

# Introducing a QOL Provider-Receiver Model for Assessing Disciplinary Contributions to Quality of Life: A Civil Engineering Perspective

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**Abstract:** This study introduces a novel framework—the Quality of Life (QOL) Provider-Receiver Model—to explore and assess how academic disciplines and professions contribute to individual and community well-being. Rather than attempting to measure QOL directly, which is inherently complex and influenced by subjective and objective factors, the model emphasizes evaluating the contributions of stakeholders—particularly professionals—to various QOL domains. Grounded in established QOL theories and supported by multidimensional frameworks such as the WHOQOL, the model identifies three interconnected elements—objective life conditions, subjective well-being, and personal values—as key determinants of perceived quality of life. The model is applied to the field of civil engineering, demonstrating how five core facets—Infrastructure Development, Water Supply and Sanitation, Disaster Resilience, Environmental Sustainability, and Climate Change Adaptation—align with and impact specific QOL domains. This conceptual approach offers a foundation for developing assessment tools, such as checklists or surveys, to evaluate how professional practices enhance quality of life across diverse contexts.

**Key Words:** Quality of Life, QOL, Civil Engineering

## 1. INTRODUCTION

Quality of Life (QOL), as defined by the World Health Organization ((WHOQOL 1998), refers to “an individual’s perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.” Expanding on this definition, QOL is a comprehensive concept that encompasses the overall well-being of individuals and communities, incorporating physical, mental, emotional, and social dimensions. It is influenced by a wide range of factors, including health, education, income, the environment, safety, relationships, cultural enrichment, and access to resources and opportunities. Described below and shown in Figure 1 are the six domains of quality of life based on QOL

studies (Felce and Perry 1995, Ruzevicius et al. 2007).

- 1) **Physical well-being** focuses on aspects related to the health and safety of individuals or communities, encompassing factors such as physical health, safety, and access to healthcare.
- 2) **Material well-being** pertains to living conditions, including income, housing, privacy, food security, transportation, and overall personal or community security.
- 3) **Social well-being** emphasizes the quality of interpersonal relationships within families and friendships, as well as broader interactions and engagement within the community.
- 4) **Development and activity** relates to factors that contribute to the personal or communal growth, such as competence, independence,

and participation in functional activities like work, leisure, and education.

- 5) **Emotional well-being** includes self-esteem, a sense of status or respect, and spiritual or religious faith, all of which contribute to an individual's sense of fulfillment and stability.
- 6) **Environmental well-being** - Although not explicitly part of Felce and Perry's domains, environmental well-being can be seen as an implicit aspect of quality of life today. This domain refers to the quality of the natural and built environment in supporting human health, safety, and overall life satisfaction. It encompasses the conditions of air, water, soil, ecosystems, and the sustainability of urban and rural spaces.

Assessment instruments are designed to evaluate the quality of life (QOL) of individuals and communities. These instruments typically contain specific questions that assess various QOL domains, using quantitative and qualitative metrics that reflect an individual's subjective and objective perspectives, as well as their personal values. One notable example is the WHOQOL (1998), which consists of 100 assessment questions covering six QOL domains and specific facets related to quality of life. This questionnaire evaluates how individuals perceive their quality of life, health, and other personal aspects. A shorter version, the WHOQOL-BREF, comprises only 26 items but still provides a comprehensive assessment of QOL. Most QOL instruments are designed to measure the well-being of individuals or communities.

Assessment of QOL of an individual or even a community is complicated and dynamic because the various facets of the QOL domains are influenced and received or transferred to an individual or community based on the interaction of three key elements (Felce and Perry 1995):

- 1) **Objective Life Conditions** refer to tangible, external factors such as income, housing, healthcare, education, infrastructure, and environmental quality. These conditions provide the foundation for a stable and secure life. However, their impact on QOL is not absolute, as their influence varies

depending on how they are perceived and valued by an individual.

- 2) **Subjective Feelings of Well-being** represent an individual's emotional and psychological response to their life circumstances. Even if objective conditions are favorable, a person may feel dissatisfied if their expectations or personal values are unmet. Conversely, individuals in less privileged conditions may still report high well-being due to strong social connections, resilience, or a sense of purpose.
- 3) **Personal Values and Aspirations** shape how people interpret and prioritize their life conditions. Different individuals place varying levels of importance on material wealth, career success, relationships, or personal growth. A person's aspirations influence their satisfaction with their circumstances—those who achieve their goals tend to experience greater well-being, while unmet aspirations may lead to dissatisfaction.

The three elements influence each other in complex ways, ultimately determining an individual's overall well-being.

- Objective life conditions provide the baseline for well-being, but their impact is filtered through personal values and subjective perceptions.
- Subjective well-being is influenced by both tangible circumstances and the alignment of personal aspirations with reality.
- Personal values and aspirations guide how people evaluate their life conditions and overall satisfaction, affecting their emotional response to their environment.

For example, a well-designed, resilient community (objective condition) can enhance safety and comfort, fostering a sense of security (subjective well-being). However, if an individual prioritizes environmental sustainability (personal values), they may be more satisfied in a green, eco-friendly neighborhood, even if it lacks luxurious amenities. Another example given by Felce and Perry (1995): "For example, size of income (objective condition) may contribute little to quality of life for a person whose values are nonmaterialist (personal values), although

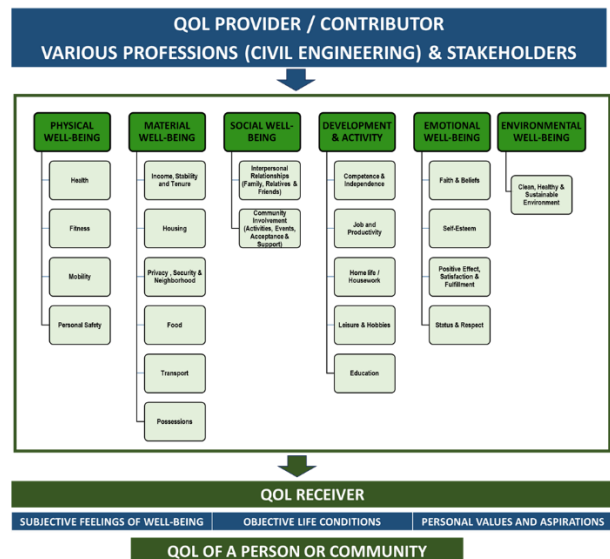
satisfaction with income (subjective well-being - e.g., enough to meet personal needs) might still carry a high weight.” Ultimately, balancing these three elements leads to a holistic understanding of QOL, emphasizing that well-being is not just about improving material conditions but also aligning experiences with personal values and aspirations.

Instead of measuring the QOL of an individual or community which is very complicated, this study aims to explore instead the appraisal of the contribution of the stakeholders to QOL. As a start, a QOL Contributor/Provider-Receiver Model is introduced in Figure 1. QOL is a multifaceted concept that varies in focus depending on the discipline and spatial level of analysis. The QOL Contributor/Provider which is introduced in the model represents the various institutions and stakeholders across multiple sectors that influence QOL.

One of the stakeholders that contribute to QOL are the professionals. The nature of the contribution of a profession to QOL depends on its discipline and specialization. Across various fields, QOL research highlights specific aspects of well-being, reflecting its diverse interpretations and applications. Many fields have incorporated QOL into their research, each emphasizing specific aspects of well-being. In sociology, QOL is assessed in terms of how societal structures and relationships influence the overall satisfaction and happiness of individuals within a community (Budayová et al., 2022). In economics, QOL is regarded as a measure of economic well-being and prosperity, taking into account factors such as income levels, employment opportunities, access to goods and services, economic stability, equality, and the quality of working life (Ruzevicius et al., 2007; Decyk & Rzeszutek, 2021; Hajduová et al., 2014). In medicine and health, QOL includes the capacity to perform daily activities, maintain physical and emotional health, and achieve overall life satisfaction (Haraldstad et al., 2019). Health-related QOL, in particular, evaluates the impact of diseases, medical treatments, and healthcare interventions on a patient’s overall well-being (Hollandsworth, 1988).

The QOL Contributor/Provider – Receiver Model may be useful tool in designing assessment procedures which can be a checklist, a survey or a list of questions that can be used to determine the

contribution of a discipline or a profession to QOL. Each profession or discipline has specialized outputs or products or services that can be aligned to various QOL facets and domains. This will be shown in the next section for the Civil Engineering (CE) profession.



**Figure 1. A QOL Contributor/Provider – Receiver Model**

## 2. CIVIL ENGINEERING AND QOL

QOL in the context of civil engineering involves enhancing community living standards through the strategic design, implementation, and maintenance of infrastructure and services. Recognizing the vital role and responsibility of civil engineers in improving QOL, efforts are underway to strengthen this focus. Globally, the impact of civil engineering on QOL is well-recognized. Hill (2024) emphasizes the pivotal role of civil engineering in enhancing QOL, stating, “*Civil engineering significantly enhances our quality of life by providing the infrastructure needed for everyday activities. Imagine a world without clean drinking water, reliable electricity, or safe transportation networks—these are all made possible by the work of civil engineers.*”

A blog post by the Institution of Civil Engineers (ICE, 2022) titled “6 Ways Civil Engineers Improve Our Lives” highlights specific contributions, including: (a) Providing clean water, (b) Connecting communities through transportation infrastructure, (c) Protecting the environment, (d) Mitigating flood risks, (e) Creating livable communities, and (f) Responding to emergencies.

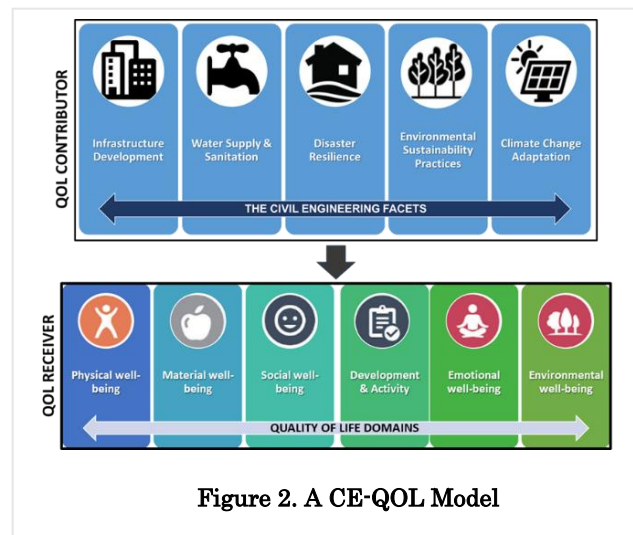
In the Philippines, the civil engineering community is advocating for the passage of Senate Bill 1467 and a corresponding House bill to enact a new Philippine Building Act. This proposed legislation aims to establish enhanced standards for building and construction, addressing critical QOL concerns such as: (a) Safeguarding lives and protecting people from injury, (b) Ensuring public health and well-being, (c) Protecting property from physical damage, (d) Minimizing disaster risks, (e) Promoting sustainability, and (f) Mitigating negative environmental, economic, and social impacts.

Civil engineering also directly addresses several of the United Nations Sustainable Development Goals (SDGs) by driving the development of infrastructure, managing natural and built resources, and advancing sustainable practices. As noted by Oreta (2024a), civil engineering plays a critical role in promoting these goals, further cementing its relevance to societal well-being and global development. Refer to Appendix A.

Hence, a CE-QOL framework consisting of five key facets of civil engineering (Oreta 2024b) that significantly contribute to QOL is conceptualized as shown in Figure 2. Each CE facet plays a crucial role in shaping different aspects of QOL, ensuring that physical, material, social, developmental, emotional, and environmental dimensions are well-supported.

Using the QOL Contributor/Provider – Receiver Model, the five CE facets below can be aligned to the QOL domains. Here’s how the five

civil engineering (CE) facets align with the Quality of Life (QOL) domains and why they are interconnected:



**Figure 2. A CE-QOL Model**

- 1) **Infrastructure Development** → Material Well-being, Development & Activity. *Why?* Infrastructure development directly impacts material well-being by improving housing, transportation, and economic opportunities. It also supports development and activity by enabling employment, mobility, and access to education, recreation, and essential services.
- 2) **Water Supply and Sanitation** → Physical Well-being, Environmental Well-being. *Why?* Clean water and proper sanitation systems are fundamental to physical well-being, as they prevent diseases and promote hygiene. Additionally, sustainable water management enhances environmental well-being by protecting natural water sources and ensuring responsible consumption.
- 3) **Disaster Resilience** → Physical Well-being, Material Well-being, Social Well-being. *Why?* Disaster-resilient structures ensure physical well-being by safeguarding lives and reducing injuries. They contribute to material well-being

by protecting homes, businesses, and infrastructure from damage. Strengthening communities against disasters also enhances social well-being, as people feel safer and more secure in their environments.

- 4) **Environmental Sustainability** → Environmental Well-being, Emotional Well-being. *Why?* Embedding eco-friendly practices in construction preserves ecosystems, reduces pollution, and mitigates climate change, directly benefiting environmental well-being. Additionally, living in a sustainable, green environment fosters a sense of responsibility and stability, contributing to emotional well-being.
- 5) **Climate Change Adaptation** → Environmental Well-being, Physical Well-being, Development & Activity. *Why?* Climate-resilient urban planning ensures environmental well-being by reducing environmental degradation and improving sustainability. It also supports physical well-being by mitigating climate-related health risks (e.g., heatwaves, flooding). Moreover, adaptation strategies encourage smart growth and sustainable development, enhancing development and activity by enabling functional, future-proof cities.

Having developed the CE-QOL relationship, the contribution of each CE facet to the various QOL domains can be determined by identifying both quantifiable and qualitative indicators related to civil engineering that have an impact to the QOL domains. A checklist can be designed, and an assessment tool can be developed to appraise the important contribution of the profession to an individual or community's well being and quality of life.

Shown in Table 1 is a sample checklist using the Lickert scale (1 to 5) that was used in a survey (Oreta, Galupino, and Uy 2025) to assess the awareness of civil engineering students on the contribution of of the discipline to the community's well being and QOL.

**Table 1. A CE-QOL Awareness Checklist**

CE Facet	Student Survey Questions
<b>1. Infrastructure Development</b>	<i>1.1 I understand how civil engineering contributes to the design and construction of safe and sustainable housing.</i>
	<i>1.2 I have learned about the role of civil engineering in the development of resilient public infrastructure to enhance transportation and mobility (e.g., roads, bridges, railways).</i>
	<i>1.3 I have learned strategies to develop smart cities and thus enhancing the quality of the built environment.</i>
<b>2. Water Supply &amp; Sanitation</b>	<i>2.1 I can explain how civil engineering ensures access to clean water and effective sanitation systems.</i>
	<i>2.2 I have learned the importance of wastewater treatment and its impact on public health and the environment.</i>
	<i>2.3 I have learned effective strategies how to effectively utilize rain and flood water for the benefit of the community.</i>
<b>3. Disaster Resilience</b>	<i>3.1 I understand how civil engineering designs structures to withstand natural disasters (e.g., earthquakes, floods).</i>
	<i>3.2 I know how to analyze and design structures (e.g. buildings, bridges) to assure safety and serviceability based on design codes and standards.</i>
	<i>3.3 I have learned how civil engineers contribute to disaster recovery and rebuilding efforts in affected communities.</i>
<b>4. Sustainable Practices</b>	<i>4.1 I understand that civil engineers have a responsibility to incorporate sustainability in their designs to improve community health and well-being.</i>
	<i>4.2 I have learned how civil engineers integrate eco-friendly materials and practices into construction projects.</i>
	<i>4.3 I understand how sustainable infrastructure can mitigate environmental impacts and reduce carbon footprints.</i>
<b>5. Climate Change Adaptation</b>	<i>5.1 I am aware of how civil engineering helps communities adapt to climate change through resilient infrastructure design.</i>
	<i>5.2 I have studied the role of civil engineering in reducing environmental degradation through sustainable practices.</i>
	<i>5.3 I understand the concept of green building practices and their impact on climate change.</i>

#### 4. CONCLUSIONS

This study presents the Quality of Life (QOL) Provider-Receiver Model as a conceptual tool for assessing a profession's or discipline's contribution to quality of life, with a particular focus on civil engineering. By framing professions as QOL providers and aligning their outputs with specific QOL domains, the model offers a practical and insightful approach to understanding how professional practice enhances individual and community well-being. Civil engineering, as demonstrated, plays a critical role in shaping multiple facets of QOL through its impact on infrastructure, safety, environmental sustainability, and resilience. While this work is exploratory, it sets the stage for the development of discipline-based QOL assessment tools, which can be instrumental in guiding both educational outcomes and professional responsibilities. Future research can expand the model's application to other disciplines, further reinforcing the broader societal impact of academic and professional practice on quality of life.

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**Appendix A: CIVIL ENGINEERING AND THE UN SUSTAINABLE DEVELOPMENT GOALS (Oreta, A. 2024a)**

<b>SDG</b>	<b>Degree</b>	<b>Importance of Civil Engineering Contribution</b>
<b>SDG 3: Good Health and Well-Being</b>	High	<i>Civil engineering is essential for public health and safety through infrastructure such as hospitals, clean water systems, proper sanitation, and disaster-resilient building that supports healthcare and well-being.</i>
<b>SDG 4: Quality Education</b>	Moderate	<i>While not the primary focus, civil engineering significantly contributes by enabling access to quality education through infrastructure such as schools, universities, and research facilities.</i>
<b>SDG 6: Clean Water and Sanitation</b>	High	<i>Civil engineering through infrastructures such as water supply systems, sewage treatment plants, and sanitation facilities provides the supply of clean water access and sanitation solutions.</i>
<b>SDG 7: Affordable and Clean Energy</b>	High	<i>Civil engineers design and construct renewable energy facilities such as solar farms, wind farms, and hydropower plants.</i>
<b>SDG 8: Decent Work and Economic Growth</b>	Moderate	<i>Civil engineering indirectly supports this goal by driving economic growth through infrastructure that supports businesses and industries and providing employment during construction.</i>
<b>SDG 9: Industry, Innovation, and Infrastructure</b>	High	<i>Infrastructure development is at the core of civil engineering through infrastructures designed and built by civil engineers like roads, bridges, railways, buildings, and industrial facilities.</i>
<b>SDG 11: Sustainable Cities and Communities</b>	High	<i>Civil engineers contribute to urban planning, transportation systems, affordable housing, waste management, and disaster-resilient infrastructure creating sustainable and livable urban environments for current and future generations.</i>
<b>SDG 12: Responsible Consumption and Production</b>	Moderate	<i>Sustainable construction practices, recycling materials, and reducing waste are essential to civil engineering's contribution to this goal.</i>
<b>SDG 13: Climate Action</b>	High	<i>Civil engineers design climate-resilient infrastructure and integrate low-carbon technologies in construction. They also contribute to flood management, renewable energy systems, and sustainable urban planning.</i>
<b>SDG 14: Life Below Water</b>	Moderate	<i>Coastal and marine engineers design sustainable harbors, manage coastal erosion, and mitigate pollution to protect marine ecosystems.</i>
<b>SDG 15: Life on Land</b>	Moderate	<i>Civil engineers implement sustainable land-use practices and minimize environmental degradation during infrastructure development</i>