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Handbook of Quality of Life and Sustainability

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International Handbooks of Quality-of-Life

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The International Handbooks of Quality of Life Research offer extensive bibliographic resources. They present literature reviews of the many sub-disciplines and areas of study within the growing field of quality of life research. Handbooks in the series focus on capturing and reviewing the quality of life research literature in specific life domains, on specific populations, or in relation to specific disciplines or sectors of industry. In addition, the Handbooks cover measures of quality of life and well-being, providing annotated bibliographies of well-established measures, methods, and scales.

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Handbook of Quality of Life and Sustainability

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Contents

1 Introduction: Quality of Life and Sustainability, Socio-spatial, and Multidisciplinary Perspectives

Javier Martinez, Claudia Andrea Mikkelsen, and Rhonda Phillips

This handbook compiles different studies related to quality of life and sustainability considering social, economic, environmental, cultural, and political/governance aspects as well as specific socio-spatial contexts. To achieve this aim and to provide a multidisciplinary perspective, the chapter includes authors from various disciplines, geographical contexts (Global South and North), and from different stages of their academic career.

The varying cultural and socio-spatial contexts of the authors in the selected cases contribute to a first-hand knowledge on quality-of-life realities and sustainability. Methodologically, the authors apply a wide diversity of approaches and tools, which facilitates a unique understanding of the interlinkages between quality of life and sustainability. In this way, the handbook provides a multiplicity of disciplinary, methodological, and scalar perspectives, given works at different levels such as country, urban–rural areas, and localities or neighborhoods. Some chapters include a policy dimension providing a link to policy and practice.

1.1 Sustainability and Quality of Life: Global Relevance

In 2015, all United Nations member states resolved by 2030 to:

> end poverty and hunger everywhere; to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure the lasting protection of the planet and its natural resources. We resolve also to create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all, taking into account different levels of national development and capacities (United Nations 2015, p. 3)

Members states are also committed:

> "to achieving sustainable development in its three dimensions—economic, social and environmental—in a balanced and integrated manner" and they "recognize that sustainable urban development and management are crucial to the quality of life of our people" (United Nations 2015, p. 9).

Transforming our World, the 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015 reflects the

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societal global relevance of the topics which are central in this handbook: sustainability and quality of life and incorporating space as a fundamental element, in particular in its observable category of territory (Schwarz and Streule 2016). In the next section, we elaborate on conceptual definitions.

1.2 Sustainability and Quality of Life: Theoretical Perspectives

The concepts of sustainability and quality of life share similar characteristics as both are multidimensional, multidisciplinary, multiscale, and offer complex and nuanced views on human progress and well-being. In this section, we untangle the conceptual specificities of both terminologies.

The increasing interest in sustainability had several milestones in the last century coinciding with the environmental crisis (e.g., 1970s global oil crisis and concerns over ozone layer depletion), the consequences of industrial and agricultural modes of production, the effects on food and health of the global population as well as key publications and global environmental movements [see, e.g.: *The Limits of Growth* (Meadows and Club of Rome 1972)]. Most significantly in the late 1980s, The World Commission on Environment and Development published *Our Common Future, The Brundtland Report* (World Commission on Environment and Development and Brundtland Report 1987). In 1992, the United Nations Conference on Environment and Development (UNCED) Earth Summit in Rio de Janeiro, Brazil helped foster more interest in sustainable development. Thanks to this global attention, sustainable development became the new global development tenet.

Several documents were approved toward these commitments such as Agenda 21, an action plan of the United Nations related to sustainable development (United Nations 1992); the United Nations Framework Convention on Climate Change (UNFCCC) and related follow-up conferences such as Habitat I, II, and III and the World Urban Forums. These global sustainability meetings and resulting agendas are relevant as they provide platforms for dialogue and exchange of ideas toward sustainable urban futures (Holden et al. 2008). In Habitat III, the United Nations Conference on Housing and Sustainable Urban Development also incorporates concern of sustainable urban development and quality of life in the Urban Agenda (United Nations Human Settlements Programme 2018).

Sustainability is also associated with intergenerational equity. The Brundtland Commission Report (World Commission on Environment and Development and Brundtland 1987) defines sustainable development as: "[a] development that meets the needs of the present without compromising the ability of future generations to meet their own needs." (1987, p. 43)

After this report, sustainable development gained not only academic interest but also the attention of a wider and diverse public audience. Currently, there is a common understanding that the guiding principle of sustainability is the recognition of equally important, mutually dependent and interrelated social, environmental, and economic dimensions.

Some authors may give differential relevance to each of the sustainability dimensions or include other ones such as governance and participation.[1] Martínez Castillo and Martínez Chaves (2016) identify seven sustainability dimensions and goals:

- *Environmental*: To preserve and regenerate the complexity and productivity of ecosystems, natural cycles, and biodiversity.
- *Economic*: To achieve an efficient and equitable economic development, for which eco-

[1] It is worth noting that in the preamble of the 2030 Agenda Sustainable Development, there is a reference to "People," "Planet," "Prosperity," "Peace," and "Partnership." The first three can clearly be associated to the social, environmental, and economic dimensions of sustainability and the last two concepts can be related to governance, inclusive societies and global solidarity.

nomic activity must be redefined according to material and immaterial needs.
- *Social*: To achieve equitable access to environmental goods, both intragenerational and intergenerational, between genders, and between cultures.
- *Political*: To enhance the direct participation of the population in decision-making, in a decentralized and democratic manner, and in the management of sociocultural and environmental assets.
- *Cultural*: To rethink the evolution of society toward sustainable production and consumption styles, which implies a change in the cultural patterns of society–nature relationship.
- *Educational*: To generate a process of awareness and social action on social and environmental problems and their alternative solutions, in a practical and objective way, without ideological ties.
- *Geographical*: To guarantee that the productive activities of regional economies promote the quality of life of the population and protect their natural and cultural heritage.

Given that sustainability is a multidimensional concept, it does not make sense to refer to "environmental" or "economic sustainability" (the latter also defined as "weak sustainability"), but rather of the sustainability of socio-ecosystems as a whole (also called "strong sustainability") (Galván-Miyoshi et al. 2008). A strong sustainability stance recognizes the need to reduce resource consumption, carbon concentration, and the implementation of a major transition and change (Holden et al. 2008).

Recently, some authors argue that economic growth is and cannot be environmentally sustainable and that development and growth cannot be sustainable. In exchange, they propose the concept of "degrowth" attached to a movement that involves grassroots innovations (e.g., work sharing, urban gardening, and community currency) (D'Alisa et al. 2015) and moving away from the idea that growth is continuous. The tensions and conflicts across the three dimensions of sustainability are made visible in what Campbell (2016) calls "the Planners Triangle" where development enters into conflict with social justice (property conflict), which in turn enters into conflict with environmental protection (development conflict), which conflicts with economic development (resource conflict).

To monitor the level of sustainability of countries and cities several initiatives and frameworks using indicators have taken place at the city level. Some of them make use of the notion of the "sustainable city" (Holden 2017).

> The sustainable city values the best parts of what have traditionally been considered a natural or rural lifestyle—clean air and water, fresh food, daily connections to local context and territory, plenty of time to relax and enjoy the simple pleasures of life—with none of the social and economic limitations also traditionally associated with rural life. (Holden 2017, p. 22)

One of the most recognized indicators initiatives at the city level was Sustainable Seattle (Holden 2006). Another initiative for comparisons at country level was the Sustainable Society Index, with a framework that includes human well-being, environmental well-being, and economic well-being (van de Kerk 2014).

In this chapter, we provide some of the most common definitions of sustainability. However, since there is not a collective understanding on sustainability and its dimensions, each chapter in this handbook provides its own view and theoretical approximation, in particular regarding how these dimensions relate to the quality of life.

1.3 Quality of Life

Similarly to sustainability, quality of life is understood as the combination of multiple domains (like those dimensions of sustainability) but with usually more precise definitions such as housing,

health, education, income, crime, leisure, culture, or access to green areas. Furthermore, quality-of-life literature distinguishes not only the objective but also the subjective quality of life recognizing satisfaction that people have with those and other domains. It is probably these characteristics of quality of life that facilitate the interplay between "scientific" knowledge and measurement tools (e.g., indicators) and specific policy goals and interventions.

Another similarity to the concept of sustainability is that quality of life is prone to interpretation from different disciplines. Psychologists, economists, geographers, sociologists, and planners have devoted much attention to issues of quality of life and associated concepts of well-being and happiness. Some express the notion of quality of life as a large conceptual umbrella under which terms such as happiness, well-being, subjective well-being, and life satisfaction interact (Mikkelsen et al. 2017; Phillips and Wong 2017). Each of these terms synthesizes specific traditions of discussion and theoretical reflection and may include broad or narrow conceptions within their definitions.

Quality of life reflects the well-being of individuals and societies, whether from the perspective of the satisfaction of individuals with particular life domains (Lee et al. 2002; Rapley 2003; Sirgy et al. 2000, 2010) or comprehensive quality-of-life scales (Cummins et al. 1997; Kelley-Gillespie 2009; Matarrita-Cascante 2010).

Tonón (2010) identifies the studies of Arthur Cecil Pigou, an English economist, as one of the first to probe, during the 1930s, the notion of what can be understood today as quality of life, as he was interested in the quantification of the services or social costs of government decisions from the welfare economy approach. Smith (1973) studied the geography of social well-being in the city of Tampa developing an index to measure social well-being at the intracity level. He identified 47 indicators grouped into six criteria: economic status, environment, health, education, social disorganization, and participation and equality. The work of Campbell, Converse, and Rodgers in the 1970s and from the University of Michigan, left a mark on the genesis of quality-of-life studies by inquiring about the perceptions, evaluations, and levels of satisfaction that Americans evidenced about personal life (Campbell et al. 1976).

The arrival of the 1990s marked a milestone in this historical journey, when the International Society for Quality-of-Life Studies (ISQOLS) was founded. With it, on the one hand, it was possible to incentivize and gather quality-of-life studies from different parts of the world, promoting interdisciplinary research, while also, on the other hand, it was possible to outline a favorable framework to coincide in a multidimensional and at the same time a synthetic definition of the quality-of-life concept (Tonón 2008).

No agreement exists as to whether quality of life should be limited to objective or subjective measures. Some studies place emphasis on the concept of objective quality of life and the observable characteristics including environment and/or personal characteristics, relying on objective indicators derived from secondary data (Li and Weng 2007; Apparicio et al. 2008). Other studies place emphasis on the concept of subjective quality of life and residents' perception and satisfaction with urban living conditions and their own lives, relying on surveys (Sirgy et al. 2008; Khaef and Zebardast 2016) or comprehensive analysis of components measuring well-being in the human experience (Diener et al. 2010). While much work focuses on individual quality of life, it can also hold relevance for overall community quality-of-life measurement, this is encouraging more inquiry into the collective level quality of life.

Objective approaches for measuring quality of life have high measurement reliability but they have been critiqued because of their low validity in assessing human well-being (Pacione 1982; Foo 2000). Moreover, it is reported that objective indicators have the disadvantage of underreporting, for example, crime, or overreporting issues such as income (Das 2008). Those advocating the use of subjective approaches argue that asking people their perceptions of quality of life is a valid and necessary data collection technique (Bramston et al. 2002; Ibrahim and Chung 2003; McCrea et al. 2005; Lee 2008). Some authors argue that

subjective methods are preferred over objective methods, particularly for planning and policy purposes, because they provide more valuable feedback and allow people to highlight their dissatisfaction with existing conditions (Ibrahim and Chung 2003; Veenhoven 2008). Subjective indicators offer valuable information when tackling community-based issues through a bottom-up approach.

Comprehensive approaches include both objective and subjective indicators, fostering a deeper understanding of quality of life (Cummins et al. 1997; Cummins 2000) as societal well-being and individual well-being are "inextricably linked" (Abbott and Wallace 2012). Some studies combine objective and subjective quality of life to identify four quality of life states namely well-being, deprivation, adaptation, and dissonance (Craglia et al. 2004; Tesfazghi et al. 2010) and use mixed-methods to explain the mismatch between the two (Berhe et al. 2014; Martínez et al. 2016). Furthermore, quality of life as a reflection of values existing in a community and gauging priorities and qualities of a community helps guide future outcomes (Phillips and Pittman 2009).

1.4 The Interdependence of Sustainability and Quality of Life

Quality of life and sustainability are interdependent. This is illustrated by the different paths that people and countries take to recognize the role of sustainability and the environment in their lives. In the Global South environmental dimensions in studies of quality of life seem to have emerged in the 1990s (Celemin et al. 2015) later than in the Global North. This could be related to the issue that countries in the Global South probably first strive for a better quality of life and economic development and only when they are successful the challenge of sustainability emerges (for example, a recognition of reduction of CO_2 emissions). In turn, qualitative changes in quality of life and happiness are required to achieve sustainable development beyond economic parameters (Guimarães 2003). There could also be a tension between individual behavior toward improving quality of life and sustainability goals at a larger scale.

1.5 The Assessment of Quality of Life and Sustainability: Methods and Tools

The relevance of the assessment of quality of life and sustainability is also reflected in the development of education curricula and the increase in related publications (Tonón 2020). Between 2005 and 2014, UNESCO lead the United Nations Decade of Education for Sustainable Development and authors developed standardized measures to test students' knowledge, attitudes and behaviors related to sustainable development (Michalos et al. 2012). In the same decade, online courses were developed on the sustainability assessment of cities (Kristin McIlhenney and Holden 2011). More recently, Massive Online Courses (MOOCs) on Sustainable Urban Development became available for free (see, e.g., MOOC offered by the Amsterdam Institute for Advanced Metropolitan Solutions (AMS).[2]

Quality of life and sustainability are currently seen as alternative measures of economic progress beyond Gross Domestic Product (GDP). Quality of life and sustainability assessments are being carried out at global, national, and local levels. Some examples include the Organization for Economic Cooperation and Development (OECD) "Better Life Index" (OECD 2020) at the global level. At the national level, examples are found in the "Australian Centre on Quality of Life" (Australian Centre on Quality of Life 2017), the Mexican "Sustainable Cities Index" (Banco Nacional de México 2018) or the Italian BES "Equitable and Sustainable Wellbeing" (ISTAT

[2] https://online-learning.tudelft.nl/courses/sustainable-urban-development-discover-advanced-metropolitan-solutions/

2019). At local levels, cities like Bristol (UK)[3] also implemented the systematic monitoring of quality-of-life conditions and made available the surveys as open data. Bottom-up initiatives at community levels are also emerging and in particular in relation to the concept of community well-being (Phillips and Wong 2017).

Geographic Information Systems (GIS) are commonly used to describe, monitor, evaluate, and explain spatial patterns and processes of sustainable development and quality of life (Maarseveen et al. 2019; Pfeffer et al. 2015). Several chapters in this book illustrate the use of GIS as a tool that can be used to inform policy.

In this handbook, some chapters focus on specific aspects of quality of life (housing—health) as well as socio-spatial determinants of quality of life (slums) and the impact that some phenomena have on the quality of life and well-being of communities (e.g., climate change, evictions, and rural shrinkage). The geographic variation of chapters in the book shows that both in the Global North and in the South people's lives are affected by similar problems, both created by unsustainable forms of development (economic-driven urban development patterns) or by their consequences on climate change. However, many of the conceptualizations and empirical approaches may be relevant and applicable to other contexts. We believe that the case studies are a starting point to identify perspectives that can inform the Global South and North in myriad ways.

1.6 Innovations

This handbook also contributes to new concepts such as "actionable social sustainability" or specific interventions that are informed by notions of development beyond GDP and growth. Recent urban paradigms such as smart cities or eco cities claim to be aimed at improving quality of life. However, it is unclear the extent to which they pursue progress to life improvements for all, or they are moved by a technological push and urban development for an affluent elite as it is already shown in some urban visions in the Global South (Watson 2014). There is also a risk that these new paradigms could trivialize or commodify the concepts of quality of life and sustainability and devoid them of their original meaning.

Transformative actions toward sustainable futures can only be successful if we recognize the context and structural conditions that shape lives. Inequality emerges in several chapters as an element that hinders sustainable development. It is well established that inequality affects several domains of life (Wilkinson and Pickett 2009) and health in particular (Marmot 2015). Bottom-up struggles and resistances for securing a better quality of life are present in this handbook such as the stop evictions movement as well as institutional planning tools for improving quality-of-life conditions such as tenure responsive land-use planning.

The multidisciplinary and multidimensional approach of quality of life and sustainability open the possibility of innovative solutions that would have been impossible in isolated disciplinary silos. Take the case, for example, of social farming projects. Some of the chapters in this book concentrate on specific needs in life: water, land, housing, health, environment, and transport/mobility. However, they do not bring in siloed perspectives as they are aware of the multidimensionality implied in quality of life and sustainability. Quality of life may affect population groups in specific ways, for those interested in this we suggest exploring the handbook series by Springer, articles in the ISQOLS journal, *Applied Research in Quality of Life*, or if interested in the collective level, see the Springer journal, the *International Journal of Community Wellbeing*.

The chapters are grouped into three main sections: foundations and concepts; tools, techniques, and applications; and innovations. The combination of sustainability and quality-of-life concepts and perspectives help to appreciate and unravel the multifaceted and interconnected nature of human, urban, rural, and spatial development. The following sections provide discussion and overview of the chapters within each part.

[3] https://www.bristol.gov.uk/statistics-census-information/the-quality-of-life-in-bristol

1.7 Part I: Foundations and Concepts (Theory, Conceptions of Sustainability and Quality of Life, Socio-spatial Aspects)

The first part of the handbook includes a selection of seven chapters. Chapter 2, "Tenure Responsive Land-Use Planning as a Tool for Improving Quality of Life: The Perspective Of Sub-Saharan Africa" by Uchendu Eugene Chigbu, identifies Sustainable Development Goals (SDGs) that are land-based and elaborates on the concept of land use planning which is tenure responsive. Contextualized in the narratives about quality of life by African experts it provides a framework on how a "Tenure Responsive Land-Use Planning" can play a role in achieving the SDGs. They present the human-to-land relationship embedded in land tenure within the socio-spatial environment as the path for quality of life to emerge. This is of particular relevance as lack of secure tenure is one of the challenges not only in the quality of life of Sub-Saharan communities but elsewhere across the world as well (see, e.g., Chap. 22 for a case in Europe or Chap. 15 for a case in Asia).

Health, as one of the key domains in quality of life, can be influenced by urban design. Ester Higueras Garcia, Emilia Román, and José Fariña develop criteria to reduce environmental health impacts on the elderly through urban design. In Chap. 3, "Guidelines for Healthier Public Spaces for the Elderly Population: Recommendations in the Spanish Context," based on the concept of the healthy city and international guidelines, the authors indicate the characteristics that urban streets and other public spaces must have to be safer and walkable. They consolidate urban design strategies in three main categories: *safe and walkable neighborhoods; nature-based solutions and more green areas;* and *intergenerational coexistence public areas*. The healthy city relates to several Sustainable Development Goals such as SDG 3, "Health and well-being" and 11, "Sustainable Cities and Communities."

Chapter 4, "A Multi-Perspective Discourse on the Sustainability of Water and Sanitation Service Co-Production in Global South Cities," by Giuseppe Faldi, Federica Natalia Rosati, Luisa Moretto, and Jacques Teller, develops a comprehensive understanding of the concept of sustainability when applied to the analysis of water and sanitation co-production. The study combines different theoretical perspectives and empirical evidence from four city cases (Hanoi, Addis Ababa, Cochabamba, and Dar es Salaam), with the purpose of framing a series of conceptual principles and criteria relevant for assessing the sustainability of water and sanitation service co-production in Global South cities.

The 2030 Agenda for Sustainable Development recognizes that democracy, good governance and the rule of law are key for sustainable development. In Chap. 5, "Rwanda: Planned Reconstruction for Social Quality" Pamela Abbott and Roger Sapsford critically look at Rwanda's reconstruction as an example of social engineering conducted to enhance quality of life. It demonstrates that improving living conditions for a population is not something individuals can do alone but also shows the tension between top-down state control and the possibility of having pluralistic voices.

In Chap. 6 Damián Molgaray provides "A Theoretical Reflection Based on Children's Opinions about their Safety to Rethink Different Dimensions of Sustainability in Cities." This chapter makes use of qualitative methods such as drawings to elicit the safety-related situations and sensations experienced by children in relation to a cemetery in their neighborhood. In a theoretical reflection, the author investigates the (violent) historical memory related to the cemetery and how the figure of the cemetery itself may contribute to the debate on the scope of the concept of sustainability from three dimensions: spatial, symbolic, and political. It also reflects on the obstacles that a climate of fear and uncertainty can imply for sustainable urban development as proposed by the Sustainable Developing Goals aiming at the eradication of violence and the promotion of social cohesion.

In Chap. 7, Andrea Höltl, Tania Berger, Romana Bates, Meseret Kassie Desta, Ainsley Lewis, Daniel Semunugus, and Hussain

Indorewala elaborate on the nexus between the SDGs and the quality of life drawn from their experience in an education consortium of European, Indian, and Ethiopian Universities. In "The Nexus of the UN Sustainable Development Goals and their Link to Quality of Life: A Case of Urbanization in Ethiopia and India," they show how relevant domains of quality of life affecting marginalized groups (e.g., housing and informality) can be incorporated in the curricula of higher education. Strategic global objectives such as the SDGs are linked to local realities through education.

In Chap. 8, "Multiple Perspectives on the Meaning and Effects of Resiliency," Andrew Kim, Soomin Kim and Stephen Buckman assert that quality of life can be ensured by physical safety derived from proper resilience and relative sustainability based on grassroots and communities. They illustrate their chapter with examples derived from catastrophes affecting the quality of life of communities such as Hurricane Katrina and the Fukushima Daiichi Nuclear Disaster.

1.8 Part II: Tools, Techniques, and Applications (Case Studies and Methodologies)

The second part of the handbook consists of a selection of 13 chapters covering case studies in the Global North and South. In Chap. 9, Patrick Guyer, Caroline van Koot – Hodges and Boudewijn Weijermars present the work entitled, "Are Expanded Resilience Capacities Associated with Better Quality-Of-Life Outcomes? Evidence from Poor Households Grappling with Climate Change in Bangladesh, Chad, India and Nepal." In three comparative case studies, the chapter explores whether poor households with greater resilience capacities also enjoy a higher quality of life. One of the contributions of the chapter is that it demonstrates that expanded resilience capacities and in particular transformational resilience capacities are associated with a better quality of life.

The next chapter investigates a case in Mexico at an intra-urban level. Chapter 10, "Sustainable Latin American Cities? Evaluation of the Sustainability of the City of Puebla (Mexico) Using Indicators" by Laura Zulaica, Emilia Lara Galindo and Ángel David Flores Domínguez, makes use of an index of sustainability. The purpose of the index is to assess the level of sustainability at sub-city levels.

Robin Goodman, Annette Kroen, and Melanie Davern present a case in Australia where they illustrate the interlinkages between main concepts of this handbook and mobility. In Chap. 11, "Quality of life, Sustainability, and Transport: The Case of Melbourne, Australia," they show how better accessibility and more diverse forms of transport would not only contribute to resident's subjective well-being but also improve sustainability. For example, gas emissions could be decreased with the use of more diverse, sustainable modes of transportation. This is of particular relevance as many cities in the world are structured around motorized transport and cars.

Another important aspect of sustainability that affects the quality of life of vulnerable residents is territorial equity. By making use of a geographic information system, Chap. 12, "Territorial Equity Measurement in Buenos Aires Province (Argentina)" by Alejandra Auer; Claudia Mikkelsen and Sofia Ares, map out variations of quality of life within the province of Buenos Aires. The index includes quality-of-life dimensions such as Education, Communication-Connectivity, Water and Health, Dwelling, Economic Activity and Employment, and Environment. These types of methods with geo-spatial perspectives are relevant as they enable the monitoring of one of the SDG goals (Goal 10) aiming at reducing inequality within and among countries.

In Chap. 13, "Protecting Quality of Life: Protected Needs as a Point of Reference for Perceived Ethical Obligation" Rico Defila and Antonietta Di Giulio theoretically situate their case in the salutogenic definition of the "good life" of protected needs. The authors posit that quality of life for all people is the ultimate goal of sustainable development. The main question of the case is to what extent the theoretically ethical obligation of providing the conditions crucial for achieving well-being for the present and future

generations coincides with peoples' perceptions? By surveying a representative sample of Switzerland, the authors empirically show that ethical obligation of warranting need satisfaction for present and future generations corresponds to perceptions of obligation.

Guillermo Ángel Velázquez and Juan Pablo Celemín map the spatial variation of socioeconomic and environmental dimensions of quality of life in Chap. 14, "Geography and Quality of Life in Argentine Regions: Socioeconomic and Environmental Inequalities." By making use of objective and subjective measures and by combining several data sources in a geographic information system, they are able to expose the unequal quality-of-life conditions between Argentine regions.

In Chap. 15, "A City for Whom? Marginalization and The Production of Space in Contemporary Bangalore" Chloe Pottinger-Glass and Karin Pfeffer focus on working on the rapid changes that have taken place in cities, on the urbanization process and urban regulation through a particular case, and on the removal of slums in Bangalore, India. Critically, they explore central studies, and categories such as the right to the city, subordinate urbanism, and social marginalization. Using a qualitative methodology, and applying techniques such as semi-structured interviews, discourse analysis, and spatial mapping, the authors analyze urban change.

"Risk Management of Groundwater Pollution, Sustainability and Quality of Life: The Gap Between Policy and Practice in an Intermediate City of the Global South," by Agustina Barilari, Gabriela Calderón, and Hector Massone provide an interesting reflection on the right to safe water seen from sustainability and quality of life. In Chap. 16, they aim to analyze the relationship between sustainability and quality of life from the perspective of the risk management of groundwater contamination by comparing policies with practices, that is, the gap between what should be and what really is. In this case, the focus is placed on the city of Mar del Plata, Argentina, applying a qualitative nature methodology, where the analysis of documents and the study and evaluation of interviews are central.

Deden Rukmana and Na'Taki Osborne Jelks focuses attention in Chap. 17 "Exploring the Association between Health Disparities and Neighborhood Characteristics: The Case of Diabetes Mortality in DeKalb and Fulton Counties, Georgia" on health dimension linked to the sustainability and quality of life of subjects, specifically attending to the situation of chronic noncontagious diseases. As in other works, it recovers the neighborhood scale and proposes to analyze diabetes mortality by race and to identify socioeconomic factors of neighborhoods associated with the distribution of diabetes mortality in two United States counties, DeKalb and Fulton Counties in the State of Georgia from 2013 to 2017. The author uses information from the censuses analyzed in the GIS environment.

In "Quality of Life in Relation to Urban Areas and Sustainability. Application Case: City of La Plata, Buenos Aires, Argentina", Chap. 18, Carlos Discoli, Irene Martini, and Dante Barbero contribute to the conceptual and methodological debate of the collective dimension of quality of life, sustainability, and urban space, reflecting specifically on La Plata, capital of the province of Buenos Aires, in Argentina. The authors refer to the use of a comprehensive methodology with the use of Geographic Information Systems.

In Chap. 19, "Social Sustainability, Neighbourhood Cohesion and Quality of Life: A Tale of Two Suburbs in Calgary" Sasha Tsenkova and Karim Youssef bring us closer to the city of Calgary in Canada. In this case, the neighborhood appears as a scale of analysis, where they explore social sustainability and quality of life. In a context of population growth in suburban areas, the emphasis is on the smart growth of cities. To do this, they evaluate the neighborhood cohesion focusing on four dimensions: psychological sense of the community, attachment to the place, social interaction of the residents, as well as their correlations with the uniqueness of the neighborhood.

Kimberly E. Zarecor, David J. Peters, and Sara Hamideh in Chap. 20, "Rural Smart Shrinkage and Perceptions of Quality of Life in the American Midwest," propose a reflection on the contraction of the rural population, contributing to

the debate on smart contraction in a context where rural depopulation must, in general, be understood as a fact. To do this, they bring us closer to the state of Iowa, where for 25 years they have studied small rural towns. Methodologically, they address 98 small towns in Iowa and then focus on seven of them to work on the perception of the quality of life of their inhabitants.

In "Ecosystem Services of Ecological Infrastructure and Quality of Life: Contributions to the Analysis of the Sustainability of the Urban and Peri-urban Area of Mar del Plata, Argentina," Chap. 21, Camila Magalí Mujica and Clara María Karis bring forward a debate on ecosystem services. This relates to the presence of green spaces in cities, incorporating the concept of resilience addressed in the theoretical section, and quality of life, in this case in a mid-sized Argentine city such as Mar del Plata. They concentrate on analyzing the temperature regulation ecosystem service provided by green areas. On account of this, they use a quantitative methodology incorporating a series of objective indicators that contribute to the study of Urban Ecosystem Services (UES).

1.9 Part III: Innovations

In the third and last part of the book, six chapters are included which stand out for their innovation in the methodologies they apply, their conceptual debates, or their proposals for the future. Chapters include discussions contributing to studies of quality of life and sustainability in a spatial sense.

The first of this section is Chap. 22, by Eva Álvarez de Andrés and is entitled "An Innovative Practice of Social Sustainability: The Fight for a New Housing Legal Framework in Spain." It is a critical text that places us in Spain and again, as in other chapters, refers to the right to housing as a dimension of quality of life. It describes the types of resistance that the subjects applied in Spain in the context of crisis, creating the social movement called "Plataforma de Afectados por la Hipoteca" (PAH)—"Platform of (people) Affected by Mortgage" in 2009. It shows how access to housing is directly related to other dimensions of quality of life such as physical and emotional well-being or social welfare, and the struggle to improve living conditions. The methodology meant a review of the literature on housing policies in Spain since 1950. The PAH has been examined through participation in assemblies and the analysis of social networks. The author applied interviews and analyses of writings in the press.

In Chap. 23, "Cities Rethinking Smart-Oriented Pathways for Urban Sustainability" Mauro Romanelli provides an interpretative framework to identify the development trajectories that are being promoted in some cities. To do so, he focuses on reflecting on sustainable cities as smart cities. The author reviews the cases of Berlin, Paris, Vienna, and Florence. Although smart cities seek sustainability and common welfare, the author expresses the need to think about the dangers and risks that arise from the use of technology, which would constitute the dark side of urban development, for example, from the excessive intrusion of public surveillance.

In Chap. 24, "Public Useable Space as a Catalyst for Quality-of-Life Improvement: The Case of Cape Town's Social Farming Projects," we arrive at Cape Town in South Africa. This chapter is authored by Astrid Ley, Kurt Ackermann, Silvia Beretta, Sigrid Busch, Jan Dieterle, Manal M.F. El-Shahat, Jilan Hosni, Franziska Laue, Yassine Moustanjidi, and Veronika Stützel. The objective is to identify the key characteristics that could influence the planning and formulation of policies to improve quality of life through useable public space. For this, they focus on unraveling the role of urban agriculture as an agent to activate public space and public life in the context of the Global South. The methodology used was to examine the notions of quality of life and public space in the academic discourse as well as through policy documents and gather qualitative data on these dimensions of quality of life: public space and placemaking.

In Chap. 25, "The Potentials and Risks of Wadis in Cities in the Gulf Region" Wolfgang Scholz, Mathias Kaiser, and Matthias Pallasch

refer to the importance of reusing and caring for water in the context of scarcity of such an important good, especially in environments of extreme aridity such as that of the Gulf cities in the Middle East. The authors refer to the importance of the reuse and recycling of wadis, that is, beds of rivers that remain dry for a long time. These can be onerous spaces although with great potential, for example, the ability to green the city. The main objective in Muscat, Oman, was to identify resident's needs, to analyze spatial potentials and to develop technical approaches for a transformation of wadis into green urban spaces for recreational activities, including GIS analysis, expert interviews, surveys among residents, exploration of sites, and workshops.

As stated in Chap. 26, "The Crossroads on the Path to Sustainability while Aspiring for a Better Quality of Life: A Case of Delhi," by Bibhu Kalyan Nayak and Pushkala Rajan, the diverse contexts have made "sustainability" a complex problem. In a globalized world, defining sustainability does not essentially follow a standard process. This job is an effort to understand such complexities through the case of Delhi, of India. In this nation, the percentage of urban population is rapidly increasing, along with pollution, making indoor, and outdoor environmental quality more at risk. The authors present us with the challenge of thinking about environmental quality in buildings where the inhabitants of the cities reside and work daily.

Carlos Zeballos in Chap. 27, "Urban Linkages: A Methodological Framework for Improving Resilience in Peri-urban Areas. The Case of Arequipa, Peru," transports us to Arequipa in Peru, where he proposes a methodological framework related to resilience in peri-urban spaces. The author connects to previous chapters through the proposal to form an integrated model to improve resilience in suburban areas prone to various risks based on the participation of three fundamental actors: planners, population, and political authorities.

Through the presentation of this handbook and its 27 chapters, we are hopeful that more discussion, research, and connection between quality of life and sustainability will occur in spatial and multidisciplinary contexts. As challenges continue to emerge, there will be much interest in exploring the approaches presented in the handbook, as well as fostering a deeper understanding of what can work in our communities and regions. We encourage readers to continue to explore these important interrelationships as quality of life will be impacted by work in these areas.

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Part I

Foundations and Concepts (Theory, Conceptions of Sustainability and Quality of Life, Socio-Spatial Aspects)

Tenure Responsive Land-Use Planning as a Tool for Improving Quality of Life: The Perspective of Sub-Saharan Africa

2

Uchendu Eugene Chigbu

2.1 Introduction

Land (including other natural resources) is contentious in multifaceted ways. It is a crucial element in economic production and capital investments. It is also a tool for human settlement development because it provides space (and place) for community building. Globally, it is a crucial part of socioeconomic development at global, national, and local levels. In sub-Saharan Africa (SSA), land is the critical factor subsistence living and identity of people (Dube 2008). Nonetheless, forced evictions from the use of land—that violates civil, political rights and socio-economic rights of people—are commonplace in the SSA region. These incidences of forced evictions often violate the rights of people to farm, use of forest resources, housing, and the enjoyment of leisure, and the general use of land with a peace of mind. It impedes access to resources which is a crucial entry point to attaining sustainability of land and natural resources based livelihood. A lack of access to land (and other natural resources lead to inequality by excluding people from enjoying the opportunities "to use their real properties through unfair compensation or forced sale that leads to the concentration of land resources into the hands of rich people" (Uwayezu and de Vries 2018, p. 1). Further implications are that it leads to a situation whereby the socio-spatial order of human settlements is reconfigured on property bases—that is, those with secure rights to land enjoy better living conditions than those who lack access or are insecure. Forced evictions (especially when done in city slum) produce "differential effects on various social groups" and the cities' socio-spatial order, thereby boosting the quality of life (QOL) of propertied citizens and negatively affecting those of the evictees (Patel 2016, p. 29). However, these scenarios occur because of a lack of land-use planning that is capable of securing people's rights on land in many African countries. Attempts to mitigate these situations of insecurity are needed to promote spatial justice, which is a crucial factor for developing balanced socio-spatial orderings and development.

The ownership and use of land—including exercising rights and privileges over land—are essential dimensions of wealth creation (Chigbu et al. 2016). These are what make land—through its ownership, mode of holding, use of resources, the exercise of rights, and access to privileges from its use—directly linked to people's quality of life. This is because the planning of land uses and improvements in the manner in which people own (and exercise rights over) land are pertinent for achieving the global Sustainable Development Goals. To improve the quality of life of people anywhere, land-uses must be planned to deliver pro-poor outcomes. However, this is only

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possible if the ownership and exercise of rights over land are protected from unlawful acts that could impede peoples' rights to enjoy the use of land. Land-use planning (LUP) and land tenure security (LTS) are crucial elements in improving the QOL of people from a land management context. LTS is a condition commonly associated with land-use and ownership. LUP is a process often applied to (re)set socioeconomic and environmental conditions to enable sustainable use of land. Together, LTS and LUP are powerful development tools because they influence the QOL of land users (and owners) and those of communities in general. They are often implemented in isolation from each other in many developing countries. However, studies show that where the two have been combined and applied in selected countries, they have led to the alleviation of poverty or the improvement of food security (Chigbu et al. 2016).

2.2 The Approach to the Study

The focus of this chapter is on the application of tenure responsive land-use planning (TR-LUP) for QOL in SSA. The following sections of the chapter begin by presenting the narratives about QOL used to draw the generic meanings of QOL used in this chapter. Then it defines QOL and TR-LUP and establishes their relationships with other associated concepts. Then it provides a picture of the quantum of land challenges in SSA that affects the QOL negatively. It then describes what makes TR-LUP capable of generating QOL. Then it objectifies QOL in the context of the global Sustainable Development Goals (SDGs). Furthermore, it identifies TR-LUP activities and how it can catalyse QOL improvements in SSA; and then, concludes. To conceptually deconstruct QOL, and then frame a TR-LUP approach to improving QOL in SSA, it is necessary to understand the land management perspective of QOL. This chapter approaches this by documenting an empirical perception of SSA people concerning what QOL means to them in the land context. It uses the narratives of QOL as told in SSA own voices (collected using direct interviews and e-Focus Group Discussions or e-FGD) to provide the insights needed to understand the issues of QOL in SSA. Scholars who have used e-FGD include Chigbu (2019a–c), who used it for data collection (particularly for scenario sampling). "An e-FGD, unlike a traditional FGD, involves the use of information and communication technologies to gather people from similar backgrounds or experiences to discuss a particular topic of interest" (Chigbu 2019a, p. 43). The use of narratives to address the question of what QOL means in SSA context was necessary because "studies that directly involve investigations into societal concerns or social challenges" necessitate the use of "methodological approaches dominated by verbal narratives" (Chigbu 2019d, p. 1).

2.3 Understanding QOL by Listening to Voices of SSA People

Evidence from selected narratives on the issue QOL (from across SSA countries as is discernible from the following responses) shows the length and breadth of the meanings and perceptions of QOL in the SSA region (Table 2.1).

Table 2.1 is a list of allusions about QOL from across SSA. From these allusions, it is possible to decipher the meaning of QOL in the context of SSA, as well as the tone of the ongoing discourses about QOL in the region. They show that QOL is a multi-dimensional concept and reality. It has its philosophical, ideological, spiritual, religious, economic, political, environmental, and cultural aspects (among many other dimensions). These QOL reflections also show that it is both a realistic and perceptional conditions of living that cuts across personal, community (group), gender, race, and national levels. The QOL reflections also show that QOL can be based on self-targets (as in the case of individuals, households, and communities) or imposed targets (as is in the case of government policies) for fulfilling the primary or secondary needs of people.

Table 2.1 Allusions of country-contexts of quality of life from selected countries in sub-Saharan Africa

Countries of e-discussants	Allusion of Quality of Life (QOL) in country context
Uganda	"Look at my worn-out shoes. . . Look at my dilapidated house. . . Look at my little child who is at home during school hours. . . Look at our irresponsible government. Look at my sick, elderly mother who is at home because I cannot afford to take her to the hospital. . . That is what quality of life looks like here"
Nigeria	"Look at the economy of Nigeria... A lot of our people are hurriedly emigrating in search of refuge in Europe and the United States. That says loads about the quality of life. Ours is scary while theirs is inviting"
Namibia	"The health status of people in relative and real terms is their quality of life.. It has its psychological, physiological, environmental, and socioeconomic dimensions. It is also an issue of identity, heritage, and culture. When any or some or all of these dimensions are healthy, then it reflects the quality of life in general, specific or partial ways. . . being healthy means that they are as expected by the people, individual or norms set by the society"
Kenya	". . .It is the presence of access to food and housing, to quality education and health care, to employment that will sustain us. In my experience, it also includes intangibles such as job security, land tenure security, political stability, individual freedom, and environmental quality. . ."
Gabon	"Quality of life. . . kind of the living condition that shows whether we are happy and satisfied with the situation of life around us. It is to me personally, but here in Gabon, we have national situations that represent the quality of life of our nation. It also can be different from communities, regions, and households. . ."
Senegal	"The state of peace, spirituality or political stability, physical security; and moral, economic and social development available for people to enjoy. That is what quality of life means to us here. It is much more than whether we have food to eat today or water to drink today or house to live in today or clothes to wear today or money to buy whatever we need today. . ."
South Africa	"The true nature (or the perception) of your freedom to interact with others of the same or different races, ethnicities, cultures, sexes, and ideological leanings... These are to me, first and foremost, quality of life"
Ethiopia	"The description of your national, group, household, or personal life story based on lived human experience. . . however, the story ends as at the time you told it, irrespective of whether it is good or bad or sad, or crisis-ridden or peace or joyous or reflects confusion. . . that is your quality of life"
Tanzania	"Quality of life reflects the condition of a household in meeting their self-targeted basic needs. For instance, their needs for food, shelter and clothing, and so on. . . In some cases, happiness, joy, self-esteem and many other aspects of life are secondary because life starts with basic needs..."
Djibouti	". . .Quality of life indicates well-being as well as the entire scale of human experiences, states, perceptions, and domains of thought concerning standards of living or life. It also involves judgments of the value placed on the experiences of communities regarding satisfaction with life and happiness across typical aspects of daily living such as health, income, education, work, family, and leisure. . ."

Source: based on author's fieldwork

2.4 Towards Defining and Relating QOL and SDGs to TR-LUP (and Its Associated Concepts)

2.4.1 Putting the Concept of QOL into Perspective

The QOL narratives on SSA are indicative that people's health, attitudes, income, experiences, and many externalities (such as socio-political situations) affect their QOL. From the land management lens, it is logical to conclude that these reflections are following what is available in the literature on QOL (see Bendzko et al. 2019; el-Aswad 2019; Sait et al. 2019; Gwalebe and Chigbu 2020).

The study of QOL in land management is old. Earliest efforts on the subject have focused on the

agricultural or food security dimension of the issue. The World Health Organization (1997, p. 1) defines QOL as "individuals' perception of their position in life in the context of the culture and value systems in which they live and about their goals, expectations, standards, and concerns." This broad definition when synthesized implies that QOL is about the improvement of living conditions of people. The definition considers that the state of people's psychological, physical and environmental particularities (including their freedom, social relationships, and personal beliefs) must be in a healthy condition for a quality of life to be seen to have improved. In some ways, quality of life (whether good or bad) could be normative because it hinges on particular conditions of people's way of life (due to personal interests to enhance the state of their wellbeing). What this means is that different people may experience QOL differently under the same conditions. However, it has several dimensions to it, including the "physical, political, moral, social, environmental, and spiritual dimensions" (Pinto et al. 2017, p. 7). Land has always been recognized as a factor of production in economics (and so it is a factor of development). It is a substantial factor in the improvement of quality of life. Many developing countries are nations where land rights remain unprotected. The rich (everywhere) comprises mostly of individuals with secure land (or property) investments. In ancient times, landowners were lords (or ladies), and land renters are serfs. These are evidencing a linear relationship between land and quality of life. That is why Chigbu et al. (2019c) asserted that the appropriate planning of land resources could directly support improvements in the living conditions of people (quality of life). This study posits that such planning of land resources must take a particular form for it to have the desired quality of life effect on people. Hence, it argues for a tenure responsive land-use planning approach to QOL improvement.

2.4.2 Linking QOL to TR-LUP: Relationships with LUP, LTS, LT and SDGs

To understand how TR-LUP relates to the QOL in the land context, six major concepts are worth understanding. These concepts (in addition to TR-LUP and QOL) include land tenure (LT), land tenure security (LTS), land-use planning (LUP), and sustainable development goals (SDGs). Knowing these concepts and their relationships are relevant in the process and outcome of land-based development interventions. Hence, it is vital to unpack their meanings and relationships. They all have a relationship with land. Together or individually, they have causal relationships with QOL (in whatever form QOL is understood).

Figure 2.1 shows a conceptual delineation (and graphic correlations) of these concepts, depicted within a set of graphical spaces to visualize how they intercept and overlap each other. It depicts QOL and TR-LUP as overarching concepts and praxes (respectively) because they apply (conceptually and practically) to all areas of life and knowledge related to land use. They also apply to the other concepts in terms of their objectives. Although their definitions may vary, QOL is widely known to represent an individual's perception of their living conditions (Pinto et al. 2017) while TR-LUP is known to be a pathway to achieving QOL (Chigbu et al. 2019a–c). In specific terms, QOL and well-being are used interchangeably in the literature (Valiente et al. 2019). It is essential to acknowledge that human needs are what leads to the quest to gain quality of life. Meeting these needs leads to satisfaction in people's living conditions (or well-being).

This chapter considers QOL interchangeable with well-being because QOL entails the state or conditions in which people live within a specific place and over a particular time. The issue of time and place is essential in understanding QOL because it is a condition which is consistently in a state of flux or highly fluid. QOL is subjective.

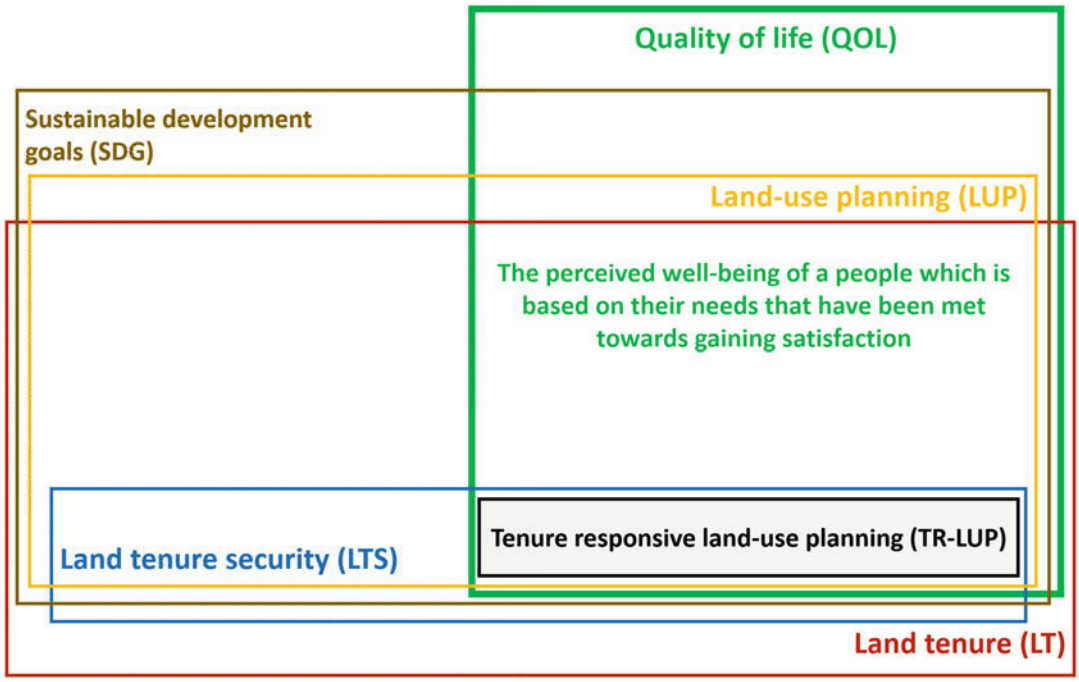

Fig. 2.1 The conceptual relationships shared by the terms used in the study (source: author's diagram)

It manifests in different ways. In addition, the targets (or indicators) needed to achieve QOL can vary. It is capable of changing from place to place and from time to time. In the context of land management, QOL reflects the living conditions that people enjoy or suffer. The enjoyment of adequate space, beautiful vegetation, affordable food quality and quantity, affordable health care, and education can be evidence of positive QOL. Access to safety, freedom of decision-making, and access to infrastructure that enable comfort and respect to privacy (among many others) are indicative of a good QOL. In the contexts of LUP, LT, LTS, SDGs, and TR-LUP, different forms of QOL targets are what most development projects directly or indirectly seek to achieve. Hence, QOL is an embedded concept in all of the other five concepts (LT, LUP, LTS, TR-LUP, and SDGs), which are policy-based concepts for achieving QOL.

The SDGs are embedded in the concept of sustainability. Sustainability is a highly dominant concept and discipline in development studies. It puts focus on protecting the conditions of humans and their natural environment without compromising the QOL of present and future generations. There is no agreed understanding of the concept of sustainability in literature. However, the SDGs and its targets, provide a view of a combination of sustainability and QOL in a development context. The SDGs are a set of seventeen global development goals. The United Nations (UN) adopted the SDGs in September 2015. The UN tasked all nations to eradicate poverty and achieve the SDGs during 2016 and 2030. The SDGs are, therefore, an embodiment of the sustainability ambitions of governments around the world. It is a concept created to provide opportunities for making a positive change in the QOL of people all over the world. LUP and TR-LUP have a relationship with SDGs because they are processes that can lead to the achievement of the SDGs (which is a development vision). LT and LTS are conditions, which, when well-directed, can lead to the success of specific goals of the SDGs. It is the process of TR-LUP that can make it possible. As a development vision, the SDGs cover a wide range of

targets necessary for improving QOL. These issues include economic growth, hunger, poverty, health, gender issues, education, employment, climate change, urbanization, land, and natural resources, peace and security, and sustainable consumption and production (among others). They relate to SDGs 1–2, 5–11 and 15–16 which have a direct relationship to quality of life. So, one of the conditions for influencing QOL is the achievement of the SDGs.

LUP is a very contentious concept. LUP implies all "activities and decisions concerned with guiding the allocation and use of land in patterns that enable improvements in people's way of living and their environment" (Chigbu and Kalashyan 2015, p. 8). It involves organizing land uses in ways "that will be beneficial to people who live on or use the land" (Chigbu et al. 2016, p. vi). In principle (and in practice in all countries), LUP activities are "rooted in ensuring improved livelihood options, community cohesion, and food security" (among many other objectives) (Chigbu et al. 2019a). The primary goals of LUP entail achieving QOL outcomes—e.g., improved housing, better agricultural production, increased environmental protection, and reduced climate risks, among many others.

Relevant to LUP is the issue of LT and LTS. The concept of LT means "the relationship among people as individuals and groups on land and other natural resources" (Chigbu et al. 2016, p. vi). This human-to-land relationship is the socio-spatial environment for QOL to emerge. It is also linked to efforts at achieving (in the form of land policy implementations) conditions (such as LTS and SDGs) through development processes (such as LUP and TR-LUP) that influence QOL. Land tenure is critical to changing QOL because how land is used and the mode in which rights are held influence the outcome of development. LTS is the "rights individuals and groups have to effective protection by the state against forced eviction" (UN-Habitat 2008, p. 4). "It implies protection against temporary or permanent removal of individuals or groups from the enjoyment of interests in land—such as access, use, ownership, rights, and legal or social privileges from land—by vested interests or governments" (Chigbu et al. 2019b, p. 371). In carrying out development activities on land, LTS serves as a catalyst because it promotes and secures the rights and privileges of people (especially land users and landowners) who own and use land. By doing this, it protects them against any actions that could limit their enjoyment developments on land from vested interests.

The concept of TR-LUP evolved due to the need to improve LTS using LUP practices. Usually, LTS issues and LUP have primarily been separately implemented in planning practices. This was the case because LTS is meant to have been in place before LUP implementations. However, LUP and LTS (as two different concepts and praxis) can be combined to achieve better development outcomes or quality of life (Chigbu et al. 2016, 2017). The simultaneous implementation of LUP activities and LTS is what led to the emergence of TR-LUP (a concept that stands in the intersection of LUP, LT, LTS, SDGs, and QOL).

From the preceding, a direct relationship emerges — any improvement or change (Δ) in any of LT, LTS, SDGs, LUP, and TR-LUP; will lead to a corresponding change in QOL. This implies that any action (whether single or combined change) made by LT, LTS, SDG, LUP, or TR-LUP will influence or cause a positive or negative change in QOL. Therefore, QOL is a function of LT, LTS, SDG, LUP, or/and TR-LUP. Aligning with de Vries and Chigbu's (2017) viewpoint of the same issue (in land management context), the author mathematically expresses it as follows:

$$\Delta QOL = f\left(\Delta LT, \Delta LTS, \Delta SDGs, \Delta LUP, \Delta TR - LUP\right) \quad (2.1)$$

As ΔLT, ΔLTS, ΔSDGs, and ΔLUP are concepts embedded in ΔTR-LUP, therefore:

$$\Delta QOL = f\left(\Delta TR - LUP\right) \quad (2.2)$$

where:

ΔQOL: change in quality of life,
ΔLT: change in land tenure