



TOWARDS SUSTAINABLE ARCHITECTURE CREATION AND EVALUATION PRACTICE: RESOURCE BLINDNESS PHENOMENON AND CHAMELEON PRINCIPLE

Dalia AUGUSTINAITE[✉]

Independent researcher, Vilnius, Lithuania

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Abstract. Sustainable meeting of human needs is contingent upon effective management of resources to address development challenges in qualitative manner, thereby engendering positive change. This issue concerns scientific verifiability of interaction between social and environmental capital. These settings provide the basis for development of universal theoretical framework to address principles of resource diversity in this study. The current study examines extent to which various sustainable development strategies – universal and specific documents, initiatives, collaborations and competitions, and sustainable development assessment systems – align with the aforementioned principles. Results are assumed to be in line with basic principles of art and innovation and therefore architecture, which are either ignored or endorsed. Resource blindness phenomenon and chameleon principle offer novel approaches to defining and explaining the ideas and characteristics of two distinct philosophies of creativity. The laws are crystallized through unprecedented methodology of reconciling natural and human capital characteristics through common and specific meanings described in scientific literature. Comprehensive spectrum of natures, states, types, and principles of sustainable interaction of resources thus formulated provides the universal theoretical framework. Appearance of the principles is then illustrated by architectural case study, thus defining criteria for sustainable interaction of resources in practice. Conclusions are given.

Keywords: chameleon principle, environmental and social capital synergy, matter-energy, physicality–mentality, resource blindness phenomenon, sustainable architecture creation and evaluation, sustainable development strategies, sustainable resource diversity.

[✉]Corresponding author. E-mail: dalia@augustinaite.lt

1. Introduction

According to Kass (2022), Universal Declaration of Human Rights (UDHR) (United Nations, 2025), formulated in 1948, is the first formal set of legally protected characteristics of sustainability for achieving full range of levels of development, referred to as survival principle. This strategy is successor to Bauhaus movement started by Walter Gropius between 1919 and 1933, which was immortalized in numerous architectural solutions. Merz (art style) by Kurt Schwitters is used to convey Bauhaus ideology through “art and architecture by finding inspiration in the constructive potential of materials” as specific “method for going beyond normative practices” (Mindrup, 2014, p. 164); László Moholy-Nagy, in fundamental Bauhaus course on material studies for artists and architects, considered creation of “technical form” as the main goal of architecture (Mindrup, 2014). The initiative and movement of New European Bauhaus (NEB) (European Union, 2025), launched by European Commission in 2020, is upgraded version of Bauhaus. Both philosophies seek to revolutionize technological and,

subsequently, also environmental structures, thereby resolving modern moral quandaries. Many more universal and architecture-specific sustainability strategies, including documents, initiatives, competitions, and commercial tools have been developed over the past 100 years. Although they are complementary and interconnected, they all paradoxically face the same challenges in terms of diversity, which is one of the key principles of sustainability (Mensah, 2019; Hoicka, 2023). Diversity issues are the subject of this study, particularly with regard to (non)inclusion and therefore (non)interaction of different capital natures, states, and types. Accordingly, in practice, such as in architecture, form and materiality of solution (un)necessarily create synergy of inclusive parts. Ma's theory of sustainable development, formulated by Japanese culture, aligns with creative design tendencies of Schwitters and Moholy-Nagy. It states that art or innovation, and thus architecture, is construct of separate, indispensable parts (Kodama, 2017). This statement posits that diversity can manifest in two ways: through synergy of ideology and technology or through technology that is detached from ideology and thus replaceable. In general, studies have demonstrated that both types of creative strategies result in sustainable, qualitative development. However, only those interventions that exclusively target ideo-social abilities and result in positive, *i.e.*, quality-enhancing, outcomes can truly solve sustainability challenges (McDonough & Braungart, 2013). Characteristics of management of such performance are therefore the top priority to be identified by this work, thus explaining the true purpose of architecture. These findings lead to defining the aim of the study as formulating methodology for creation and evaluation of sustainable architecture based on synergy of diverse resources.

In this research, resources are treated as the basic premises to materialize space solutions in architecture. Both environmental and socio-mental capital are considered to have the same ontological status, only appearing in different forms. To explain double meaning of (non)interaction of resources, the author of the publication introduces unique terminology. Resource blindness phenomenon is further elucidated in the study through the lens of structure comprised of singular nature, state, or type of capital, or composite of diverse natures, states, or types of capital that are incongruous, thereby resulting in limitations to development and perpetuation of fixed patterns. Chameleon principle – characteristics of resources in cohesive structure to add value in the most effective way to achieve common and mutual task. The study of sustainability strategies is the key to obtaining results that lead to identification of actual principles and criteria of creativity modes that are illustrated in sustainable architecture case study.

2. Research methodology

Many scientific studies have been conducted on subject of sustainability characteristics in relation to assessment and design methodology. For instance, some studies compare properties of tools of similar nature (Stauskis, 2013; Liu et al., 2019; Rezaallah et al., 2012), while others assume diversification of criteria between various sustainability indexing methodologies (Singh et al., 2012; Pombo et al., 2016). Strategies such as *Living Building Challenge* (Living Future, 2025; Fisher Hesse, 2020), German Sustainable Building Council (Deutsche Gesellschaft für Nachhaltiges Bauen [DGNB], 2025) and Lithuanian Building Sustainability Assess-

ment System (Lietuvos Žaliųjų Pastatų Taryba, 2025) align their criteria with other sustainable development tools, including United Nations 17 sustainable development goals (Sustainability Services. Eurofins, 2025), or subsystems, for example, net positive or life cycle approach. This study aims to identify the core principles underlying equivalence of all the tools in terms of universal meanings of nature, state, and type of resource. Crucial factor is the extent to which the tools align with principle of diversity. In order to elucidate the general characteristics of methodologies, four groups of specific tools are employed: universal and architectural regulations, initiatives, creative challenges (competitions and collaboratives), and building sustainability assessment systems. Six cases included in each group represent diversity with regard to time context. It can be posited that timing may have effect on methodological criteria. The set of strategies employed in each case is preliminary to illustrate range of former and following strategies. Universal characteristics of criteria are elucidated through the study of scientific literature. Specific properties of criteria are then demonstrated through investigation of sustainable development strategies. Resource diversity criteria of interest in this study are as follows: nature, state, and type (see Figure 1):

- 1) Nature. Universal diversification of capital, according to its nature, under sustainability concept, encompasses environmental and social structures (Baweja, 2014; Mensah, 2019). Generally, environmental nature structures can be considered physical medium of universe, including man-made and man himself. In essence, social nature structures are result of human needs, specifically capacity to set goals and achieve them. It includes both ideologies and instinctual decisions as opposed to conscious ones;
- 2) States. They are approached as properties of transformative resources logic. In such a case, states of environmental resources pure technically and in relation with social constructs vary between physical matter and energy (Maties et al., 2019; Mulrow et al., 2023; A. Valero & A. Valero, 2019). Concept of social capital can be defined in range from the basic necessities of survival to more complex processes of thriving (Zhao, 2022; Kass, 2022). In this publication, social states are considered to be alternative criteria for basic and higher achievements, which are aligned with physicality and mentality;
- 3) Types. Types of capital demonstrate classical definition of primary and secondary industrial goods in supply chain for matters, which in terms of publication, accordingly, are named materials (such as timber, water) and (re)materials (e.g., waste and other leftovers of consumption processes, including water) (Zimring, 2016; Trifu & Vestale, 2022). With regard to energy, the tendency can be observed in forms of power (for instance, natural light, heat, ventilation, sound, vibration, including the source, e.g. human movement), and (re)power (power transformation and generation systems, such as electricity plants, electricity itself, including smart use of physical and chemical characteristics of materials to accumulate and release energy) (Blanco & Faaij, 2018; Alajingi & Marimuthu, 2023). Social types of capital encompass broad range of capabilities, including the basic intellectual constructs that ensure availability of essential resources such as food, water, and shelter. Additionally, they encompass number of non-material goods (Pözlner, 2021), some of the earliest lists of basic needs already included education (Drewnowski, 1983; Hicks & Streeten, 1979; Streeten & Burki, 1978), more recent lists include items such as autonomy, self-respect, and companionship (e.g., Copp, 1998;

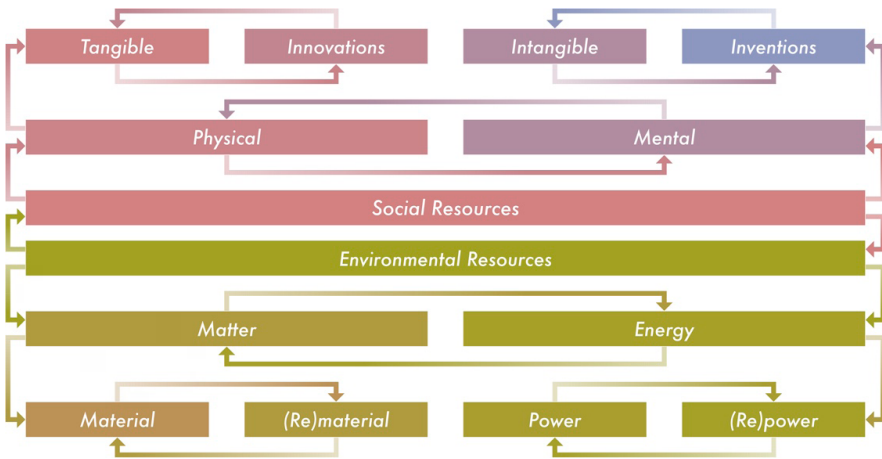


Figure 1. Tree of interconnection between equivalent resources' natures, states, and types (chameleon principle) (source: created by author)

Doyal et al., 1994). The study classifies these factors into two categories: tangible (physiological) and intangible (psychological). Higher capital (capabilities) types are required to invent and subsequently refine methods of science for purpose of human flourishing (Scollon et al., 2003; Woo et al., 2020). In ancient Rome, higher abilities were associated with "liberal arts", which encompassed range of disciplines including but not limited to music, art, architecture, theater, and other cultural pursuits, as well as religious and philosophical inquiry, narrative, and so forth (Pawelski, 2022). Higher capital is defined as comprising two distinct elements – instrumental transformation (innovation) and ideological transformation (invention).

This study does not examine environmental and social resources in parallel as sensory act of creation. Nevertheless, it can be seen that social capital, as defined by authors such as Reynolds (2012) and Allan (1942), is aligned with environmental resources. This is evidenced by interconnectedness of mental (*e.g.*, ideas) and physical (*e.g.*, energy) resources, which occurs as the ability and power to manifest synergy of resources. Further, in the study quality interaction principle will only be illustrated in architectural cases exemplifying chameleon principle, error – in resource blindness. Sustainable management of architectural solution technique is therefore demonstrated simplified (see Figure 1), leaving study in specific peculiarities of the law to future research.

3. Results

A detailed overview of the results is provided below.

3.1. Regulations: universal

Six regulations of universal scope, declared in Table 1, are included in exploration of sustainable resource diversity. From the point of view of priorities given to particular nature

of capital, focus on social criteria alone is consistent with UDHR (United Nations, 2025), on environmental – with Kyoto Protocol to the United Nations Framework Convention on Climate Change (hereinafter – Kyoto Protocol) (United Nations, 1998). All the strategies considered, except UDHR (United Nations, 2025), include all forms of environmental resources. Only Leipzig Charter on Sustainable European Cities (hereinafter – Leipzig Charter) (EU2007.de, 2007) is limited in giving details on reorganized matters, but, for example, wastewater infrastructure, renovation, generally support the type of criteria. Basic standards of health and well-being necessary for sustainability of person's life are based on person's own capabilities (internal capital) or are provided by others (external capital). The regulations place particular emphasis on tangible capital, such as basic needs for shelter, clothing, medical care, safety and security, as defined by UDHR (United Nations, 2025). The 2030 Agenda for Sustainable Development (hereinafter – 2030 Agenda) (United Nations General Assembly, 2015) adds to the list needs of sanitation and hygiene, Leipzig Charter (EU2007.de, 2007) and Report of the World Commission on Environment and Development *Our Common Future* (hereinafter – Report of the World Commission) (United Nations, 1987) – access to food and other resources. All the tools agree on need for innovation and, importantly for the 2030 Agenda (United Nations General Assembly, 2015), entrepreneurship. Yet, UDHR (United Nations, 2025) and Kyoto Protocol (United Nations, 1998) do not comprehensively describe such advanced man-made entities. Innovation is treated as result of higher intangible capital, especially education and scientific research, in all policies, except Kyoto Protocol (United Nations, 1998). In spectrum of intangibles, UDHR (United Nations, 2025) adds dignity, respect, freedom, social and cultural, gender, ideological rights, and enjoyment of arts; the 2030 Agenda (United Nations General Assembly, 2015) – creativity; Agenda 21 (United Nations: Sustainable Development, 1992) – curriculum development, teaching, and training; Leipzig Charter (EU2007.de, 2007) – social inclusion. With exception of Agenda 21 (United Nations: Sustainable Development, 1992), which emphasizes need for “social innovation”, none of the strategies directly supports inventive stage of development. Others, such as the 2030 Agenda (United Nations General Assembly, 2015) and the Report of the World Commission (United Nations, 1987), indirectly refer to need to change human behaviour, especially in terms of consumption. UDHR (United Nations, 2025) states that change of belief is supported, however, as free choice, not necessity (in case of thought, conscience, and religion). Norms that prioritize singular nature of resources are ineffectively include opposite nature – social or environmental – that is inevitable for sustainable anthropogenic development. Documents that respect resources' diversity govern human capacities that affect environment and *vice versa*, pointing to reciprocity of creation.

Two architectural cases were selected to illustrate twofold trend that characterizes inclusion of resources in content of universal regulations discussed above (see Figure 2). BUTterFLY Residential Building (hereinafter – BUTterFLY) (2023), Athens, Greece, is example of extreme focus on ideological issues, such as “moment of urban allusion within the fabric of the city”, “weird unfamiliar object [...] is a strong urban gesture that redefines its context (Topos)”; it is embodied in iconic form, the result of artificial intelligence technologies, – describes online architecture journal *ArchDaily* (2008–2025a). However, technically, in terms of shape of the building and materials used, BUTterFLY is not in synergy with idea, except for principles

Table 1. Evaluation of selected universal regulations related to sustainability (source: created by author, based on United Nations General Assembly, 2015; EU2007.de, 2007; United Nations, 1987, 1998, 2025; United Nations: Sustainable Development, 1992)

Contemporary sustainability management strategies	Nature	Resources classification criteria							
		Environmental				Social			
	State	Matter		Energy		Physical		Mental	
	Type	Material	(Re)material	Power	(Re)power	Tangible	Innovations	Intangible	Inventions
Regulations: universal	Year								
The document <i>Transforming Our World: The 2030 Agenda for Sustainable Development</i>	2015	•*	•	•	•	•	•	•	○**
Leipzig Charter on Sustainable European Cities	2007	•	○	•	•	○	•	○	
Kyoto Protocol to the United Nations Framework Convention on Climate Change	1997	•	•	•	•		○		
United Nations program of action from the 1992 Earth Summit in Rio de Janeiro. Agenda 21	1992	•	•	•	•	•	•	•	•
Report of the World Commission on Environment and Development <i>Our Common Future</i>	1987	•	•	•	•	•	•	•	○
Universal Declaration of Human Rights	1948					•	○	•	○

*Note: full dot (•) indicates resource type's objective participation in strategy in universal or/and specific meanings.

**Note: empty dot (○) indicates resource type's subjective participation in strategy. It is inevitable result or/and cause of objectives, usually not specified, but can be exemplified.

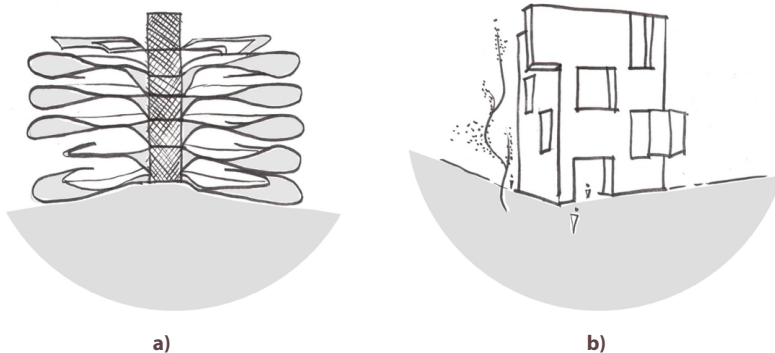


Figure 2. The cases of the resource blindness and chameleon principle 1.
 a. The sketch of the section of the BUTterFLY Residential Building (2023), Athens, Greece, designed by *architectScripta* (resource blindness) (source: created by author);
 b. The sketch of Anacleto Angelini UC Innovation Center (2014), Santiago, Chile, designed by *ELEMENTAL* (chameleon principle) (source: created by author)

of resource recycling and bioclimatic design, which affect energy consumption parameters (ArchDaily, 2008–2025a). Anacleto Angelini UC Innovation Center (hereinafter – Innovation Center) (2014), Santiago, Chile, is itself technical and social innovation in form and content. The inside-out concrete cube building with hollow grass core is subtle-looking energy-efficiency regulatory mechanism that manifests unique identity from the outside, strengthens sense of community in transparent interior spaces, and conveys physical and mental message of clarity and security, – explains *ArchDaily* (2008–2025b). Examples show architectural appearance that embodies either imitation or acquisition of natural features. To clarify, BUTterFLY resembles butterfly only in appearance, not in performance, revealing that it is ideological “cover” of its prosthetic structural filling (resource blindness) and Innovation Center due to its form and materiality is machine performing as living uniqueness (chameleon principle).

3.2. Regulations: architectural

The group specifically represents architecture as humanitarian outcome, including cultural heritage. They are derived from universal standards and therefore generally support already defined sustainable resource characteristics. Table 2 shows tendency of resource diversity inherent to architectural regulations. Comparison of the tools shows that attributes of heritage-consistent capital are the only ones that lack transformative states. Convention Concerning the Protection of the World Cultural and Natural Heritage (United Nations Educational, Scientific and Cultural Organisation, 1972) even considers capital changes, such as tourism development projects on heritage objects, to be dangerous. All other documents support resource mode change. This includes organizational patterns such as circularity, which is used to reuse, reduce, and recycle. Reorganization of social capital is characteristic of cultural policy; architectural development is not necessarily focused on improvement, except for broader set of skills and implements. For example, the Chicago Declaration of Interdependence for a Sustainable Future (Union internationale des architectes, 1993) prioritizes new capabilities in design that are not identified in any particular way, while Architects’ Council of Europe Declaration on Architecture and Sustainability (Architects’ Council of Europe, 2009) and the Republic of Lithuania Law on Architecture (hereinafter – Law on Architecture) (E-seimas.lrs.lt, 2017) give credit only to technical innovation. Full range of different resources listed in the documents form the basis for developing chameleon principle quality. However, following very general description of resources management, such as “compatibility with the principles of sustainable development” and requirement for “functional building structure” in the Law on Architecture (E-seimas.lrs.lt, 2017), can be applied to both chameleon principle and resource blindness.

To illustrate the tendency of diversity of resources interacting as chameleon principle or resource blindness, two cases are examined (see Figure 3). First, Warka Water Tower (2015), Dorze Village, Ethiopia, which has variety of alternatives (since 2013 starting from prototype V.1.7), is bamboo structure designed to harvest potable water from the air, – explains Marchese (2019). The solution is technology that serves human needs for physical survival, not manifestation of mental choices. Second, Abu Simbel (13th century BC) Great Temple, Abu Simbel, Egypt, is United Nations Educational, Scientific and Cultural Organization World Heritage Site. Inside Abu Simbel great temple, four seated sculptures – Ra-Horakhty,

Table 2. Evaluation of selected architectural regulations related to sustainability (source: created by author, based on UIA et al., 2022; E-seimas.lrs.lt, 2017; Architects' Council of Europe, 2009; World Commission on Culture and Development, 1995; Union internationale des architects, 1993; United Nations Educational, Scientific and Cultural Organisation, 1972)

Contemporary sustainability management strategies	Resources classification criteria								
	Nature	Environmental				Social			
	State	Matter		Energy		Physical	Mental		
	Type	Material	(Re)material	Power	(Re)power	Tangible	Innovations	Intangible	Inventions
Regulations: architectural	Year								
International Union of Architects Sustainable Development Goals Dhaka Declaration	2019	•*	•	•	•	•	•	•	
The Republic of Lithuania Law on Architecture	2017	•	•	•	•	•	•	•	
Architects' Council of Europe Declaration on Architecture and Sustainability	2009	•	•	•	•	•	•	•	
<i>Our Creative Diversity</i> : Report of the World Commission on Culture and Development	1995	•	•	•	•	•	•	•	•
Chicago Declaration of Interdependence for a Sustainable Future	1993	•	•	•	•	•	○**	•	○
Convention Concerning the Protection of the World Cultural and Natural Heritage	1972	•		•		•		•	

*Note: full dot (•) indicates resource type's objective participation in strategy in universal or/and specific meanings.

**Note: empty dot (○) indicates resource type's subjective participation in strategy – it is inevitable result or/and cause of objectives, usually not specified, but can be exemplified.

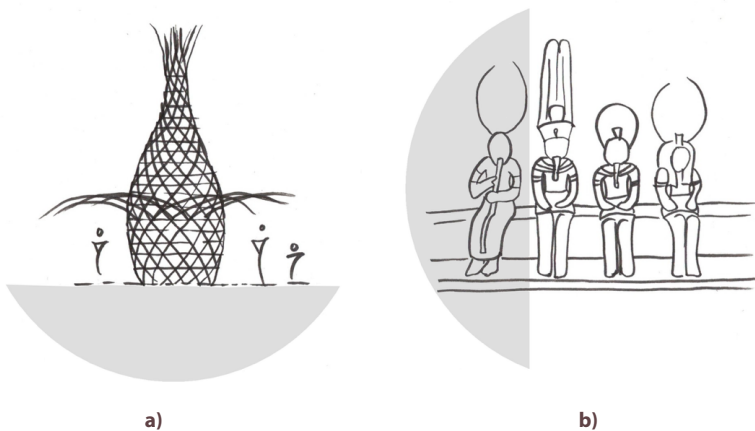


Figure 3. The cases of the resource blindness and chameleon principle 2.

a. The sketch of the Warka Water Tower (2015), Dorze Village, Ethiopia, designed by Arturo Vittori (resource blindness) (source: created by author);

b. The sketch of the Abu Simbel (13th century BC) Great Temple, Abu Simbel, Egypt, designed by unknown author(s) (chameleon principle) (source: created by author)

Rameses II, and gods Amun Ra and Ptah – are designed so that on 22 October and 22 February, entering sunlight illuminates all of them except figure of Phat, god of the underworld, thus symbolically revealing the true nature of representatives (Raddato, 2022). The artistic solution declares cultural heritage as architecture worthy of eternity, also adopted and reinterpreted by modern authors such as Richard Meier (Jodidio, 2012). Comparison between Warka Tower and Abu Simbel great temple shows difference between concepts of building and architecture. Thus, building involves environmental attributes and instinctive social capital yielding resource blindness. In contrast, solutions that operate continuously in alignment with physical time and space, and thus express intangible purpose that eventually or because of other circumstances changes, demonstrate chameleon principle.

3.3. Initiatives

The initiatives reviewed were selected to illustrate individual strategies formulated by practitioners or academics, specific areas requiring practitioners to collaborate to achieve normed or higher quality sustainable development. The list consists of six tools, declared in Table 3. Some, such as an Architecture Guide to the United Nations 17 Sustainable Development Goals (hereinafter – Architecture Guide) (Mossin, 2018), initiative and movement of NEB (European Union, 2025), are iterations of previous strategies, modified to adapt to specific contexts, such as architecture and contemporary challenges. The Environmental Resource Guide starting from 1992 (Demkin, 1999) and *The Upcycle: Beyond Sustainability – Designing for Abundance* (McDonough & Braungart, 2013) strategies are unique responses to *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind* (hereinafter – Report for the Club of Rome's Project) (Meadows et al., 1972) and generally form basis for other tools on the list. Environmental and social capital are interlinked in all tools. The tendency is observed that, starting from the early 20th century to the 1970s, strategies that focused on challenges of circular economy to develop surrogates (Britannica, 2025), later shifted to solving issues of resource processing, such as recycling (Oldenziel & Weber, 2013), or smart consumption, such as applying passive house techniques (Niskanen & Rohracher, 2022). According to the tendencies, temporal context is as important as novelty of strategy. Actuality of innovative capital, especially technological, is common to all initiatives, only Bauhaus focuses on changing social perception of issues. Peculiarities of strategies diversity are based on specific method of solution. In such a context, Report for the Club of Rome's Project (Meadows et al., 1972) illustrates scenarios to be avoided in area of food and industrial production, the only tool that does not consider solutions other than limiting existing development patterns. Others, such as the Environmental Resource Guide (Demkin, 1999), explains environmentally sensitive planning, alternatives for choice of materials; Iwamura (2019) gives summary of Architecture Guide, where indicates how certain types of environmental resources and applied techniques respond to certain human needs; Boris Bally's create chairs and plates from aluminum street signs to support the concept of upcycling (Zimring, 2016); the initiative and movement of NEB (European Union, 2025; Sadowski, 2021) is ongoing curriculum and practice to explore, develop, and transform traditional economy, for example, by creating construction blocks from reclaimed plastic waste, named *ByBlock*,

Table 3. Evaluation of selected initiatives related to sustainability (source: created by author, based on European Union, 2025; Mossin, 2018; McDonough & Braungart, 2013; Demkin, 1999; Meadows et al., 1972; Britannica, 2025; Mindrup, 2014)

Contemporary sustainability management strategies	Nature	Resources classification criteria							
		Environmental				Social			
	State	Matter		Energy		Physical		Mental	
	Type	Material	(Re)material	Power	(Re)power	Tangible	Innovations	Intangible	Inventions
Initiatives	Year								
Movement of New European Bauhaus	2019	●*	●	●	●	●	●	●	○**
An Architecture Guide to the United Nations Seventeen Sustainable Development Goals	2018	●	●	●	●	●	●	●	○
The Book <i>The Upcycle: Beyond Sustainability – Designing for Abundance</i>	2013	●	●	●	●	●	●	●	○
Environmental Resource Guide	1992	●	●	●	●	●	●	●	○
<i>The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind</i>	1972	●	○	●	○	●	●		
Movement of Bauhaus	1919	●	○	●	○	●	○	●	●

*Note: full dot (●) indicates resource type's objective participation in strategy in universal or/and specific meanings.

**Note: empty dot (○) indicates resource type's subjective participation in strategy – it is inevitable result or/and cause of objectives, usually not specified, but can be exemplified.

by *ByFusion* (Kavilanz, 2022). According to the research of initiatives and previous findings, chameleon principle is characteristic of all tools except Report for the Club of Rome's Project, which exclusively points out issue of consequences of standardized solutions, which are the main cause of resource blindness.

Characteristic principles of resources diversity in initiatives are studied in two cases, demonstrated in Figure 4. *Uchronia* (2006) installation by Arne Quinze meets idea of "art and self-expression" in which "sunbeams played with the wooden beams and resulted in a fascinating spectacle of light and shadow with consistently changing patterns", – denotes author in official online portfolio (Arnequinze.com, 2025). The artistic version of arbor, which was set on fire at the end of *Burning Man* event, is example of synergy between art and technology. *Dual Form with Chromium Rods* (1946) by Moholy-Nagy described as "vision in motion", "[...] new materials called for a new kind of art, and metal was appealing for its connection to industry and modern machinery" (Guggenheim, New York, 2025). Sculpture creates architectural interior aesthetics. Both cases involve sustainable materials, recyclable, natural, or surrogate, also follow exactly environmental and social capital linkage principle, which by default corresponds to chameleon principle. As it is emphasized that time context is important, in 21st century burning new production wood (first industrial chain) after single week of use is critical decision. To explain, the act related to *Uchronia* demonstrates negligence to circularity principle

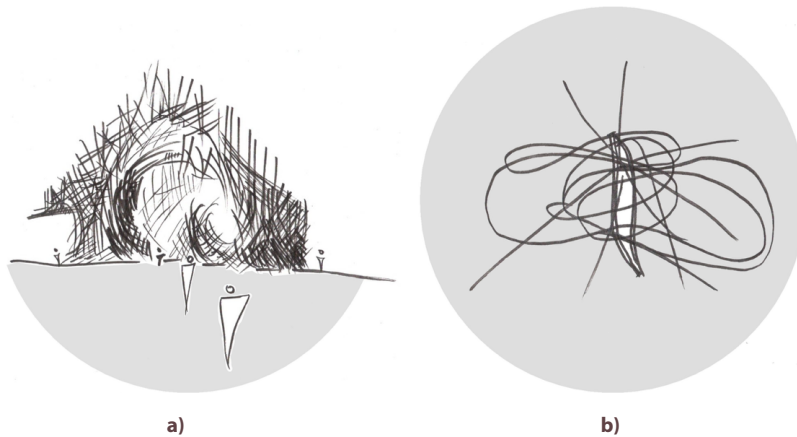


Figure 4. The cases of the resource blindness and chameleon principle 3.
 a. The sketch of *Uchronia* (2006) wooden installation, designed by Arne Quinze in Black Rock Desert, United States (US) (resource blindness) (source: created by author);
 b. The sketch of *Dual Form with Chromium Rods* (1946) plexiglas chrome-plated brass sculpture designed by László Moholy-Nagy at Solomon R. Guggenheim Museum, New York City, US (chameleon principle) (source: created by author)

for resource consumption, as described by *Cradle to Cradle* (McDonough & Braungart, 2013) initiative, thus is representative of resource blindness.

3.4. Competitions and collaboratives

The group includes analysis of six strategies declared in Table 4. *Green Building Challenge* is international collaborative effort to develop building environmental assessment tool that participating countries can modify and incorporate into their own tools (Larsson & Cole, 2001). All others – competitions – on the list are unique sets of requirements to create individual architectural solution. Each of the tools has its own set of mandatory criteria in terms of nature, state and type of capital, only requirements for environmental resources must be strictly adhered to (see Table 4). Specific characteristics of environmental capital vary. For example, *Green Building Challenge* defines it simply as “resources” (International Initiative for Sustainable Built Environment [IISBE], 2025; Larsson & Cole, 2001); Architecture Student Contest (2025) and the American Institute of Architects Committee on the Environment, in partnership with the Association of Collegiate Schools of Architecture, first annual competition for students (hereinafter – Top Ten for Students Competition) – “materials” (Association of Collegiate Schools of Architecture [ACSA], 2025); Green Design Competition – “water management” (Ethos Empowers, 2020); Sustainable Demonstration Building Competition (hereinafter – Building Competition) – “environmental product declaration declared materials” (VILNIUS TECH, Lietuvos žaliųjų pastatų taryba, 2021); Blue Clay Country SPA Competition – “blue clay” (Buildner 10+ Years, 2025). This tendency is inherent in all tools under all environmental resource categories, with the exception of Blue Clay Country SPA Competition, which has no direct objectives for inclusion of transformative states of capital. However, clay supports circular economy, its physical properties serve for regeneration of tangible capital, i.e., “blue clay for medical purposes”, are

also technologically favorable for accumulation of heat as well as represent intangible capital, such as traditional Baltic states building traditions (Janonienė, 2001). Tangible capital appears in double sense: it is either result of technical parameters or of creative abilities. For example, indoor environmental quality requirements, which relate to physical well-being of people, are result of building's technical performance as defined by *Green Building Challenge* (IISBE, 2025; Larsson & Cole, 2001), *Architecture Student Contest* (2025), and *Building Competition* (VILNIUS TECH, Lietuvos žaliųjų pastatų taryba, 2021) tools. The rest of the tools require creative experimentation with lighting or other aesthetic solutions, as well as incorporating responses to intangible cultural and community needs, that also affect people's physical sensations. Innovative capital is eligibility requirement, mainly in terms of technical building performance, inherent to *Building Competition* (VILNIUS TECH, Lietuvos žaliųjų pastatų taryba, 2021) and *Indian Green Building Council Green Design Competition* (Ethos Empowers, 2025), only the *Top Ten for Students Competition* (ACSA, 2025) also encourages innovative artistic solutions, thus allowing possibility to go beyond social standard solutions. In context of chameleon principle characteristics, competitions and collaborations provide motivation for multifunctional and diverse ways of using resources, for example, testing possibilities of using *Saint-Gobain's* products, blue clay, in variety of ways adapted to individual and cultural needs. If, on the other hand, the focus is on technical parameters, such as limits on energy consumption, pollutants, which is seen as the

Table 4. Evaluation of selected competitions and collaborations related to sustainability (source: Ethos Empowers, 2025; VILNIUS TECH, Lietuvos žaliųjų pastatų taryba, 2021; Buildner 10+ Years, 2025; ACSA, 2025; *Architecture Student Contest*, 2025; IISBE, 2025; Larsson & Cole, 2001)

Contemporary sustainability management strategies	Resources classification criteria								
	Nature	Environmental				Social			
	State	Matter		Energy		Physical		Mental	
	Type	Material	(Re)material	Power	(Re)power	Tangible	Innovations	Intangible	Inventions
Competitions and collaborations	Year								
Indian Green Building Council Green Design Competition 2023	2023	●*	●	●	●	●	●	●	
Sustainable Demonstration Building Competition	2021	●	●	●	●	○**	●	○	
Blue Clay Country SPA Competition	2017	●	○	●	○	●		○	
Top Ten for Students Competition	2015	●	●	●	●	●	●	●	○
Architecture Student Contest	2004	●	●	●	●	○		○	
Green Building Challenge	1998	●	●	●	●	○			

*Note: full dot (●) indicates resource type's objective participation in strategy in universal or/and specific meanings.

**Note: empty dot (○) indicates resource type's subjective participation in strategy – it is inevitable result or/and cause of objectives, usually not specified, but can be exemplified.

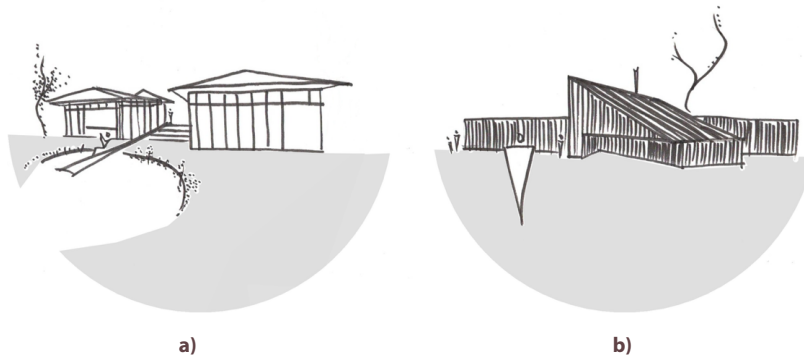


Figure 5. The cases of the resource blindness and chameleon principle 4.
 a. The sketch of the Blue Clay Country SPA Competition (2017) of the team of Lithuania (resource blindness) (source: created by author);
 b. The sketch of the Blue Clay Country SPA Competition (2017) of the team of Portugal (chameleon principle) (source: created by author)

ultimate goal, this leads to application of standard solutions, which are alternative meaning of resource blindness.

Blue Clay Country SPA competition is chosen to demonstrate theme of focus on limitless-ness *versus* limited possibilities related to standardization (resource blindness) and creative destruction of norms (chameleon principle). Two approaches will be examined, shown in Figure 5. First place winning concept solution was proposed by team from Portugal – João Varela, Ana Isabel Santos, João Tavares, and Paulo Dias. Team from Lithuania – Dalia Augustinaitė (the author of this article), Gabrielė Seneckytė, and Mantas Žvybas – completed the proposal but did not submit it (Augustinaite.lt, 2025). Comparison of cases is based on interpretation of requirements for use of clay material. Lithuanian team develops idea of blue clay as material for building human and house carcasses. Focus only on technical parameters dictated standard performance and appearance of solutions, which together is quality combination of separate interchangeable parts in terms of both form and materiality. Portuguese team explains that blue clay is sustainable health treatment tool and metaphor for building human resilience. Therefore, for technological construction of campus it is too precious to use. Instead, wood will be used, which, according to the authors, can be easily transformed if necessary, as well as reused (Buildner 10+ Years, 2025). According to examples, standard interpretation and use of environmental resources refers to blindness to other possibilities (resource blindness) and thus supports consumerism, concept of finiteness. Chameleon principle, on contrary, allows for other possibilities of using resource technically or ideologically, or even using alternatives to support philosophy, concept of infinity.

3.5. Assessment systems for sustainable building

The study examines six of these standards, listed in Table 5. All of the standards are commercial third-party certifications that use total point system to calculate level of sustainability. All of them, with the exception of *Living Building Challenge* (International Living Future Institute, 2019), which involves technical parameters beyond zero (net positive feature), come close

Table 5. Evaluation of selected sustainable building assessment systems related to sustainability (source: created by author, based on Deutsche Gesellschaft für Nachhaltiges Bauen, 2023; BREEAM, 2021; U.S. Green Building Council, 2020; International Living Future Institute, 2019; Lietuvos žaliųjų pastatų taryba, 2019; Japan Sustainable Building Consortium, Institute for Building Environment and Energy Conservation, 2014)

Contemporary sustainability management strategies	Nature	Resources classification criteria							
		Environmental				Social			
	State	Matter		Energy		Physical		Mental	
	Type	Material	(Re)material	Power	(Re)power	Tangible	Innovations	Intangible	Inventions
Sustainable building assessment systems	Year								
German Sustainable Building Council	2023	○**	○	●*	○	○	●		
Building Research Establishment Environmental Assessment Method	2021	●	●	●	●	○	●		
Leadership in Energy and Environmental Design	2020	●	●	●	●	○	●		
<i>Living Building Challenge</i>	2019	●	●	○	●	●	○	●	
Lithuanian Building Sustainability Assessment System	2018	●	●	●	●	○			
Comprehensive Assessment System for Built Environment Efficiency	2014	●	●	●	●	○			

*Note: full dot (●) indicates resource type's objective participation in strategy in universal or/and specific meanings.

**Note: empty dot (○) indicates resource type's subjective participation in strategy – it is inevitable result or/and cause of objectives, usually not specified, but can be exemplified.

to truly sustainable solutions in the maximum score (based on features such as criteria of limits approaching zero and net zero). *Living Building Challenge* (International Living Future Institute, 2019) also includes criteria of tangible and intangible social capital related to beauty features, i.e. evaluates whether solution is architecture or shows uniqueness of design – is innovation. Other systems, due to environmental criteria (acoustics, thermal comfort, natural light, and ventilation), have direct impact on tangible social capital represented as environmental quality characteristics or, more specifically, health and well-being in Lithuanian Building Sustainability Assessment System (LBSAS) (Lietuvos žaliųjų pastatų taryba, 2019). Leadership in Energy and Environmental Design (U.S. Green Building Council, 2020), Building Research Establishment Environmental Assessment Method (BREEAM, 2021), and German Sustainable Building Council (GSBC) (Deutsche Gesellschaft für Nachhaltiges Bauen, 2023) are characterized by assessing higher social capital at the level of innovation as applied technological tools. All the standards evaluate all types of environmental criteria. However, some tools are more precise in certain areas, e.g., Comprehensive Assessment System for Built Environment Efficiency (Japan Sustainable Building Consortium, Institute for Building Environment and Energy Conservation, 2014) specifies requirements for subtypes of materials, such as timber. Others, such as *Living Building Challenge* (International Living Future

Institute, 2019) and GSBC (Deutsche Gesellschaft für Nachhaltiges Bauen, 2023), instead of giving details of requirements for environmental resources, promote universal principles, e.g., economic quality. Brennan (2011), by examining building cases that were evaluated using alternative of LBSAS, specifically the code for sustainable homes, came to understanding that higher ambitions of architect and investments in architectural design pay off in the end results compared to starkly functional solutions. The statement highlights issues of cost-effectiveness associated with chameleon principle and low-cost (inherent to affordability and utility) solutions with resource blindness.

Two cases are used to discuss the issue of resource interaction costs on sustainable development: *Business Stadium West Office Building*, Vilnius, Lithuania, certified LBSAS, and *Meggie's Leeds Centre*, Leeds, England, United Kingdom, certified *Living Building Challenge* (see Figure 6). Maneuvered *Business Stadium West* building form and clear glass “cutouts” create integrity of scale and context and mark access points (ArchDaily, 2008–2025d). LBSAS certification was based on analysis of impact of *Business Stadium West* structural framework on technical performance of the building. However, the strategy did not include evaluation of building's unique shape in terms of form efficiency (Belniak et al., 2013), which directly affects cost of construction and exploitation over project's life cycle. *Meggie's Leeds Centre* forms three standard large-scale green planters. In 2021, *ArchDaily* (2008–2025c) stated that “the building's structure is built from a prefabricated and sustainably-sourced spruce timber system”, which is smart inter-typical solution, creating effective form and function of biophilic design. The solution is prototype, cost of which is high due to resources required to develop it, but ultimately decreases due to compatibility with universal design principles characteristic of chameleon principle. On the contrary, the shape of *Business Stadium West* building, which disregards natural principles, is example of reckless design with low development costs and rising costs in the long run, which is typical of resource blindness.

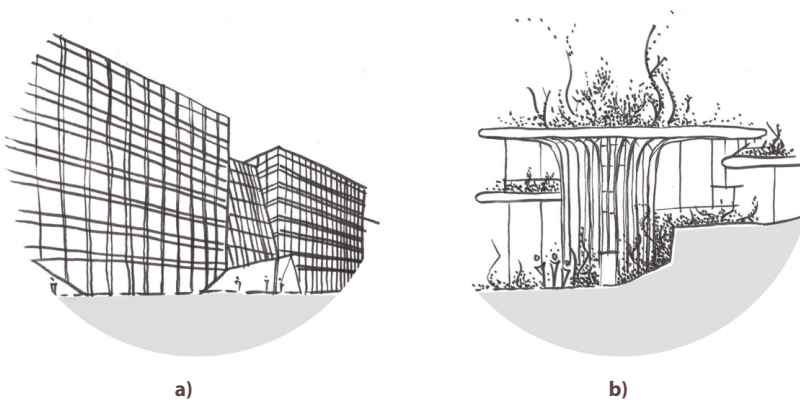


Figure 6. The cases of the resource blindness and chameleon principle 5.

- a. The sketch of *Business Stadium West* (2019), Vilnius, Lithuania, designed by *Arches* (resource blindness) (source: created by author);
- b. The sketch of *Meggie's Leeds Centre* (2020), Leeds, England, United Kingdom, designed by *Heatherwick Studio* (chameleon principle) (source: created by author)

According to results emerging in examined strategies on chameleon principle and resource blindness, even inclusion of full spectrum of resources does not guarantee sustainable result, regardless of whether level of sustainability is considered or not. As consequence, unless way is found to interact with chameleon principle, none of combinations of existing methodologies can prevent or correct error of resource blindness.

4. Conclusions

Examined characteristics of resources defined in strategies related to sustainability, show that quantity of natures, states, and types of involved capital, as well as type of existing in practice (in use) methodology does not necessarily determine features of sustainability even by match of separately sustainable sources, only specific principles of capital synergy do. The author of the publication suggests to name such problem as peculiarities of resource blindness phenomenon and solution as chameleon principle. Peculiarities connected with chameleon principle are: 1) interaction between environmental and social natures of capital; 2) only synergy between physical and mental states of interacting different natures of resources results in architectural solution; 3) unique, innovative solution or ability of appearance in other materiality (invention) results in architectural solution; 4) context of space as well as time matters; 5) natural and/or universal performance of form-materiality result effective cost related to solution longevity. Neglecting of the laws results in resource blindness phenomenon, *i.e.*, building features, despite covering it in ideology. The results form the basis for modeling framework of practical tool for creation and evaluation of sustainable development, possibly in levels, based on various peculiarities of resource interaction, and is the task for further research.

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