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HEALTH AND WELLBEING RE-VISITED; AN EXPLORATORY STUDY TOWARDS A "HEALTHY & WELLBEING" UNIVERSITY CAMPUS

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Abstract

“Health and wellbeing”, buzzword of the era! Whether the term is revolutionizing the way people think about buildings or not is still under investigation. Nevertheless, it certainly explores how design, operations and behaviors within the places where we live, work, learn and play can be optimized to advance human health and wellbeing. Knowing that the term has the possibility of being applied to different scales and arenas, this research focuses on the scale of university campuses. Numerous studies have revealed that university campuses could play a substantial role in boosting the innovation within communities and reinforcing the mission of developing human resources aligned with fostering competitive technological advantages. In cities, societies tend to maximize their competitive benefits to attract more talents and investment. Thus, reconstructing the relationship between campus and the city is becoming more substantial for the survival and flourishes of these communities. This research is an exploratory study building on the epistemological promises of the term; “health and wellbeing” on a communal level; the level of university campuses. The objective is to conceptualize a model that would help us study, create and or evaluate university campuses. The argument follows an inductive qualitative approach building on available knowledge in the field of urban and environmental planning and reaching to applications in the field of health and wellbeing certification. A systems approach ties the elements together with a final exploratory model on its applicability. This would certainly help designers, policymakers and others to evaluate, enhance and create university campuses that would raise the banner or health and wellbeing.

Keywords

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ABSTRACT

"Health and wellbeing", buzzword of the era! Whether the term is revolutionizing the way people think about buildings or not is still under investigation. Nevertheless, it certainly explores how design, operations and behaviors within the places where we live, work, learn and play can be optimized to advance human health and wellbeing.

Knowing that the term has the possibility of being applied to different scales and arenas, this research focuses on the scale of university campuses. Numerous studies have revealed that university campuses could play a substantial role in boosting the innovation within communities and reinforcing the mission of developing human resources aligned with fostering competitive technological advantages. In cities, societies tend to maximize their competitive benefits to attract more talents and investment. Thus, reconstructing the relationship between campus and the city is becoming more substantial for the survival and flourishes of these communities.

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KEYWORDS

Health and wellbeing, Sustainable campus, Systems theory, Wellness Concept.

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1. INTRODUCTION

> "…. a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community".
>
> (WHO, 2001).

"Health is a state of body; wellness is a state of being".

(J. Stanford, 2014)

"Health and wellbeing", buzzword of the era! Once in a while, intellectual life gets bombarded by a term or a concept that stirs scholars' thoughts and actions. The 1980's and onwards have witnessed the rise of sustainable development and sustainability as a binding theme and concept for growth and development. However, lately research and policy arenas are witnessing the rise of a more appealing term; health and wellbeing".

Historically, one would definitely say that "Health and Wellbeing" is never a new concept in the arena of human intellect and practice. Ancient cultures have always contemplated the term in their own ways; certainly our ancestors have dealt with the issue in an eloquent manner that never lacked integrity or coherence. For example, one would be surprised by the Japanese approach to the issue. Fig (1) illustrates a mandala for a wholistic approach to wellbeing of an individual. What about Islamic culture and the Quranic teachings that touch on the very same issue? Lots of verses in Quran assert the same meanings of wholeness and its relation to wellbeing.

One would certainly say that "Health and Wellbeing" is revolutionizing the way people think about buildings, communities and existence. It explores how design, operations and behaviors within the places where we live, work, learn and play can be optimized to advance human health and wellbeing. The concept of wellbeing encompasses the physical mental and emotional, social, and spiritual dimensions of health. Actually, a closer look at the history of intellect, especially in the field of urban and environmental planning, one finds glimpses of the term in the writings and practices of pioneers such as Guiden, Freedman, Jacobs, etc. Although it wasn't clearly defined as "health and wellbeing," the idea itself was the main trigger of their contributions.

Since the late 1970, "being well" concepts, such as those in the field of workplace wellness, have surfaced and grown in the research and policy-making arenas, thus affecting our lives. Today, stand-up desks, walking meetings, and step challenges are the norm, and companies devote entire campuses and company policies to foster wellbeing. Such measures, which look beyond return on investment to total value added, have proven to help increase candidate pool competitiveness and retain workers.

Consequently, the World Health Organization (WHO) officially came to define health as "a state of complete physical, mental, and social wellbeing—not merely the absence of disease, or infirmity." The enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being regardless of race, religion political belief, and economic or social conditions.

Fig. 1 Japanese interpretation to wellbeing. (NAKANISHI, 1999)

The objective of the World Health Organization shall be the attainment by all peoples of the highest possible level of health" (Treaties, 1984). Fig (2) illustrates the pillars of health and wellbeing encompassed by WHO.

Generally speaking, one would say that most research and policies to date have focused on relationships between the built environment and humans' physical health rather than mental health and wellbeing (Egan et al., 2003; Bunn et al., 2003; Burns et al; 2014 Cerda et al., 2013; NICE, 2008; Tully Mark et al., 2013; World Health Organization, 2006). Systematic review of intervention studies examining effects of changes to the built environment on the health of children and young people found some evidence of potential benefits to physical activity but was unable to find any mental health and wellbeing outcomes in the literature (Audrey and Batista-Ferrer, 2015; (T.H.M. Moorea, 2018).

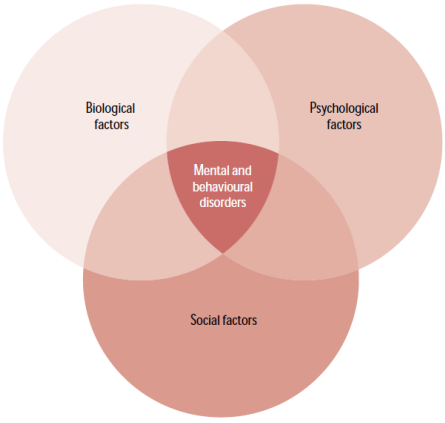

Fig. 2 Interaction of biological, psychological and social factors in the development of mental disorders. (WHO, 2001)

2. OBJECTIVES AND METHODOLOGY:

> "This is the single biggest challenge for higher education. Our goal should be nothing less than to train a new generation of sustainability leaders, graduates who understand the intricate connections between economics and ecology, place and planet, between how we live and the consequences of our actions". (THOMASHOW, 2010)

Knowing that the term "Health and Wellbeing" has the possibility of being applied to different scales and arenas, this research focuses on the scale of university campuses. Numerous studies have revealed that university campuses could play a substantial role in boosting the innovation within communities and reinforcing the mission of developing human resources aligned with fostering competitive technological advantages. In cities, societies tend to maximize their competitive benefits to attract more talents and investment. Thus, reconstructing the relationship between the campus and the city is becoming more substantial for the survival and flourishes of these communities.

This research is an exploratory journey building on the epistemological promises of the term; "health and wellbeing" on a communal level; the level of university campuses. The objective is to conceptualize a model that would help us study, create and or evaluate university campuses. The argument follows an inductive qualitative approach building on available knowledge in the field of urban and environmental planning and reaching to applications in the field of health and wellbeing certification. A systems approach ties the elements together with a hope for exploring a model for a healthy and wellbeing campus "WELL".

3. "HEALTH AND WELLBEING" AND SUSTAINABILITY AT CROSSROADS:

Since the late seventies of the last century, the scientific and policy arenas have had to deal with different paradigms of growth and development, of which sustainability and wellbeing have been the most appealing ones. Although "sustainability" took over the scene till the beginnings of the 21st century, "health and wellbeing" is certainly on the rise as an evolutionary concept or paradigm for action.

As for sustainability, the WECD report in 1987 have offered an explanation to the term, no consensus on a single definition has been reached ever. Economic development, inter-generational relations, ecosystem health, and social equity are basic tiers for this approach (Bruntland, 1987). What should concern us, is their possible effect on future urban forms.

Depending on interpretations and scholars' orientations, sustainability could mean and advocate for a wide array of goals. These range from green production, recycling and preserving nature, to extreme behavioral changes, such as alternative lifestyles and consumption patterns, putting caps on growth and other practices that deplete natural resources (Daly, 1994). Diffusing these concepts within our system would only reap its benefits and induce required changes in the end. On the other side, if these new values have been forced only on some aspects of life, conflict arises and other undesired scenarios are guaranteed.

With the proliferation of measures and policy initiatives targeting sustainable futures, one would find some solid actions in the field of sustainability and certification. This has been a step towards quantifying successes and failures on the road to a better future. The following section defines some of these interventions that could guide us throughout the process of developing a model for understanding a hypothetical "Health and Wellbeing" university campus.

3.1. Building Rating Systems:

The global awareness of the significant environmental impact of buildings has been driving research efforts towards developing innovative standards and systems that promote sustainability in construction projects. Currently, 382 registered software tools are available for assessing the energy efficiency, renewable energy, and energy performance of buildings (B.K. Nguyen 2011). The first commercially available system was the Building Research Establishment Environmental Assessment Method (BREEAM), which was proposed by the Building Research Establishment (BRE) in the United Kingdom (UK) in 1990 (Ding, 2008). Since then, other similar assessment systems have been developed by governments and third parties with the objective of addressing the quality of building design, construction and operation, and the impact of buildings on the surrounding community and on the environment (X. Chen 2015). These existing green building rating systems vary greatly from one another, differing in terms of the phase of a building's life cycle to which they are applied, building type (e.g., commercial versus residential), and approach (globally- versus locally-based). Nevertheless, all of these rating systems account for a building's energy consumption, impacts on human health and on the surrounding communities, and a building's environmental sustainability (J. Zuo 2014), as their primary objective is to provide a comprehensive assessment of the environmental performance of buildings (Cole, 1999 & Aladdin Alwisy, 2018)

Nguyen and Altan, in a study on green building rating tools, conclude that BREEAM and LEED are the two leading rating tools. They also indicate that CASBEE and Green Star may become increasingly influential in the future.

Table 1: Main feature of BREEAM, LEED and Green Star NZ.(Dat Tien Doan & Amirhosein Ghaffarianhoseini, 2017)

	BREEAM	**LEED**	**CASBEE**	**Green Star NZ**
Country	UK	US	Japan	NZ
Organizations	BRE	USGBC	JSBC	NZGBC
Flexibility	77 countries	160 countries	1 country	1 country
First version	1990	1998	2002	2007
Latest version	2016	2013	2015	2016
Main categories	Management Health & Wellbeing Energy Transport Water Material Waste Land Use & Ecology Pollution Innovation	Integrative process Indoor Environment Quality Energy & Atmosphere Location & Transportation Water Efficiency Material & Resources Sustainable Sites Regional Priority Innovation	Indoor Environment Quality of Service On-site Environment Energy Resources & Materials Off-site Environment	Management Indoor Environment Quality Energy Transport Water Material Land Use & Ecology Emissions Innovation
Rating approach	Pre-weighted categories	Additive credits	BEE ranking chart	Pre-weighted categories except for Innovation
Rating Level	Pass ≥30 Good ≥45 Very good ≥55 Excellent ≥70 Outstanding ≥85	Certified ≥40 Silver ≥50 Gold ≥60 Platinum ≥80	Poor: BEE <0.5 Fairy Poor: BEE = 0.5-1.0 Good: BEE = 1-1.5 Very good: BEE = 1.5-3; or BEE ≥ ٣and Q < 50 Excellent: BEE ≥3 and Q ≤ 50	Best practice ≥45 Excellent ≥60 Leadership ≥75
Number of certified buildings	561.1600	79.100	541	125

A closer look at the main features of these four leading rating systems (BREEAM, LEED CASBEE, Green Star NZ), as shown in table (1), shows that all of the rating systems are making efforts to revise and update their criteria more frequently to follow immediately with the rapid development of sustainable construction. (Dat Tien Doan & Amirhosein Ghaffarianhoseini, 2017). Table (2) reveals that the primary focus of green building and sustainable environment is on building energy efficiency which has the highest weighted score in each of the rating tools, except BREEAM and 'Green Star' South Africa (SA) which have the highest weighted scores in transportation and IEQ respectively. The Green Building Index

(Malaysia, 2011)rating tool system in Malaysia has the highest weighted score for energy efficiency as shown in Table 2 while LEED has the highest score for IEQ followed by the GBI rating tool. On the detailed assessment of the GBI rating tool, IEQ criteria have a total weighted score of 21 points being the highest, after energy efficiency.(Nimlyat, 2018)

Table 2: Comparison of some Green Building Rating Tools System.(Nimlyat, 2018)

Assessment Criteria	LEED	Green Mark	GBI	Green Star (SA)	BREEAM
Energy Efficiency and Atmosphere	25	30	38	18	17
Indoor Environmental Quality	22	15	21	20	NA
Environmental Protection/ Pollution	NA	NA	NA	10	13
Project Development and Ecology	NA	NA	NA	NA	11
Water Efficiency	7	20	12	10	4
Material and Resources	19	NA	9	15	9
Transportation	NA	NA	NA	8	20
Sustainable Site Planning	20	10	10	6	NA
Innovation and Design	7	15	10	4	NA
Other green features and management	NA	10	NA	9	13
Health and Wellbeing	NA	NA	NA	NA	13
Total Points	100	100	100	100	100

3.2. Sustainable University Campuses

According to Mitchell Thomashow (2010) in his Article titled ‘ Nine Elements of a Sustainable Campus,’ sustainability as a way of life has a long tradition in U.S. higher education, whether it’s Henry David Thoreau’s musings and experiments, Helen and Scott Nearing’s homesteading, Lewis Mumford’s vision of ecological cities and technology, or the countless attempts to link character, community, and ecological living. It is crucial to understand that sustainability is a response to a planetary emergency. Universities today bear the same responsibility to confront environmental challenges as other institutions, municipalities, and countries around the world. They can make unique contributions through research, teaching, student initiatives and community involvement. Universities also have many opportunities to practice sustainability, through such activities as campus operations and the housing, feeding, transportation. All these could contribute to curbing greenhouse gas emissions that tops the world’s list of environmental priorities.

Based on these calls, nine elements of a sustainable campus, designed to evoke a twenty first century catalog of transformational sustainable practices were proposed. These entail three broad categories—infrastructure (energy, materials, and food), community (governance, investment, and wellness), and learning (curriculum, interpretation, and aesthetics). Imagine these categories as dynamic, emergent, and intrinsically interconnected. Any sustainable endeavor may involve multiple categories. For example, ecologically efficient LEED Platinum–certified building may reduce the carbon footprint of a campus, but if it doesn’t also serve an inspirational curricular or interpretive function, it may not achieve its full educational potential. These nine elements aren’t a checklist, nor are they criteria for measuring success. They are meant to evoke the necessity of envisioning and applying sustainable practices to all aspects of campus life. (Fig.3)

Fig. 3: Nine Elements of a Sustainable Campus. (THOMASHOW, 2010)

4. "WELL" BUILDING STANDARD:

As a Logical response to the calls for health and wellbeing strategies, one would highlight the creation of the "WELL" standard. Briefly:

- This is the first standard of its kind that focuses solely on the health and wellness of building occupants.
- WELL identifies 100 performance metrics, design strategies, and policies that can be implemented by the owners, designers, engineers, contractors, users and operators of a building.
- WELL is based on a thorough review of the existing research on the effects of spaces on individuals and has been advanced through a thorough scientific and technical review.
- In order to achieve the requirements of the WELL Building Standard, the space must undergo a process that includes an on-site assessment and performance testing by a third party.(LLC, 2017)

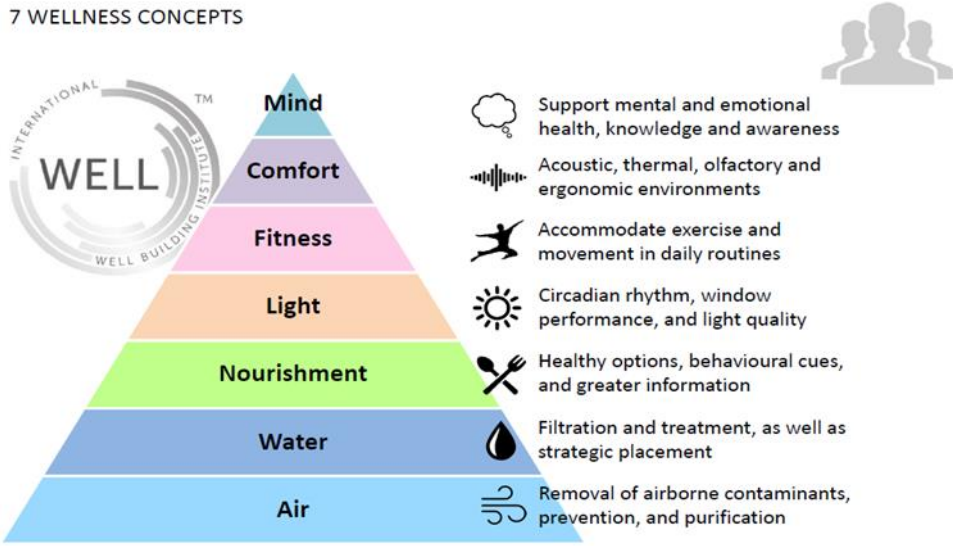

Fig. 4: Seven Wellness Concept. Reference: (LLC, 2017)

The seven Concepts are comprised of 102 features. Every feature is intended to address specific aspects of occupant health, comfort or knowledge. Each feature is divided into parts, which are often tailored to a

specific building type. This means that depending on the building type (e.g., New and Existing Interiors or Core and Shell), only certain parts of a given feature may be applicable. Within each part are one or more requirements, which dictate specific parameters or metrics to be met (Fig. 4). In order for a project to receive credit for a particular feature, all of its applicable component parts specifications must be satisfied.(LLC, 2017)

Features can be:

- Performance-based standards that allow flexibility in how a project meets acceptable quantified thresholds
- Prescriptive standards that require specific technologies, design strategies or protocols to be implemented.(LLC, 2017)

4.1. Then What? A Model for A "Healthy & Wellbeing" University Campus

According to Webster's dictionary, "a theory is a plausible or scientifically acceptable general principal or body of principles offered to explain certain phenomena, or the analysis of a set of facts in their relation to one another." As a take off, one should ask: what is the validity of building a "theory or model for health and wellbeing"? What level of abstraction is required or tolerated within such a theory? Moreover, what should be expected from it? The researchers believe that such a theory should describe and analyze both past and present behavior of a certain well-defined set of elements, related to each other in some way or another; in our case it's the tergetted university campus and the elements of wellbeing. Ultimately, a theory should prove its consistency by estimating and determining behavior at a certain point in the future. When it comes to health and wellbeing, no one could adhere to a single definition. Again, according to Webster's dictionary, it means "the state of being happy, healthy, or successful", this sounds easy to define though controversial or impossible to operationalize.

Setting the main guidelines for defining a theory and its functions leads us to the preferred level of abstraction. After joggling with different elements of the health and wellbeing definitions, measures and expected interactions, the researchers realized that rolling in all themes and subthemes as followed in previous pratcices (WELL , LEED, etc.), their possible impacts on different aspects of health and wellbeing, and the interactions between these and other elements would end up in a maze, for which no escape is guaranteed. Alternatively, a much more abstract, qualitative, yet convenient way for diagramming these interrelationships has been conceptualized.

As for measuring variables, we know that numbers usually fascinate people. For most, defining a term or an idea and putting numbers and percentages next to it means accuracy and uncontested knowledge. As the case with any other concepts in all fields of knowledge, scholars just love to assign numbers to variables. Although this could help us understand differences between different entities being evaluated, it could be totally or partially biased. The model to be presented and/ or discussed is of a qualitative nature. Although one could assign numbers to some of its components, we should be alert that these numbers are literally for guidance throughout the process not to build on further conclusions.

Fig (5) borrows from a previously proposed "force and filter" model (Azab, 2000), where each factor could be conceptualized as a force exerting some sort of pressure, and simultaneously acting as a filter or mediator for any other possible impacts from other sources. These filters have different filtering capacities and cyclical characteristics depending on the context of study and possible friction points between these filters. Each filter should be seen as a web of interactions between infinite subsystems. These filters have a synergistic effect on the filtered actions, i.e. their total effect is larger than the sum of their single impacts. Consequently, the resulting Status of a university campus exerts its own pressure and puts some constraints on these forces and filters.

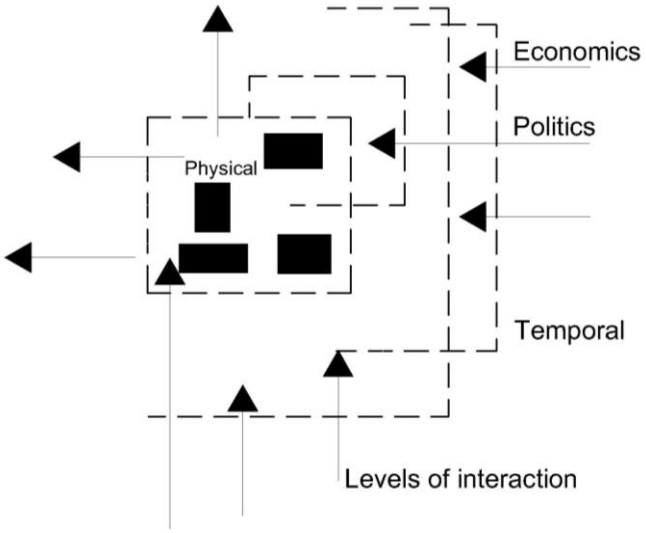

Fig. 5: Force and filter conceptualization for a WELL university campus (Author)

5. ELEMENTS OF THE PROPOSED MODEL:

5.1. Contextual Situation:

When applying our proposed model, one needs to contextualize for the university under investigation; its history, mission and vision. This is critical in identifying the boundaries, aspirations and criteria for the wellbeing on both individual and aggregate levels. However, no generalizations whatsoever are possible when dealing with different contexts.

At the level of physical dimensions of the case under investigation, one could utilize any of the available standard measures of sustainability and or wellness. Contextual situation is critical… Context: with all its dimensions (sociocultural, environmental, technological, economic, historical, etc.).

5.2. Conceptual/ Metaphysical level:

- Scale, Levels of interaction and assessment.
- The contextual dimension of evaluation and creating rubrics/ standards for assessment.

5.3. Outer Community:

Again, different levels and definitions for a community apply.

5.4. Boundaries: Tangible vs. Intangible Sides of A Campus:

Components (physical, virtual campuses. In the age of virtual reality, artificial intelligence, etc., attention should be paid to intangible aspects of a university campus. Outreach activities/ aspects are as important as immediate ones that take place on daily bases. A campus: has two dimensions; tangible and intangible. Physical boundaries and others (intellectual unlimited ones).

5.*5. Players and Stakeholders:*

Immediate ones (workers, students, etc.) The individual vs the group… better call it the individual within the group.

5.6. Communication:

Within and outside. Interactions: between humans, entities, each other, intra and intro, Interactions, synergetic effect on each other, affect and get affected, (force and filter works just fine).

5.7. The Environment:

- Energy and Vibes!
- Innovation,
- Integrity
- Economics
- Technology/ innovation
- Educational, learning
- Sociocultural
- Political

5.8. Social Capital and Contribution to Wellbeing Of A Community:

It broadly refers to those factors of effectively functioning social groups that include such things as interpersonal relationships, a shared sense of identity, a shared understanding, shared norms, values, trust and cooperation (Putnam, 1990).

5.9. Governance and/ or channels of Participation:

Therefore, Governance is an issue in our definition for a healthy campus. In a recent review article, (McCann,2016) notes that contemporary urban governance analyses consider how policy, power, and politics shape the relationships between built environments and the identities, practices, struggles and opportunities of everyday social life in the city. He underlines the critical role of state and non-state actors, and informal localized practices.

A team that has expertise in the aforementioned arenas should carry the task of evaluating the wellness of a given university campus. No one could claim expertise in all these factors that count towards the aggregate wellness of a campus. However, a coordinator is preferable to orchestrate the task and envision ways of communication among different players and at different le vels of assessment.

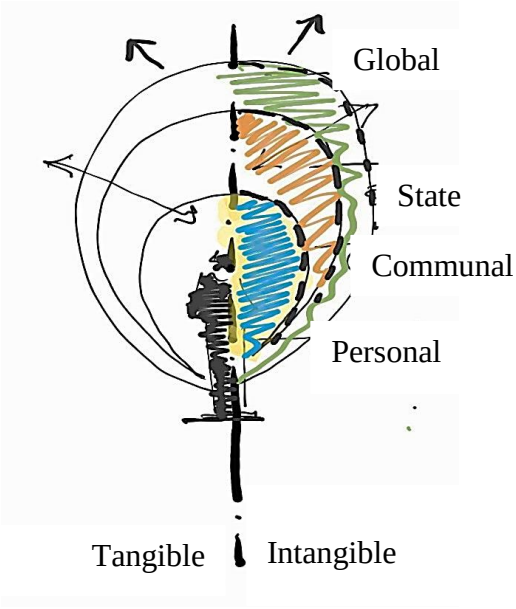

Fig. 6 : Contextual scales and effects on wellbeing. (Author)

6. HEALTH AND WELLBEING IN RETROSPECT:

One should also highlight that there is no consensus on one definition for the term "health and wellbeing." It is one of those loose, bumpy terms that will always stir discussions and excitement in all arenas.

In contrary to health issues, wellbeing is more of an intangible concept, related to the sociocultural intangible side of the coin. (Integrity, individualism, social cohesion, etc. All of these are contextually sensitive when defining wellbeing of an individual and/ or community. This model is contextually sensitive. Operationalizing the term wellbeing Building a model is more of an exploratory approach that certainly needs continuous contributions and refinements from scholars in all arenas of human thought.

N.B: Creating WELL standard- from the perspective of the researchers- is discounting the wholeness of the term "wellbeing"

Comfortable, Delight, Satisfaction, excitement = wellbeing Ikigai
Knowing that we dealing with an entity – university campus- which is more than the sum of its individuals wellbeing

REFERENCES

- Aladdin Alwisy, S. B., Mustafa Gül. (2018). *Criteria-based ranking of green building design factors according to leading rating systems*. Energy & Buildings .
- Azab, N. (2000). Toward A Theory of Urban Form: *Economic Factors and Urbanization. Role of Engineering Towards Better Environment '2000'*. Proceedings of the International Conference, by University of Alexandria, Faculty of Engineering.
- B.K. Nguyen , H. A. (2011). Comparative review of five sustainable rating systems. Procedia Eng.- .386-37. 6-21
- Bruntland. (1987). Report of the World Commission on Environment and Development: Our Common Future .
- Cole, R. J. (1999). Building environmental assessment methods: clarifying intentions. Build. Res. Inf. 27 230–246 .
- Daly, H. a. J. B. C .J. (1994). For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future. Boston: Beacon Press .
- Dat Tien Doan, A. G., Nicola Naismith, Tongrui Zhang,, & Amirhosein Ghaffarianhoseini, J. T. (2017). A critical comparison of green building rating systems. Building and Environ*ment* .
- Ding, G. K. (2008). *Sustainable construction—the role of environmental assessment tools. J. Environ. Manage. 86 451–464* .
- J. Zuo , Z. Z. (2014). *Green building research–current status and future agenda: a review.* Renewable Sustainable Energy Rev. 30 271–281 .
- LLC, D. L. (2017). *The WEEl Building Standard* .
- Malaysia, G. B. I. (2011). *GBI Assessment Criteria for Non-residential Existing Building.* first ed., (NREB)
- NAKANISHI, N. (1999). *Ikigai' in older Japanese people*. British Geriatrics Society .

- Nimlyat, P. S. (2018). *Indoor environmental quality performance and occupants' satisfaction [IEQPOS] as assessment criteria for green healthcare building rating.* Building and Environment .
- T.H.M. Moorea, b., , J.M. Kestena,c, J.A. López-Lópezb, S. Ijaza,b, A. McAleenanb, A. Richardsa, S. Grayd, J. Savovića,b, S. Audreyb. (2018). *The effects of changes to the built environment on the mental health and well-being of adults: Systematic review .Health & Place .*
- Thomashow, M. (2010). *Nine Elements of a Sustainable Campus. The Journal Of The American Institute Of Architects .*
- Treaties. (1984). *World Health Organization .*
- WHO. (2001). *World Healt Report 2001*
- X. Chen , H. Y., L. Lu. (2015). *A comprehensive review on passive design approaches in green building rating tools.* Renewable Sustainable Energy Rev. 50 1425–1436 .