economic aspects prioritized / Social aspects prioritized

Most of the studies and publications on green buildings are depend on the costs-saving and financial issues. Discussions usually focuses on quantitative benefits of this green trend. By their score-based nature, LEED, BREEAM and other green design accreditations may sometimes force architects and stakeholders to primarily focus on technical and economic systems in the design and construction process.

Integrative nature of regenerative design, on the other hand, allows engaging social aspects by community engagement. From a regenerative

perspective, the community and the place are integral sources of information whereas green design tools offer little importance to these aspects because of is score-focused racing system. Regenerative design does not only focuses on the economic aspects and energy savings of the building industry, but it also pays a great deal of attention to the user factor, all the living entities, and ecosystems.

It also employs a collaborative process between various types of disciplines required for the projects. It encourages the participation of community members from the initial design steps to the realization and operating process. With this approach, regenerative design aims to establish stronger relationships between the users and the built environment.

4.3. Parameters of the Practice

4.3.1. Frameworks developed for regenerative design

Specific studies on regenerative design and development has raised in the last few decades. Landscape architects Robert Thayer and John T. Lyle and architect William McDonough are earlier proponents of regenerative design and they have published significant works (Lyle, 1994; McDonough & Braungart, 2002; Thayer, 2003). As observed by Hodgins, Lyle mostly focuses on ecological components of regenerative design while Thayer focuses on socio-cultural aspects and McDonough on economic aspects (2006). Probably because of their background, their attempts to put regenerative design into practice was mostly focused on landscape design strategies (Hodges, 2006). In the last years, on the other hand, the topic of regenerative design has started to garner interest from different spheres. Therefore, theoretical studies as well as practical solutions has accelerated. There are ongoing studies and efforts in order to make regenerative design more feasible.

A remarkable group, working on leveraging regenerative design, includes architectural practitioners, Busby, Guenther, Briney and academicians Cole, Blaviesciunaite, and Alencar works on developing a framework and initiating regenerative projects.[23] They aim this framework to permit the principles of regenerative design and development to generate dialogue, between design team and between the architects and the clients, that goes beyond the limited discussions of green design and identify positive synergies (Cole et. al, 2012).

Figure 12: Regenerative design place diagram. (Cole et al., 2012, 99).

[23] Raymond J. Cole, Aiste Blaviesciunaite, & Tatiana Alencar – School of Architecture and Landscape Architecture, University of British Columbia
Peter Busby, Robing Guenther, & Leah Briney – Perkins + Will
Perkins+Will is a global architectural design firm having over 1100 LEED-accredited professionals and 24 offices worldwide. Considering their experience in the field, they can be accepted as one of the authorities in green design practice and a remarkable contributor to regenerative design (Cole et.al. 2012). See http://perkinswill.com/.

One of the outstanding features of this framework is that it accepts and emphasizes the fact that all the human beings and ecological systems are derived from the specificity of place (Figure 12). This diagram explicitly represents the main mindset shift of regenerative design where each system is represented to be interdependent with each other.

Another important framework developed in order to support regenerative approach is LENSES framework which aims providing on-going guidance for flexibility and contextually appropriate solutions (Hodgin, 2008; Plaut et al. 2012). This framework is not only important because of focusing on the context, but also in paying emphasis to provide meaningful integrative process and creating dialogue. It is obtained by laying down different lenses in a way that they can rotate and allow different relationships and interpretations (Figure 13).

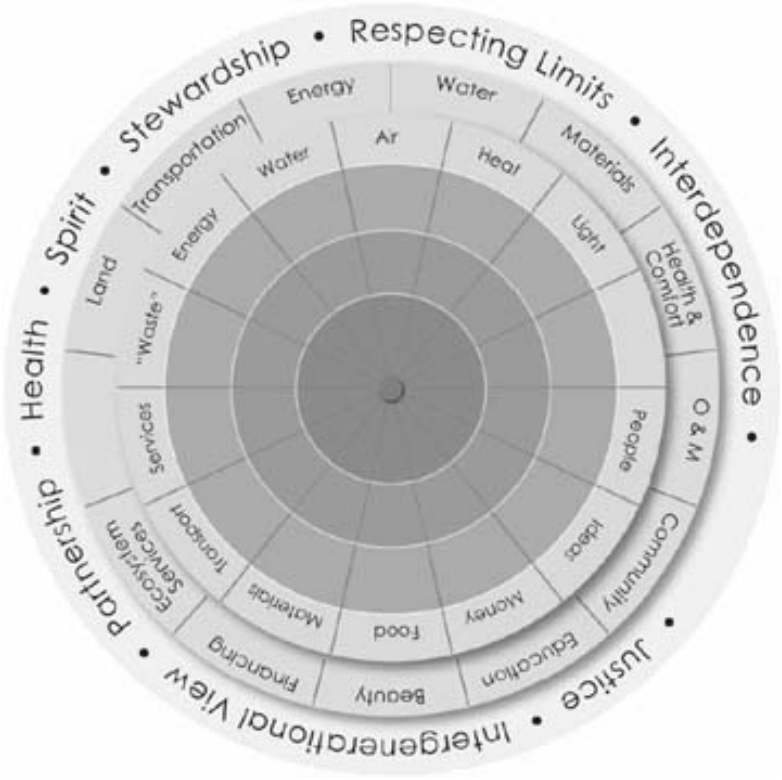

Figure 13: LENSES Framework (Plaut et al., 2012, 116)

Third framework is developed by Mang & Reed (2012). In the paper *Designing from place: a regenerative framework and methodology,* a three-tier system for design methodology, the tiers of which are *guiding premises & concepts, framework, technologies & methods* are introduced (Figure 14). Tier two, the framework, reflects that the design process begins with understanding the place (Figure 14). This understanding of place which is common in all frameworks can be expanded to include understanding the *genius loci* of a place.

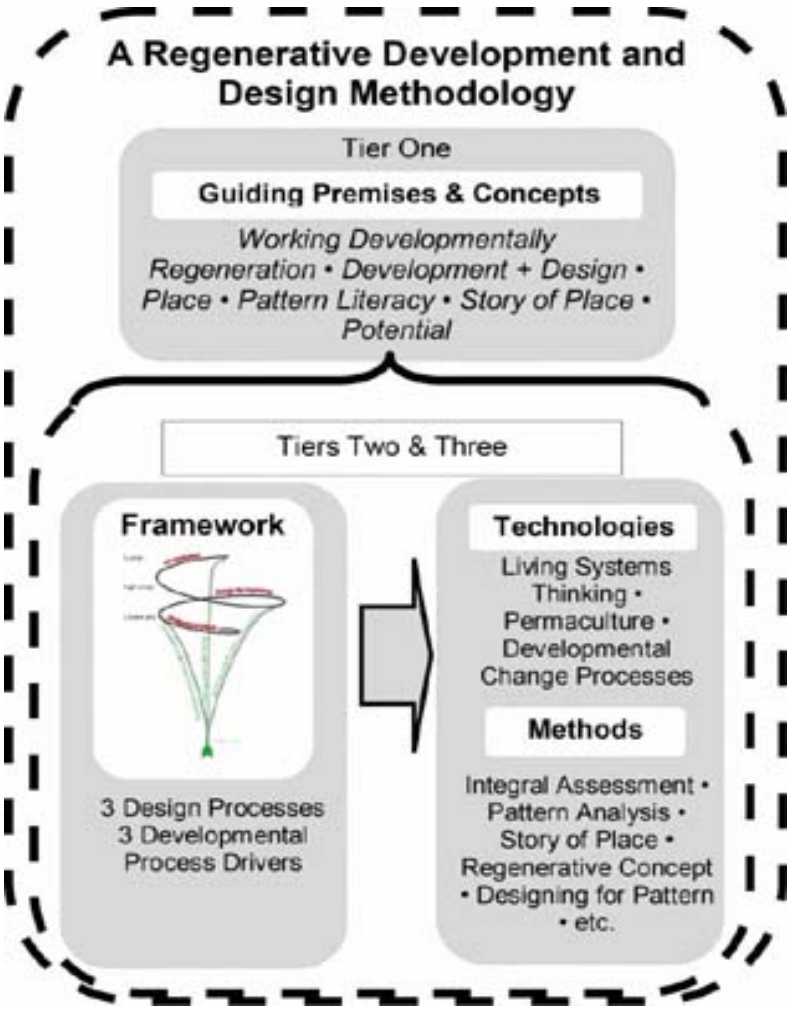

Figure 14: A Regenerative Development and Design Methodology (Mang & Reed, 2012, 25)

4.3.2. Case Study: VanDusen Botanical Garden Visitor Center

The Visitor Center of VanDusen Botanical Garden in Canada (Figure 15) is chosen as an example of a regenerative design project in order to analyze the ideals of regenerative design, discussed through this chapter, on a built example. It also reflects that the conceptual basis of regenerative approach is very consistent with the *genius loci*.

The Visitor Center is designed by Perkins + Will Architects. Completed in 2011, this 1784 m2 building has both LBC certificate and LEED Platinum certificate (Perkins & Will, 2015).[24] Also awarded by various institutions because of its environmentally sensitive design qualities.[25]

Figure 15: VanDusen Botanical Garden Visitor Center (http://perkinswill.com/sites/default/files/styles/pw_hero_image/public/project-imagery/VanDusen_AA.513.012_main_0.jpg?itok=CUjrh3ky, Retrieved July 16, 2015).

[24] It is also the first building applying LBC in Canada.

[25] The Awards:
World Architecture News (WAN) - Sustainable Building of the Year, Winner, 2014
2013 Wood WORKS! BC Wood Design Awards - Wood Innovation Award, 2013
World Architecture News - Engineering Award Winner, 2012
Architectural Institute of British Columbia - Lieutenant-Governor of British Columbia Merit Award, 2012
(Perkins & Will, 2015)

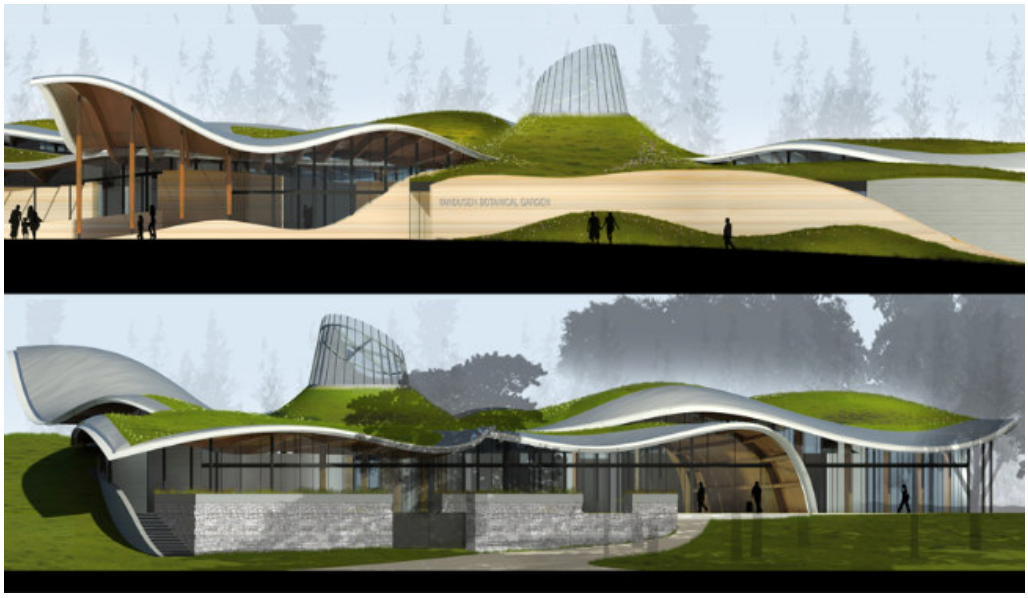

Figure 16: Elevations of VanDusen Botanical Garden Visitor Center (http://assets.inhabitat.com/wp-content/blogs.dir/1/files/2010/09/VanDusan-Botanical-Garden-Centre-1.jpg Retrieved July 16, 2015).

Figure 17 (left): Exposed structure of VanDusen Botanical Garden,
Figure 18 (right) : Atrium of VanDusen Botanical Garden (http://www.robaid.com/wp-content/gallery/arch1/vandusen-botanical-garden-visitor-centre-3.jpg, Retrieved July 16, 2015)

The project seeks to create a harmonious balance between architecture and landscape, from a visual and an ecological perspective. Closely linked with its specific place inside a botanical garden, the free-form of the project is said to be metaphorically representing undulating petals (Figure 17). The building is situated to avoid destroying the existing rare trees and plants. It reflects the place-specific approach of regenerative design against over-standardized nature of green design.

The operable central oculus on top of the building provides daylight to the building as well as creating an atrium space inside (Figures 17, 18, 19). It also features an aluminum heat sink, which converts sunlight into convection energy, providing air movement through the space (Perkins + Will, 2015).

By examining the roof, many of the environmentally sensitive and innovative design strategies can be addressed. The roof is actually designed like an extension of the garden. Stating that it supports local endangered butterfly species, the roof garden also replaces the vegetation displaced by the building itself and helps reintegrate vegetation into the architecture (Cole et al., 2012). It is connected to the ground with a vegetated land ramp to encourage use by local wildlife as well (Busby et al., 2011)(Figure 20). Such use of green roof can be regarded as a conscious integrated design strategy derived from the necessities of the place, unlike those look like attached at the end just to gain more LEED points.

Figure 19: Green roof of the visitor center (Perkins + Will, 2015)

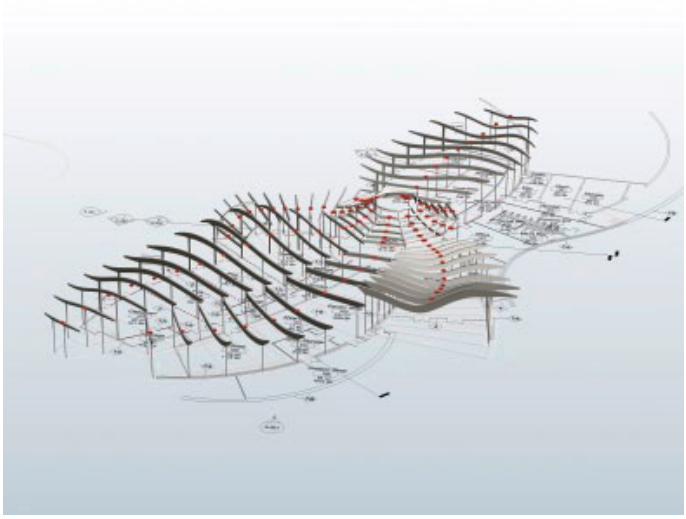

Figure 20: Wooden roof structure of the visitor center (Busby et al., 2011, 97)

Figure 21: VanDusen Botanical Garden Visitor Center (Perkins + Will, 2015)

Moreover, its exposed structure shows one of the innovational aspects, the use of wood as the primary structural material for the organic shape of roof, instead of using concrete or steel (Figure 18, 19, 21, 22). It was considered that the wood can easily found in the region and harvested sustainably, and also it can store carbon dioxide. The foundation and bearing walls are made of concrete, a highly thermal mass, allowing for the building to absorb heat during the day. The innovative use of materials also reflects the flexible nature of regenerative design against memorized, entrenched appliances of green design.

As other energy saving strategies, building uses on-site, renewable sources, such as geothermal boreholes, solar photovoltaics and solar hot water tubes, in order to achieve net-zero energy on an annual basis (Perkins + Will, 2015). The aim was to keep the building at least at net zero energy state. Rainwater is collected, filtered and used as greywater for the building. 100% of blackwater is treated by an on-site bioreactor and released into a new feature percolation field and garden. The building can actually be considered as giving back rather than taking from the site. This also illustrates the holistic perspective of the project, focusing on larger-scale water and resource usages.

The design and implementation project of the process lasted 5 years (Busby wt al., 2011). It is declared that the collaboration with academic institutions, ecologists and a research team including stakeholders from the community members enabled the shape design strategies based on the specific conditions and the characteristics of the place (Busby et al., 2011). The integrated design coordination also enabled the team to meet the budget objectives and dense project schedule (Busby et al., 2011). This project can be accepted as successful as adopting process based integrative system instead of end-product based check-list systems.

The main important point here is the perspective of the design team. As in accordance with the mindset shift discussed in the chapter, the architects asked the question ‘how can this strategy be constructed / applied / designed in such a way that it supports ecological functions and enhances human systems health?’ (Cole et al., 2012), instead focusing how the building can gain more points for the green certificate by add-on elements. The concerns of the design team is not limited only with resource and energy savings but have a broader aspect including social dimensions as well.

Because of the features discussed here, this project could be regarded as one of the examples towards the conceptual shift offered in this study accelerating the proposed strategic mindseft shift.

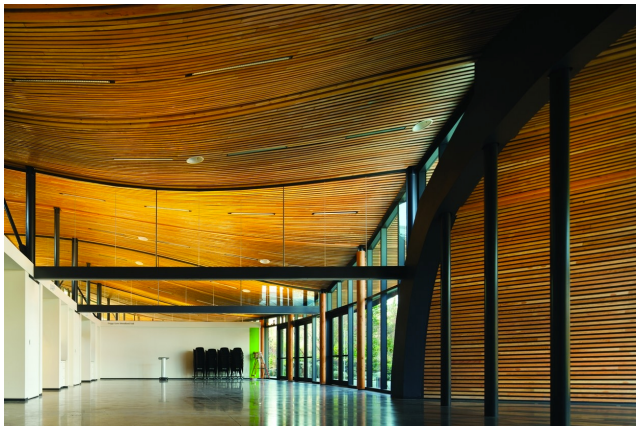

Figure 22: VanDusen Botanical Garden Visitor Center (Perkins + Will, 2015)

Figure 23: VanDusen Botanical Garden Visitor Center (Perkins + Will, 2015)

CHAPTER 5

A CONCEPTUAL FRAMEWORK FOR A MINDSET SHIFT INTERPRETING *GENIUS LOCI* WITH RE-GENERATIVE DESIGN

5.1. Basis of the framework

Environmentally sensitive design is a multi-faced approach and requires dealing with many variants simultaneously. Because of the reasons discussed throughout the study, it is evidential that there is a need for a more comprehensive, sophisticated, multi-dimensional framework which combines quantitative with qualitative data.

A strategic mindset shift, in these terms, is vital for transforming the design practice from the check-list based, certification oriented nature to an environmentally sensitive, context oriented integrative process. Instead of trying to sue the tears of the existing system, developing a new conceptual basis will fasten the process of integrating contextuality, the main missing chain, to the environmentally sensitive design practice. The important point here is to create a substantial basis which is capable of offering miscellaneous solutions and open to developments.

Being an evolutionary spiral, the concept of regenerative design has the potential to go beyond landscape-focused practice. In order to realize this potential, *genius loci* may be the key aspect for regenerative approach to overcome its constraints. These two approaches, *genius loci* and regenerative design, may feed each other for developing an effective design framework for the architectural practice. Since they both rely on similar principles as discussed

earlier, *genius loci* and regenerative design can evolve together for adding value to the place.

The initial point of emergence for regenerative design was the idea that 'it is possible to develop buildings and cities in such a way that they regenerate lost ecosystems' (Lyle, 1994). Although there are often attributions to place-sensitivity and human factors, studies on regenerative design mostly focuses on ecological problems. However, in order to provide solutions in the field of building industry, one has to integrate these ecologically successful solutions with architectural strategies. It could be interpreted that this architectural side is missing to a certain extend in the publications and studies about regenerative design.

The frameworks developed for promoting regenerative design can be considered as successful attempts in terms of integrating place-specific understanding to regenerative practice. However, they offer little guidance in the way that *how place-specificity and place-attachment are going to be satisfied in architectural terms*. Rather, they mostly focus on the ecological background and material flows of a given site. For designing in harmony with place, usually they point out methodologies based on bio-mimicry or permaculture (Mang & Reed, 2012b).

This is mainly due to the fact that regenerative design is quite new compared to the current green building trend and there are not enough studies on regeneration yet. It still has a high potential in that it accepts the necessity for place-specific design although the notion of place and the issue of *what to do with the place* has not been matured yet in regenerative design. Regeneration concept opens room for further discussion and elaboration on place. This gives opportunity to improve the place concept within the new conceptual basis as well as providing a degree of flexibility in the frameworks to be develop.

There is accumulated experience in mainstream green design practice. Yet, regenerative design is very open to enhancements and studying out its potential applications. At this point, regenerative design arises some questions on which aspects of the current paradigm could remain their validity and which kind of strategies are required in the new paradigm to be shifted. Within this process, 'it is important to emphasize that existing green building technical knowledge and strategies remain both valid and necessary', but they are now required to be 'set within a broader and social and ecological context' (Moffatt and Kohler, 2008).

The solution lies in the engagement with *genius loci*. The success of architectural design shall not be limited with the *ecological regeneration* but it should also take into account the *contextual regeneration*. Therefore, this interpretation should be emphasized by working on the connection between them.

Authors studying regenerative design mention about 'the careful reading of the landscape of place' (Reed, 2006), but it has to be complemented with 'the careful reading of the *genius loci* of the place' as well. They usually offer biological readings and solutions in order to create placebo effects by finding 'the leverage points, those key intersections where small interventions can energize the system as a whole' (Reed, 2006, 12). This placebo effect could also be considered in terms of architectural practice. Key interventions for a place may energize its *genius loci* as well.

With this regard, the layers of *genius loci*, human context and natural context, should be integrated with the ideals of regenerative design. The integration should start from the beginning of the process to the implementation phase.

In order to support this process, a four-staged conceptual framework is created in the light of analysis and discussions held on these two. The framework aims to enrich the dialogue between the project, its surrounding, and users. The most crucial point about the framework is that it requires not a change of techniques but a change of minds. Regarding this, the new way of thinking is not only about how buildings are planned, designed, constructed and operated but also about the roles of the designers and inhabitans (Mang & Reed, 2012). It draws emphasis on the participatory and co-creative integrative process.

As commonly stated, since the most important design decisions take place in the very early stages, early collaboration of specialists is vital for the environmentally responsible designs (Kohler, 1999; du Plessis, 2012). The integrated design process, therefore, can be referred as the core of creating environmentally responsive buildings.

Participation of the community is a crucial step during the integrated design process. Not only the specialists in the design team but also early participation of users and other people from the neighborhood can contribute significantly to the project since they are going to be effected most from the end-result. The collaborative process is also important for discovering the social-ecological stories of a place. This participatory process helps the design become a natural part of the daily life instead of a closed loop forced to the place. In this way, the participatory process will also establish a sense of connection to surrounding community systems.

In the light of the discussions held so far, the main characteristic of the framework should be flexibility, having the ability to adopt itself to different contexts. Therefore, a place-specific approach is embraced as the core of the framework offered in this chapter.

The background of this framework included previous studies and methodologies developed for regenerative design. A critical adoption of earlier systems provides a systematic development in the field.

5.2. Stages of the framework

In this part, the four-staged conceptual framework is illustrated on a simple diagram (Figure 24) and each of the stages in the diagram is explained briefly.

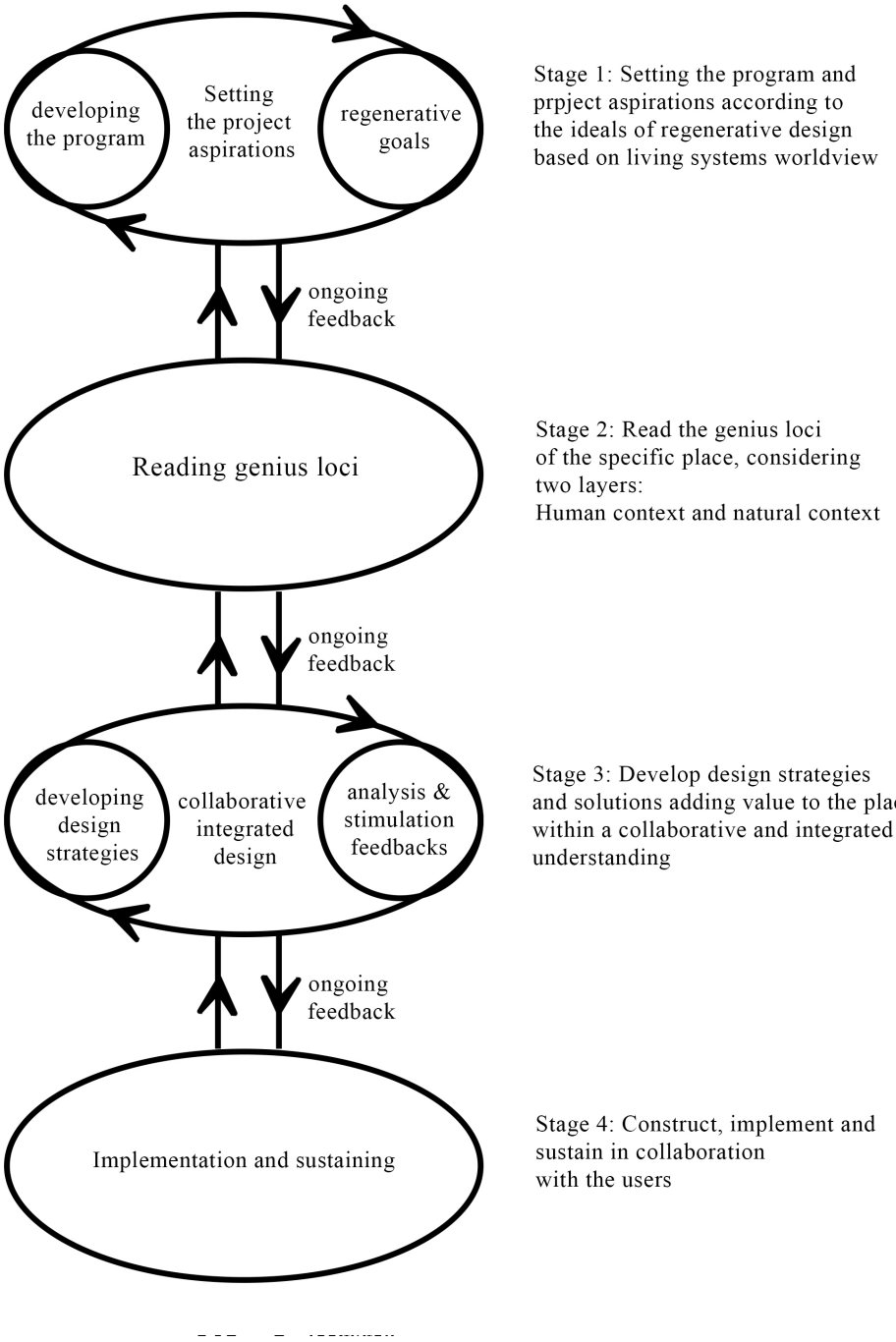

Figure 24: Diagram of four-staged conceptual framework for environmentally sensitive projects

5.2.1. Stage 1: setting the principles and targets

The process should always begin with a simple and manifest of principles and initiatives of the project based on a living-systems worldview. Defining the main targets and the ideals which are aimed to be achieved by this projects should be well-defined in order not to loose this basis at the following parts of the project.

> Each time design practitioners select a particular set of methods and texhniques to addressing a design problem or to measure and evaluate the solution, they express, implicitly or explicitly, what they believe is the ethically appropriate way to work based on their worldview complex.
>
> (Mang & Reed, 2012, 25-26)

Although it is usually neglected or skipped in the current practice, the importance of Stage 1 lies under this fact. Setting the goals, principles and main philosophy of the design is of crucial importance. They can be regarded as the compass of the project, beckoning the right direction throughout the process. This stage brings the stakeholders to a broader perspective rather than merely focusing on green labels. With the absence of this stage, projects are diminished to a set of technical solutions.

When the worldviews and the initiatives are conscious, they provide guidance 'in regard to evolving the self engaged in the doing as well as the doing itself' (Krone, 1992, 3-4, cited in Mang & Reed, 2012, 26).

The principles and ideals set in the stage 1 should should include but are not limited with aspects such as place-specificity, context-depended approach, reinforcing the sense of place, living systems understanding, holistic thinking, collaborative and integrated work, regeneration, obtaining net positive building

when the circumstances are appropriate, economy, taking into consideration the user perception and health and well-being; both physically and psychologically.

The utmost aim should be organizing human activities, by means of architecture and construction, so that they continuously feed and are fed by the living systems within which they occur. Aiming the continual evolution of culture in relationship to the evolution of life should be pursued at all stages.

5.2.2. Stage 2: reading the *genius loci* of the place

The second stage aims to gather information about the place in order to understand the master pattern of the specific place or region that the project is going to be constructed or implemented. It requires approaching the place not merely as a collection of things such as slopes, roads and buildings, but as 'webs of interconnected dynamic processes that are continuously structuring and restructuring it' (Haggard, 2002, 25 cited in Mang & Reed, 2012, 26).

The place-specific insights also give the design team important information in order to guess the potential of the place and make predictions about the future scenario.

> Discovering the story of a place enables one to understand how living systems work on that place, and provides greater intelligence about how humans can then align themselves with that way of working to benefit of all.
>
> (Mang & Reed, 2012, 30)

This stage aims to go beyond the conventional and narrow scoped site analysis, which usually concentrates on a quick analysis of immediate physical characteristics such as topography and the buildings in the surrounding, by taking into consideration of the two layers of *genius loci* proposed in chapter 3.

It was discussed that the first layer of *genius loci*, human context, includes historical existence, social and cultural existence, and psychological, ontological, cognitive existence. The second layer of *genius loci*, natural context, includes living entities and physical characteristics of ecological environment.

This two layered reading enables the design team to understand the inner-work of ecosystems as well as societies. Understanding the context relationship between different systems – inside the natural ecological context, and human context as well as their relationship between each other – is crucial in this respect.

Reading the patterns of the place requires the reading of not only tangible aspects but also intangible ones as explained earlier. With this regard, inclusion of a broader sets of expertise as well as stakeholders from the local community to the design process is important.

According to the information obtained from the reading of *genius loci*, new possibilities of the place could be recognized or it may reveal that some of the project initiatives may not be realized. Therefore, the first two stages may sometimes shape each other around feedbacks and new available information, as indicated in the diagram of the four-staged conceptual framework (Figure 24)..

5.2.3. Stage 3: developing design strategies and solutions

This stage includes developing design strategies in order to make a contribution to the *genius loci* by using the same principles and the data obtained from the previous stages.

Designing in harmony with the place requires recognizing that each place is a dynamic entity with its own unique history and future – growing and

evolving, forming and decomposing, continuously influenced by the larger system in which it is embedded (Mang & Reed, 2012, 31).

Most important characteristic of this stage is the integrated and co-creative work, explained at the beginning. Community and stakeholder dialogue started in the second stage should continue in this process. Who is going to inhabit the place, the ways that they can collaborate with the team and contribute to the project is essential during this stage.

All aspects related with architecture including form, language, material, techniques, spatial organization should be decided by using the data obtained from previous stages. Technical solutions are also a part of this stage. Using appropriate technologies best suiting that specific project is important. Considering the unique essence of the place, energy efficient strategies such as use of solar panels, underground heat pumps, wind turbines, rainwater harvesting systems, water treatment, waste recycle should be decided within this integrative process so that the best result can occur with feedbacks between different disciplines.

After translating the patterns of *genius loci* into design guidelines, conceptual design, and technical solutions it is again important to get ongoing feedback, as stated by Reed, 'a conscious process of learning and participating through actions, reflection and dialogue' (2008, 678). According to this feedback, stage 2 and stage 3 also shapes each other through design process.

5.2.4. Stage 4: constructing and sustaining

After the desingn process is completed, most of the architects considers their work as done. However, this new conceptual framework created with the interpretation of *genius loci* and regenerative design, requires them to continue

working in the implementation process as well in order for a successful realization and sustainability of the project.

This stage also requires the collaborative work of the design team and the inhabitants, including the education of the inhabitants. In this way, environmentally sensitive projects may contribute not only to the ecological well being and architectural progress, but also the education of the community members for raising awareness as well.

Since the users are going to be responsible mostly from the operating level, they may play an important role for the sustainability of the project. Therefore, engaging stakeholders form the community is of vital importance not only for understanding of the place but also for sustaining the place.

Unfortunately, today in a typical design process, designers may neglect the necessity of stage 1 and to by skipping to the stage 3 directly. The first two stages are either reduced to a shallow standart site analysis or completely ignored. Especially the projects merely aiming to get green certificates directly focuses on gaining more LEED points mostly by technical systems added to the project at the end.

However, this framework requires a detailed and careful examination of the place by reading the layers of *genius loci*. Not only the examination of natural-ecological context but also the examination of human context, which is composed of historical, social, economical aspects is vital for the proposed conceptual shift. This examination provides the history of a place, which is the very essence of that specific place, what makes that place distinct and unique from the others. Local materials, construction techniques, built environment and architectural characteristics shall be read and evaluated through the design process.

It could be interpreted that the inclusion of a phenomenological approach together with the other realities of site is the main contribution of this framework. The focus point shall be shifted to the qualities of the design instead of merely technical add-ons. With this regard, the re-consideration of *genius loci* will provide remembering the key stone values of architecture and interpreting contextuality to the ecological practice which has been long going after points-chasing and labelling.

Instead of earning more points, the process itself should be emphasized since it is the most critical point in terms of adapting a *genius loci* based architectural approach respecting the qualities and the uniqueness of the place.

This framework, emphasizing place-specific insights, is a conceptual alternative to ready-made template design solutions. It is evolutionary in its nature and open to further developments.

This study aimed to provide this conceptual shift in terms of raising the concept of *genius loci* on the basis of regenerative design. The interpretation between them may suggest fertile solutions for the architectural field so that the regenerative design may go further than an ideal focusing on ecology, and *genius loci* may find an appropriate basis to be reconsidered in today's architectural practice.

CHAPTER 6

CONCLUSION

In this study, the current environmentally sensitive practice and its problems are discussed. It should always be kept in mind that environmentally sensitive design is a multi dimensional approach covering various aspects. However, mainstream current green design approach is mostly based on the inappropriate adaptation of rating systems as design tools. Therefore, tackling limited issues with a fragmented scope, it remains inadequate in covering the multi dimensional aspects of sustainable design.

Because the rating systems are the main factors leading the ecological studies in the architectural and constructional field, the overall practice is based on this insufficient system. Together with other factors, this globalized insufficient system created buildings which are ‘green labeled’ but not ‘context labeled’.

This study revealed the necessity of a strategic mindset shift in order to bring a new vision to the problem and create a better functioning basis drawing on ecological theory and practice. The new conceptual basis requires a contextually aware way of building. This context-depended understanding is promoted by means of a reconsideration of *genius loci* together with regenerative design, a different kind of ecological paradigm, for the current conditions of practice. This new paradigm characterizes human beings and nature as interrelated parts of the same entity, instead of situating humans as a dominant force over nature.

A new conceptual framework is created for the design and realization process of projects, driving forward the necessity of collaborative, interdisciplinary integrated process including stakeholders from the community members as well. The framework is based on the specific character of places and focuses on the situation within a given context. Based on the regenerative design paradigm, the framework demonstrates ways to include social and phenomenological dimensions to the solution by reading and interpreting the place according to the layers of *genius loci*.

In this point, it is also important to pay emphasis to the relevance of the problem in terms of urban scale. While sustainable architecture and ecological design have been concentrated vastly, the problem mostly remained at the individual building scale. The issues surrounding sustainability of the cities also needs to be developed with the basis discussed through this study.

Since cities are integral parts of the natural world, it is essential to improve how this kind of conceptual frameworks could work in dense urban settlements. The cities and all the settlements at different scales should be regarded as undetachable systems evolving within the nature. Therefore, ecological and sustainable solutions should be promoted also for urban scale, instead of a piece by piece problem solution process. This starts with recognizing that every individual, living identity, matter, and entity on the earth are interdependent parts composing a whole.

The efforts taken in the field of environmentally sensitive architecture are quite important and promising. However, they need to be developed by making a shift with visionary, complementary and alternative approaches. The crucial point is grasping the broader scale of the situation and adapting behaviors and settlements of the overall human existence on earth to the environment.

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APPENDIX A

A SUMMARY OF BREEAM UK NEW CONSTRCTION TECHNICAL MANUAL 2014

Building life cycle stages covered by the BREEAM UK New Construction 2014 scheme version

This BREEAM UK New Construction Scheme can be used to assess and rate the environmental impacts arising from a newly constructed building development (including external site areas), at the following life cycle stages:

1. New Build Design Stage (DS) - leading to an Interim BREEAM rating and certificate of assessment

2. New Build Post-Construction Stage (PCS) – leading to a Final BREEAM rating and certificate of assessment

Design Stage

The DS assessment and interim BREEAM rating confirms the proposed new building's performance at the design stage of the life cycle. Assessment and ideally certification will occur prior to the beginning of operations on site. The BREEAM rating at this stage is labelled as 'interim' because it does not represent the building's final, new construction BREEAM performance.

To complete an assessment at this stage the design must be advanced to a point where the relevant design information is available to enable the BREEAM Assessor to evaluate and verify the building's performance against the criteria defined in this Scheme Document. The interim DS assessment will therefore be

completed and certified at the scheme design or detailed design stages.

Post-Construction Stage (PCS)

The PCS assessment and BREEAM rating confirms the final 'as-built' performance of the building at the new construction stage of the life cycle. A final PCS assessment is completed and certified after practical completion of the building works.

There are two approaches to assessment at the post-construction stage:

1. A post-construction review (PCR) of an interim design-stage assessment

2. A post-construction assessment (PCA)

A PCR serves to confirm that the building's 'as built' performance and rating is in accordance with the assessment certified at the interim design stage. Where an interim DS assessment has not been carried out i.e. certified, and a BREEAM assessment and rating is required, a full post construction stage assessment can be conducted.

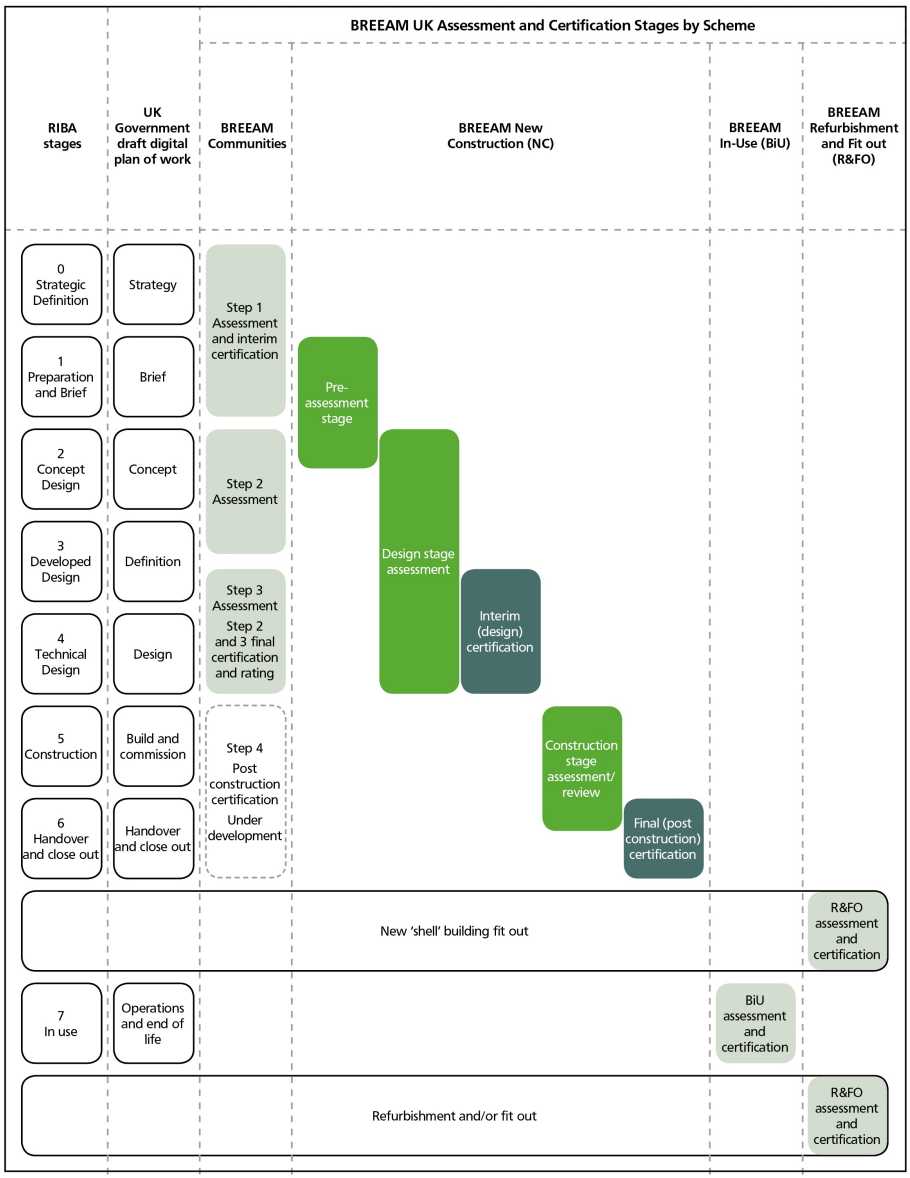

Figure 25: BREEAM assessment and certification stages and the Royal Institute of British Architects (RIBA) Outline Plan of Work 2013

BREEAM 2014 New Construction environmental sections and assessment issues

Management:

Project brief and design

Life cycle cost and service life planning

Responsible construction practices

Commissioning and handover

Aftercare

Health and wellbeing

Visual comfort

Indoor air quality

Safe containment in laboratories

Thermal comfort

Acoustic performance

Safety and security

Energy:

Reduction of energy use and carbon emissions

Energy monitoring

External lighting

Low carbon design

Energy efficient cold storage

Energy efficient transportation systems

Energy efficient laboratory systems

Energy efficient equipment

Drying space

Transport

Public transport accessibility

Proximity to amenities

Cyclist facilities

Maximum car parking capacity

Travel plan

Water:

Water consumption

Water monitoring

Water leak detection

Water efficient equipment

Materials:

Life cycle impacts

Hard landscaping and boundary protection

Responsible sourcing of materials Insulation

Designing for durability and resilience

Material efficiency

Waste

Land use and ecology

APPENDIX B

A SUMMARY OF LEED V4 FOR DESIGN AND CONSTRUCTION MANUAL

Table 6: LEED NC credit categories and possible points to be earned from each category

Location and Transportation

LEED for Neighborhood Development Location	16
Sensitive Land Protection	1
High Priority Site	2
Surrounding Density and Diverse Uses	5
Access to Quality Transit	5
Bicycle Facilities	1
Reduced Parking Footprint	1
Green Vehicles	1

Sustainable Sites

Construction Activity Pollution Prevention	Required
Site Assessment	1
Site Development--Protect or Restore Habitat	2
Open Space	1
Rainwater Management	3
Heat Island Reduction	2
Light Pollution Reduction	1

Water Efficiency

Outdoor Water Use Reduction	Required
Indoor Water Use Reduction	Required
Building-Level Water Metering	Required
Outdoor Water Use Reduction	2
Indoor Water Use Reduction	6
Cooling Tower Water Use	2
Water Metering	1

Energy and Atmosphere

Fundamental Commissioning and Verification	Required
Minimum Energy Performance	Required
Building-Level Energy Metering	Required
Fundamental Refrigerant Management	Required
Enhanced Commissioning	6
Optimize Energy Performance	18
Advanced Energy Metering	1
Demand Response	2
Renewable Energy Production	3
Enhanced Refrigerant Management	1
Green Power and Carbon Offsets	2

Materials and Resources

Storage and Collection of Recyclables	Required
Construction and Demolition Waste Management Planning	Required
Building Life-Cycle Impact Reduction	5
Building Product Disclosure and Optimization - Environmental Product Declarations	2
Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
Building Product Disclosure and Optimization - Material Ingredients	2
Construction and Demolition Waste Management	2

Indoor Environmental Quality

Minimum Indoor Air Quality Performance	Required
Environmental Tobacco Smoke Control	Required
Enhanced Indoor Air Quality Strategies	2
Low-Emitting Materials	3
Construction Indoor Air Quality Management Plan	1
Indoor Air Quality Assessment	2
Thermal Comfort	1
Interior Lighting	2
Daylight	3
Quality Views	1
Acoustic Performance	1

Innovation

Innovation	5
LEED Accredited Professional	1

Regional Priority

Regional Priority: Specific Credit	1
Regional Priority: Specific Credit	1
Regional Priority: Specific Credit	1
Regional Priority: Specific Credit	1