SDG2030: A SUSTAINABLE BUILT ENVIRONMENT'S ROLE IN ACHIEVING THE POST-2015 UNITED NATIONS SUSTAINABLE DEVELOPMENT GOALS

Alex Opoku[1]

Bartlett School of Construction and Project Management, University College London, Faculty of the Built Environment, 2nd Floor 1-19 Torrington Place, London, WC1E 7HB, UK

In September 2015, the 193 UN member states adopted the new Sustainable Development Goals (SDGs) consisting of 17 goals, supported by 169 targets and underpinned by 100 global indicators. Delivering a Sustainable Built Environment (SBE) is vital in achieving the SDGs due to the impact of the built environment in achieving society's sustainable development agenda. The built environment can be central to the delivery of policies for sustainable development through the adoption of environmentally friendly design, procurement, construction methods and management practices towards the delivery of buildings and infrastructure. This paper presents preliminary findings of an exploratory study aimed at examining the role/impact of a SBE towards achieving the post-2015 SDGs. The study adopts a qualitative research approach that examines the role/impact of a SBE in achieving the SDGs through participatory research methodology. The focus group interactive workshop consisted of 8 academics and practitioners. The findings indicate that a SBE can significantly contribute to socio-economic development and well-being. The provision of smart cities and sustainable communities, sustainable design and construction of infrastructure and the provision of renewable energy technology such as solar on built assets are some of the role a SBE can play towards the attainment of the SGDs.

Keywords: built environment, sustainable development, sustainable development goals, SDG2030

INTRODUCTION

The adoption of the Sustainable Development Goals (SDGs) by the UN in 2015 marked a crucial moment for the global development agenda. The SDGs has been described as a "plan of action for people, planet and prosperity" (UN, 2015). The next generation development framework represents a paradigm shift towards socio-economic development. The 2030 agenda for sustainable development which comprises 17 goals, 169 targets and about 100 indicators represent a new direction for the global community (IRF, 2015). The new SDGs and the broader sustainability agenda addresses significant universal challenges to sustainable development that the Millennium Development Goals (MDGs) ignored such as environmental degradation, inequality, weak institutional capacity and unsustainable consumption behaviour in society(ICSU and ISSC, 2015). Unlike the MDGs, the SDGs are concise, easy to communicate and action-oriented (Sachs, 2012). Strandenaes (2015) however describe the SDGs as universal, integrated, interlinked, inseparable, planet-sensitive and

[1] a.opoku@ucl.ac.uk

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centred around people. The SDGs which reflect a global agenda towards socio-economic development is underpinned by governance and set out ambitious objectives covering the three sustainable development dimensions of economic development, social inclusion, and environmental sustainability (IRF, 2015; Sachs et al., 2016).

SDGs incorporate all the dimensions of sustainable development in a balanced and interlinked manner (UNEP, 2013) offering better understanding of the relationship between social, economic and environmental dimensions of sustainability (Glaser, 2012). The next part of the paper provides literature review on the SDGs, sustainable built environment and the impact a sustainable built environment towards achieving the SDGs. The third part presents the adopted research methodology, data collection method and analysis. The final part presents research findings and conclusions.

Whiles SBE and SDGs are two broad topic areas; this paper only presents preliminary findings of an ongoing study aimed at examining the role/impact a SBE can have in achieving the post-2015 UN SDGs by 2030. The limitations to this paper are that, the SDGs were agreed only in September 2015 and therefore little or nothing has been written about the link between SBE and SDGs. In addition, this exploratory study involves only 8 participants in a participatory focus group style workshop.

Sustainable Development Goals (SDGs)

The increasing determination of society to achieve sustainable development for all has been an influential factor for governments signing up to the 2030 agenda for sustainable development (Sachs, 2012). The SDGs has been described as the 'five Ps' plan of action for people, planet, prosperity, peace, and partnership. The goals will ensure that all people can achieve their full potential with pride and fairness and in a healthy environment (People); by taking serious actions on climate change to protect the planet from degradation (Planet); ensuring that all people can enjoy prosperous and rewarding lives (Prosperity); foster a society that is peaceful, just and inclusive (Peace) through global partnership and solidarity with all stakeholders (partnership) for sustainable development (UN, 2015).

At the heart of the new global development goals for the next 15 years aims at improving prosperity and wellbeing until 2030 by addressing the economic, social and environmental challenges that society faces today (Griggs et al., 2015; IRF, 2015). These transformational goals are universally applicable to all countries and tackle the challenges of eliminating extreme poverty, safeguarding environmental sustainability while achieving economic and social wellbeing. It also takes into account different realities, capacities and levels of development of various countries (UNEP, 2013). The MDGs targeted the poor and emerging nations but the SDGs is applicable to both developed and developing countries (Glaser, 2012). The 17 post-2015 United Nations SDGs are presented in Table 1. Vergragt and Quist (2011) believe that strategies, plans and process towards achieving the SDGs should be a multi-stakeholder process at both national and local government levels involving civil society, businesses, faith-based groups and academia.

Sustainable built environment

Achieving a more sustainable society requires the redefinition of the relationship between the built and natural environments. The built environment consumes lots of energy and resources whiles generating large amount of waste. The solution to this challenge is the design and construction of improved built asset supported by

appropriate management tools and regulatory frameworks that addresses sustainable development issues (Grierson, 2009). The built environment is literally a hub of economic activities, individuals and families, as well as society's cultural heritage.

Table 1: The 17 Sustainable Development Goals (SDGs)

Goal 1	End poverty in all its forms everywhere
Goal 2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture
Goal 3	Ensure healthy lives and promote well-being for all at all ages
Goal 4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all
Goal 5	Achieve gender equality and empower all women and girls
Goal 6	Ensure availability and sustainable management of water and sanitation for all
Goal 7	Ensure access to affordable, reliable, sustainable and modern energy for all
Goal 8	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
Goal 9	Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation
Goal 10	Reduce inequality within and among countries
Goal 11	Make cities and human settlements inclusive, safe, resilient and sustainable
Goal 12	Ensure sustainable consumption and production patterns
Goal 13	Take urgent action to combat climate change and its impacts
Goal 14	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
Goal 15	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Goal 16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Goal 17	Strengthen the means of implementation and revitalise the global partnership for sustainable development.

Adapted from (UN, 2015)

The built environment host economic activities, protects life and health, psychological and social welfare of its inhabitants, and sustain aesthetic and cultural values (Holm, 2003). The built environment involves human and cultural issues (why people build), environmental issues (natural and built context) and technological issues (materials, energy and financial resources, methods, and systems required to establish interrelationships and construct the built environment (Bartuska, 2007). Building for sustainable development involves using design and construction methods and practices, which strive for integral quality (including economic, social and environmental performance) in a very broad (or holistic) way (Grierson, 2009). Halsall (2011) explains that, the built environment is the physical human created surroundings such as roads, bridges, and building structures, contrasting that of the natural environment. The connections between components of the built environment, such as individual buildings, transport systems, urban landscapes and other

infrastructure are important. A sustainable built environment should aim at reducing environmental impacts in terms of energy, carbon, waste or water; this will involve creating a built environment that produces more than it consumes with environmental, social, cultural and economic benefits (Jenkin and Pedersen, 2009). Organizations can contribute to achieving sustainability by reducing their negative impact on the natural environment while increasing the whole life of built asset in the built environment (Poston et al., 2010). The conservation of historic cities is an effective strategy in reducing CO2 emissions when compared to their replacement by new buildings. New construction projects have more damaging impacts in short to mid-term; however conserving an existing building saves original energy and CO2 investment (Lewis, 2012).

Sustainable development goals and the built environment

Sustainable infrastructural development contributes to economic growth which in turn stimulates activities in other sectors of the economy (Lopes, et al., 2011; Dahiru and Mohammed, 2012). The built environment has a long-term impact on quality of life, prosperity, health, wellbeing and happiness of people and communities in terms of how planning, design, management and maintenance of the built asset (House of Lords, 2016). It is estimated that greenhouse gas emissions will rise to about 37% in 2030 compared to 2005 levels affecting the natural and the built environment if efficient policies are not implemented (OECD, 2008). Creating a sustainable built environment, through design, construction and management, enables all people to live well, within environmental limits. Built environment also needs to be flexible and adaptable to future uses, and be resilient to cope with local effects of climate change. Governments spending on infrastructure will enhance economic growth and delivery of essential services including the supply of clean water to the people (Nguyen and Culbard, 2014).

A SBE is becoming more important due to the growing impact of the built environment in achieving society's sustainable development. A sustainable built environment adopts design, construction methods and practices that make use of local expertise and experience (Grierson, 2009). According to a report by the House of Lords Select Committee on National Policy for the Built Environment, the climate change challenge can be responded to with a more holistic approach to built-environment issues by all stakeholders with emphasis on planning, landscape, architecture, conservation and engineering; planning system can play an important role in shaping our built environment (House of Lords, 2016)

Nguyen and Culbard (2014) add that failing to address global infrastructure needs will potentially reverse some of the positive gains from the MDGs and compromise the future of the SDGs. Sustainably planned and designed building development projects and urbanisation can improve land use, reduce resource consumption and improved congestion. This can positively impact on people, communities, local and national economies. Sustainable buildings and regeneration projects can also significantly contribute to social well-being (Wilson, 2015). Policies toward a SBE where individuals can live well and contribute positively in developing a sustainable socio-economic society should be a priority for policy makers (House of Lords, 2016). Infrastructure includes physical assets such as roads and bridges as well as the delivery of sustainable solutions for reliable energy, clean water, communications, logistics and mobility. It is estimated that about 60% of the world's population will live in urban areas by 2030 and this will be rapid in developing countries where there

is no infrastructure to support services such as clean water and sanitation (OECD, 2008). It is therefore important that the development of sustainable infrastructure and facilities that are resilient to possible environmental risk, sustainable in its construction and use that allows successful operation of business and services could enhance the efforts towards achieving the SDGs (Wilson, 2015). Achieving a sustainable built environment will impact on the society's ability towards the realisation of the SDGs. The construction industry is central to the delivery of many of the Government's policies for sustainable development through the provision of buildings, infrastructural development or contaminated land reclamation.

METHODOLOGY

This paper adopts the interpretivist/constructivist philosophical stance that argues that reality can fully be understood only through the subjective interpretation and intervention in reality (Creswell, 2003). The constructivist researcher is most likely to rely on qualitative data collection methods and analysis (Mackenzie and Knipe, 2006). In the qualitative research paradigm, the most important focus is for researchers to capture accurately the existing experiences and perceptions of participants involved in the phenomenon or process under investigation (Onwuegbuzie and Johnson, 2006). Qualitative method is concerned with words and images out of which the researcher seeks to interpret meanings and explanations as to the way people behave and to develop an understanding of social constructs. This study therefore adopts a qualitative research approach for data collection and analysis. Qualitative data was collected through participatory research methodology reflecting and exploring the experiences of research participants (Swain and French, 2004) and support the involvement of research stakeholders in the knowledge-production process (Bergold, 2007). It is about conducting research with and for the research subjects; research with the people rather than on the people.

Nothing has been written on the link between SBE and the new UN post-2015 SDGs in literature and therefore the adoption of qualitative data collection method is the most appropriate to capture relevant data and information for the study. In addition, the phenomena under investigation (SDGs and the SBE) are people-centred and therefore the adoption of participatory research methodology where the research stakeholders participate in the co-production of knowledge with the purpose of understanding social reality from the people's perspectives is justified.

The interactive focus group workshop consisting of two group of four members each facilitated by the researcher discussed the role of a SBE in achieving the SDGs. There were 5 academics and 3 practitioners from the UK construction industry selected through purposeful sampling. Invitations were sent to 12 potential participants but 8 accepted to take part in the study. Participants were selected on the basis of their expertise in sustainable development and the built environment. The workshop aimed at obtaining detailed information, perceptions and opinions from participants on the role/impact a SBE can have in achieving the SDGs. The one-day interactive focus group workshop discussed their understanding of SBE followed by a discussion of the link between SBE and each of the 17 SDGs. The ice-breaker for the participatory workshop was to discuss and establish participants understanding of SBE before linking that to how SBE can impact on achieving the SDGs.

DATA ANALYSIS AND DISCUSSION

This exploratory study aims at examining the role/impact of a SBE in achieving the SDGs. To achieve the research aim, qualitative data was collected through interactive focus group workshop made up of 8 participants; 5 academics and 3practitioners. The qualitative data were analysed by transcribing, identifying and coding the themes, interpreting and providing an explanatory accounts through content analysis. To examine the link between SBE and SDGs, the 17 SDGs were translated into four groups based on the level of impact/influence a SBE can have on each of the SDGs. The agreed impact levels were; High, Medium, low or no impact. The workshop team agreed that sustainable development Goal 3 (good health & well-being), Goal 6 (clean water & sanitation), Goal 7 (affordable & clean energy), Goal 9 (innovation & infrastructure) and Goal 11(sustainable cities & communities) will be impacted significantly by the delivery of a SBE. However a SBE will have a medium level of impact on Goals 1, 2, 4, 8 and 13; with low impact on Goals 5, 10, 12, 15, 16, and 17. The analysis of the goals identified the intertwined and the inter-linked nature of the SDGs as found in literature. For example Goal 11 which is about sustainable cities and communities is linked to Goal 6 (clean water and sanitation), Goal 8 (sustainable economic growth) and Goal 10 (reducing inequality).

The qualitative data from the interactive participatory discussion workshop showed that a SBE has a role to play towards achieving the SDGs. Delivering a SBE will influence society's ability to realise the new SDGs. The workshop participants worked in groups working through all the 17 SDGs to explore the role a SBE can play in achieving them by 2030. A summary of the findings is presented in Table 2. In order for the global community to achieve these ambitious SDGs, a fundamental change in the way society thinks and acts is needed. Developing a SBE can contribute greatly towards the global efforts of achieving the SDGs by the year 2030. Governments are one the major clients with the economic power to drive the adoption of sustainable practices by demanding sustainable built assets. The built environment can support the achievement of Goal 3 by delivering sustainable health facilities which can impact positively on the well-being of people. The design, construction and the provision of environmentally friendly and affordable housing for all can also support the above goal. The built environment role in achieving Goal 6 can be through the design, construction and management of facilities that support efficient water use and improved sanitation whiles the introduction of renewable energy technology such as solar on both new build and refurbished building can support Goal 7. A SBE is critical if Goals 9 and 11are to be achieved; the procurement, design and construction of infrastructural projects that addresses the triple bottom line of social(people), economic(profit) and environmental(planet) is key to the realisation of SDGs.

In respect of Goal 11; cities, communities and all places of human settlement should be made inclusive, safe, resilient and sustainable. The built environment should provide affordable housing for the poor and the disadvantage in the society as part of efforts towards achieving Goal 1. Also the construction industry provides employment opportunities for the unemployed people in the communities where built asset projects are undertaken to help eradicate poverty and improve people's standard of living. A sustainable built environment can play a role towards achieving Goal 2 through employment opportunities for local companies' involved in infrastructural projects for farming irrigation and food storage. In terms of Goal 4, training opportunities on employable and sustainable literacy skills can be provided to people to ensure the sustainable design, procurement and construction of educational facilities. Investment

in infrastructural projects will generate employment serving as a driver for economic growth in supporting Goal 8.

Table 2: SBE Role/impact in achieving the SDGs

Goal No.	Description	Role of sustainable Built Environment
Goal 1	No Poverty	Employment opportunities for communities where project are undertaken
Goal 2	Zero Hunger	Develop infrastructure for irrigation projects and food storage
		Employment opportunities for local companies
Goal 3	Good health & well-being	Deliver sustainable health facilities
		Provision of improved & affordable housing for all
Goal 4	Quality Education	Training opportunities on employable skills
		Sustainable design, procurement and construction of educational facilities
Goal 5	Gender Equality	Encouraging women to work on the operation and maintenance of built assets
Goal 6	Clean water & sanitation	Design and construct facilities that support efficient water & sanitation
Goal 7	Affordable and clean energy	Introduce renewable energy technology such as solar on built assets
Goal 8	Decent work and Economic Growth	Investment in infrastructure as a driver for economic growth
		Employment opportunities through SBE projects
Goal 9	Industry, innovation & infrastructure	Design and construction of sustainable infrastructure
		Retrofitting existing built assets to incorporate smart technology
Goal 10	Reduced inequalities	Ensure health safety and well-being of people on built environment projects
		Financial support for developing countries in infrastructural projects
Goal 11	Sustainable cities & communities	Developing smart and sustainable cities
		Development of Resilient communities
Goal 12	Responsible consumption and production	Sustainable use of constructed assets
		Conservation of historic cities instead of building new ones
Goal 13	Climate action	Design and construct resilient infrastructure that can withstand the challenges of climate change
		Develop planning policies that will deliver SBE to mitigate the risk of climate change
Goal 14	Life below water (Oceans)	**
Goal 15	Life on land (biodiversity)	Manage environmental impact of construction process
		Encourage the use of FSC certified timber on built environment projects
Goal 16	Peace, justice & strong institution	Social impact assessment on infrastructural projects
		Sustainable regeneration of crime/deprived communities
Goal 17	Partnership for the goals	Use the provision of a sustainable built environment (bridges, roads etc.) in developing countries as a driver for global partnership for sustainable development

**-No impact

In tackling the effects of climate change (Goal 13), the design and construction of resilient infrastructure that can withstand the challenges of climate change can be

achieved by the introduction of the relevant planning policies that will deliver a SBE that mitigate the risk of climate change.

Even where the impact of a SBE on the SDGs is low (Goals 5, 10,12, 15, 16, 17), the built environment should encouraging women and minority to work on the operation and maintenance of built assets; improving the health, safety and well-being of people involved in the delivery of built assets; promoting the conservation of historic cities instead of demolition and building new ones; ensuring that every timber used on construction projects are FSC certified and using regeneration projects a catalyst for change in deprived communities.

CONCLUSION

The UN post-2015 agenda for sustainable development represent a new direction for the global community, integrating social, economic and environmental sustainability into all policies and strategies with the view of eliminating poverty and inequality to achieve a more prosperous society. The preliminary findings from this exploratory study show that a SBE has a critical role to play in a achieving the SDGs; preserving the planet whiles providing prosperity for the people. The qualitative data reveals that developing smart cities and sustainable communities, sustainable procurement, design and construction of infrastructure, and the provision of renewable energy technology such as solar on built assets are some of the roles a SBE can play in achieving the SDGs. The built environment has much impact on some of the roles than others. For example, a SBE could highly influence the realisation of Goals 11(sustainable cities & communities), 9(Infrastructure &Innovation) and 7(affordable & clean energy). The construction industry is a key partner in the global effort to achieve sustainable development by 2030 through the development of sustainable infrastructural projects especially in developing countries. Therefore the built environment can act as a driver for realising the SDGs backed by right government policies and strategies. In this regard, governments across the globe should use the construction industry as champions to develop SBE through the provision of the right policies and regulations. As part of the ongoing study, additional data collection is to be collected to enrich and validate these preliminary findings. The study could impact on policy direction for various governments in using the built environment as a driver for achieving the SDGs.

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