

# Institutional Research Themes Framework



Tshwane University  
of Technology

*We empower people*

## 2025



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## 1. Background

The global higher education landscape has increasingly embraced the United Nations (UN) Sustainable Development Goals (SDGs) as a guiding framework for institutional transformation, research focus and societal impact. Universities are not only centres of knowledge production, but also play a pivotal role in addressing the world's most pressing challenges, from poverty and inequality to climate change and technological advancement.

The Tshwane University of Technology (TUT), as a progressive university of technology, has adopted the SDGs as a compass for shaping its research, innovation, and engagement agenda. Aligned with the national priorities of South Africa that are outlined in the National Development Plan (NDP, 2030) and continental imperatives such as the African Union (AU) Agenda 2063, TUT recognises the critical importance of aligning its research outputs with sustainable development frameworks to ensure relevance, impact and global visibility.

## 2. Introduction

This framework provides a thorough examination of TUT's research outputs in alignment with the 17 SDGs. It elucidates key competencies, thematic research areas and potential pathways for strategic development, reflecting the institution's dedication to evidence-based planning, global benchmarking, and research with tangible impact. The framework showcases the alignment between TUT's specialised research areas and the SDGs, guiding institutional planning, informing policy direction, and fostering strategic partnerships. Additionally, the framework aims to equip the University for engagement in global impact assessment, such as the Times Higher Education Impact Rankings.

The framework further highlights the University's contribution towards achieving both national and international sustainable development objectives. It articulates how TUT's academic pursuits and research address urgent global development challenges. By doing so, it lays the groundwork for improving collaboration across various disciplines, encourages the development of innovation ecosystems, and supports initiatives that have a positive impact in the community.

## 3. Aim of the Framework

The framework aims to align TUT's research with the SDGs, thereby enhancing societal impact, guiding resource allocation, and promoting interdisciplinary collaboration. Table 1 provides an overview of the aim of the framework, and it is aligned with strategic intents.

**Table 1: Strategic Aim of the Framework**

OBJECTIVE	STRATEGIC INTENT
a) Establish the alignment of TUT research activities to the United Nations SDGs	To ensure that institutional research is globally relevant, socially responsive, and aligned with international development frameworks such as the 2030 Agenda.
b) Identify the SDGs in which TUT is more actively involved in research	To map institutional research strengths and focus areas, highlighting where TUT contributes most significantly to sustainable development through knowledge production.
a) Develop university-focused research themes aligned to the SDGs	<p>To create a strategic research framework that will:</p> <ul style="list-style-type: none"> <li>• Guide research activities and inform resource allocation.</li> <li>• Foster interdisciplinary collaboration across departments, faculties and research platforms.</li> <li>• Enhance the University's ability to address societal challenges, attract funding and partnerships, and increase national and international impact.</li> </ul>

## 4. Methodology

The framework assessed the correlation between research topics at TUT, primarily focusing on Master's and Doctoral research areas, as validated by the Faculty Committee for Postgraduate Studies (FCPS). In addition to this analysis, an examination of publications recorded in Clarivate Converis for 2023, which received approval from the Department of Higher Education and Training (DHET), was conducted to evaluate their alignment with the SDGs.

Subsequently, an exploratory exercise was performed to identify the specific SDGs with which TUT is most actively engaged, employing a structured methodology that incorporated several critical steps.

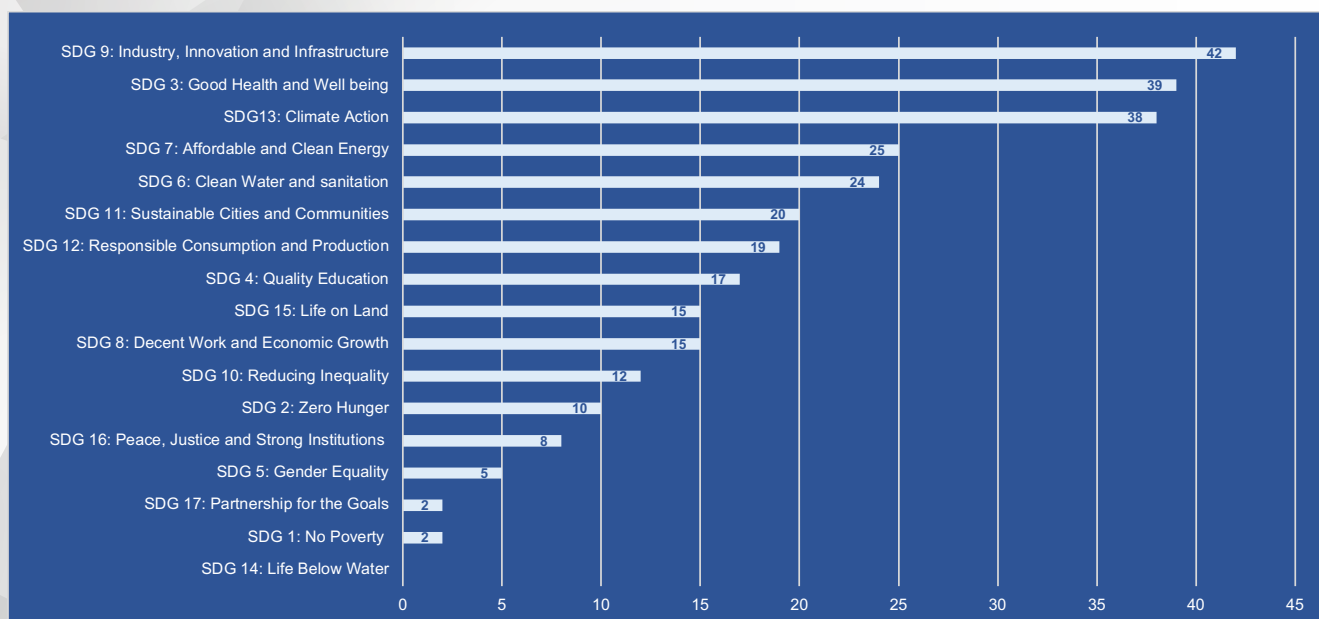
### 4.1 Data Collection, Classification and Analysis

- Data Gathering:** Comprehensive data on research projects was systematically collected from each faculty.
- Alignment of Faculty Research to SDGs:** An extensive examination was undertaken to determine which SDGs most closely align with most research activities at TUT.
- Mapping Initiatives:** Each research project or initiative was mapped to the corresponding SDGs based on its objectives and focus. Notably, some projects address interdisciplinary topics, leading to alignment with multiple SDGs.
- Identification of Themes:** Key overarching research themes that emerged during the analysis were systematically identified.

## 5. Results

Figure 1 illustrates the distribution of research topics corresponding to the SDGs. Notably, SDG 9 (Industry, Innovation and Infrastructure) exhibits the highest engagement, encompassing 42 associated projects. This is closely followed by SDG 3 (Good Health and Well-being), which includes 39 projects, and SDG 13 (Climate Action) with 38 projects.

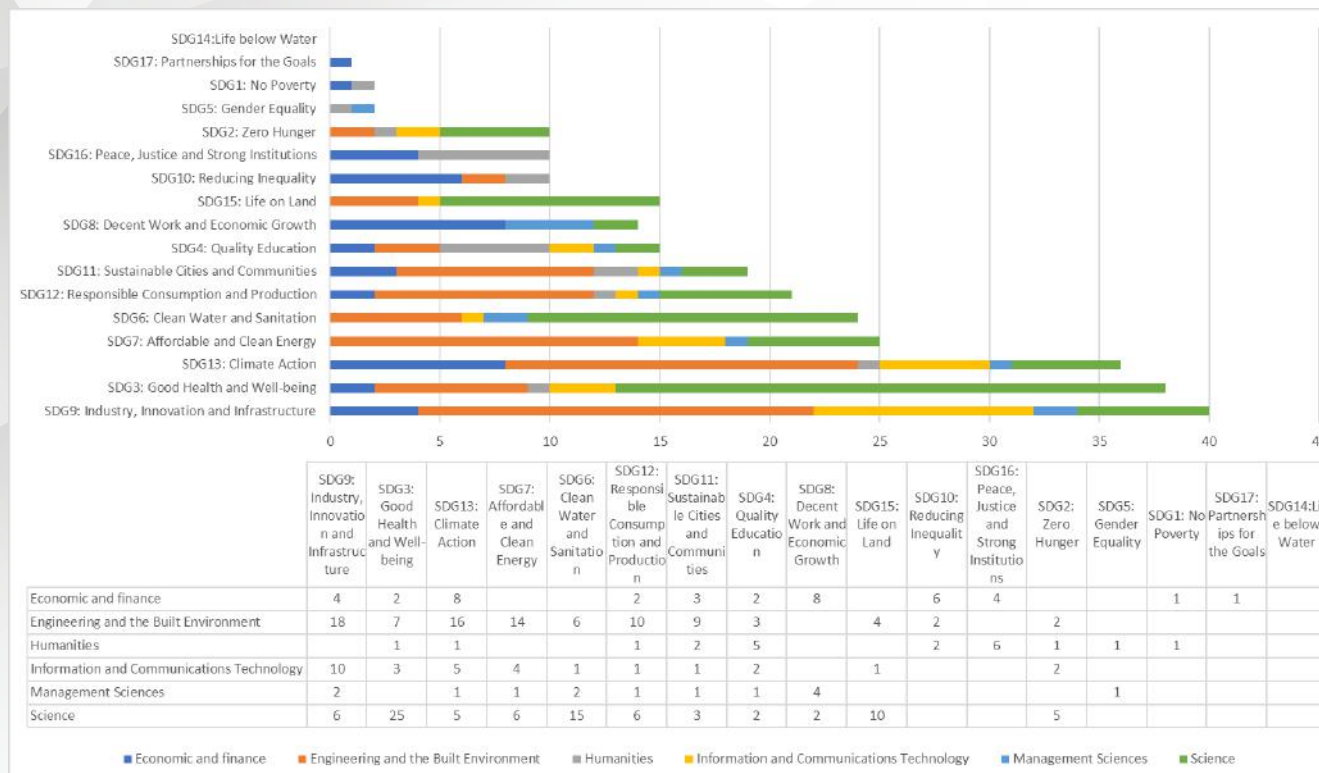
Figure 1: Number of Research Topics per SDG



## 5.1. Faculty Contributions

Figure 2 outlines the distribution of research and/or projects aligned with various SDGs across different faculties. According to the results, the Faculty of Engineering and the Built Environment (FEBE) contributes the most towards projects (88) that align with multiple SDGs, with a significant focus on SDG 9 (Industry, Innovation and Infrastructure) and SDG 7 (Affordable and Clean Energy). The Faculties of Science; and Economics and Finance also contribute significantly, with 85 and 43 projects, respectively. The Science faculty shows a strong alignment with SDG 3 (Good Health and Well-being) and SDG 6 (Clean Water and Sanitation).

Figure 2: Faculty Research Contributions Linked to SDGs



## 5.2. SDG Diversity and Faculty Alignment

The following diversity and faculty alignment on the SDGs was recorded:

- FEBE is engaged in 18 projects. In comparison, the Faculty of Information and Communication Technology (ICT) participates in 10 projects, reflecting a significant emphasis on technological and engineering solutions.
- The Faculty of Science shows significant representation of 25 projects, emphasising health-related research.
- SDG 13 receives substantial contributions from the Faculty of Economics and Finance (eight projects) and FEBE (16 projects), highlighting efforts in finance, economics and engineering to promote climate resilience. The Faculty of Science contributes to 13 SDGs, with a strong representation in health, climate action and clean water.
- SDG 7 is primarily driven by FEBE (14 projects), showing a focus on energy research in engineering. FEBE covers 10 SDGs, with a predominant focus on innovation, energy and sustainable cities.
- Economics and Finance addresses six SDGs, primarily focusing on SDG 8, which includes economic growth, climate action and the reduction of inequalities.
- The Faculty of Arts and Design, along with the Faculty of Humanities, has fewer projects, concentrating on specific SDGs such as reducing inequalities (SDG 10) and ensuring quality education (SDG 4).



## 6. TUT Research Outputs Alignment to the SDGs

The framework utilised data imported from Clarivate Converis to map the alignment of all TUT's publications with the SDGs. The results of this analysis are included to evaluate the correlations with the findings of this framework, specifically the alignment between the publication and the research topic, and the alignment to the SDGs. To enhance alignment with SDGs without undermining their significance, it is essential to cross-reference findings with the NDP and the AU Agenda 2063. Both sets of findings reveal that:

- SDGs 9, 7 and 3 rank among the top three SDGs in which TUT is actively engaged, according to both reports.
- The fourth position is occupied by SDG 12 and SDG 13 in the context of publications and research topics, respectively, while SDG 6 ranks as the fifth inclusion.
- The examination of publications indicates alignment with SDG 14, whereas the research topics did not yield any corresponding indicators.



**Tables 2 and 3: TUT Research Outputs and Related SDGs:**

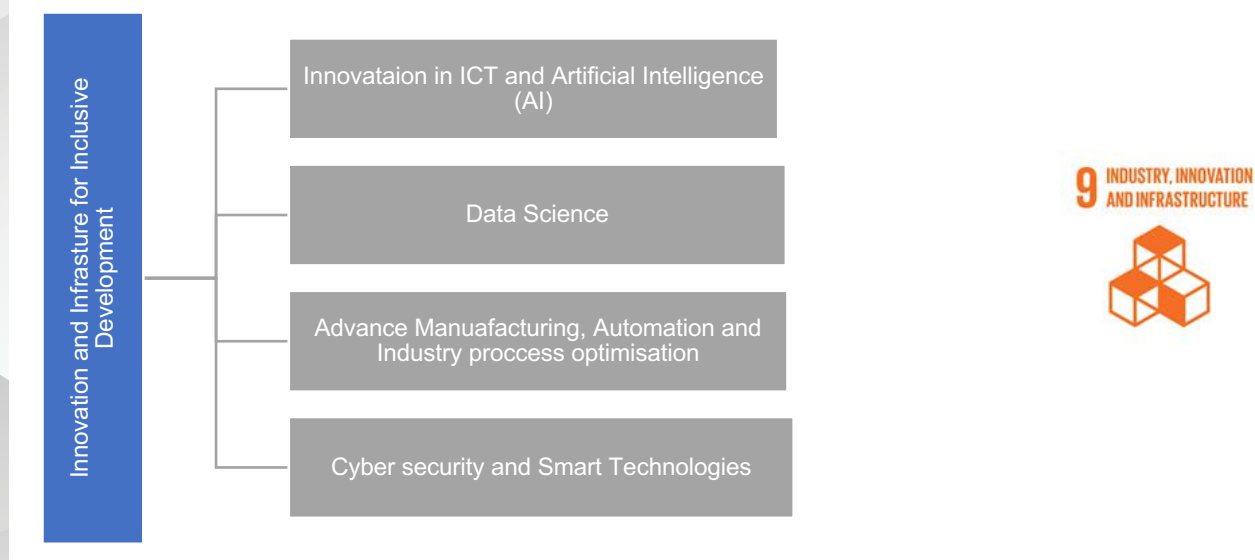
Name	Web of Science Documents	Times Cited	% Docs Cited	SDGs	TOTAL
03 Good Health and Well-being	146	229	52.74	SDG9: Industry, Innovation and Infrastructure	42
07 Affordable and Clean Energy	35	101	65.71	SDG3: Good Health and Well-being	39
09 Industry, Innovation and Infrastructure	33	40	33.33	SDG13: Climate Action	38
12 Responsible Consumption and Production	30	38	50.0	SDG7: Affordable and Clean Energy	25
06 Clean Water and Sanitation	30	35	46.67	SDG6: Clean Water and Sanitation	24
11 Sustainable Cities and Communities	31	34	41.94	SDG12: Responsible Consumption and Production	21
02 Zero Hunger	23	23	39.13	SDG11: Sustainable Cities and Communities	20
13 Climate Action	32	22	21.88	SDG4: Quality Education	17
14 Life Below Water	22	17	31.82	SDG8: Decent Work and Economic Growth	15
04 Quality Education	23	18	34.78	SDG15: Life on Land	15
15 Life on Land	22	13	27.27	SDG10: Reducing Inequality	14
17 Partnerships for the Goals	11	6	27.27	SDG16: Peace, Justice and Strong Institutions	11
01 No Poverty	10	0	0.0	SDG2: Zero Hunger	10
05 Gender Equality	13	0	0.0	SDG5: Gender Equality	5
08 Decent Work and Economic Growth	6	0	0.0	SDG1: No Poverty	2
10 Reduced Inequality	6	0	0.0	SDG17: Partnerships for the Goals	2
				SDG14: Life Below Water	0
				<b>TOTALS</b>	<b>299</b>

## 7. Research Themes

The institutional research priorities are categorised into themes to enhance focus on interconnected goals. The following are groupings of SDGs and corresponding themes:

### 7.1. Theme One: Innovation and Infrastructure for Inclusive Development

The theme encompasses the objectives of SDG 9, emphasising sustainable infrastructure development, inclusive industrialisation and innovation that benefits all sectors of society:

**Figure 3: Theme One: Innovation and Infrastructure for Inclusive Development**


## 7.2. Theme Two: Energy, Climate and Environmental Sustainability

The theme centres on developing renewable energy sources, enhancing energy efficiency, promoting sustainable consumption, and tackling climate change to minimise environmental impact. This theme encompasses sustainable energy solutions, with a particular focus on the following SDGs:

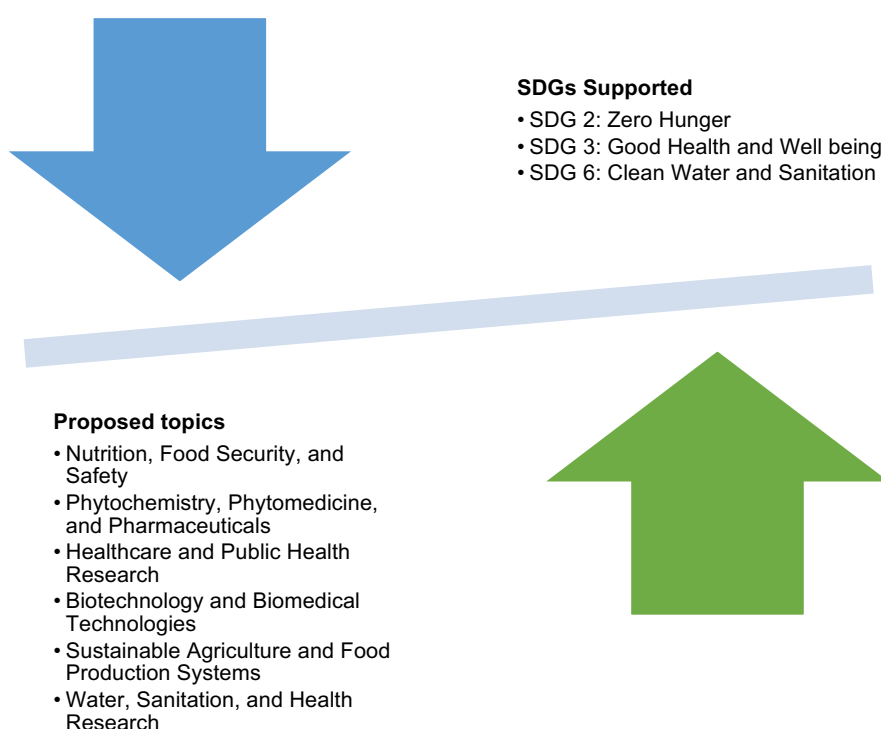
**Figure 4:** Theme Two: Energy, Climate and Environmental Sustainability



## 7.3. Theme Three: Health, Nutrition and Sanitation for Sustainable Development

The theme emphasises enhancing health outcomes, access to clean water and sanitation and ensuring nutritional security to support well-being and community health.

**Figure 5:** Theme Three: Health, Nutrition and Sanitation for Sustainable Development

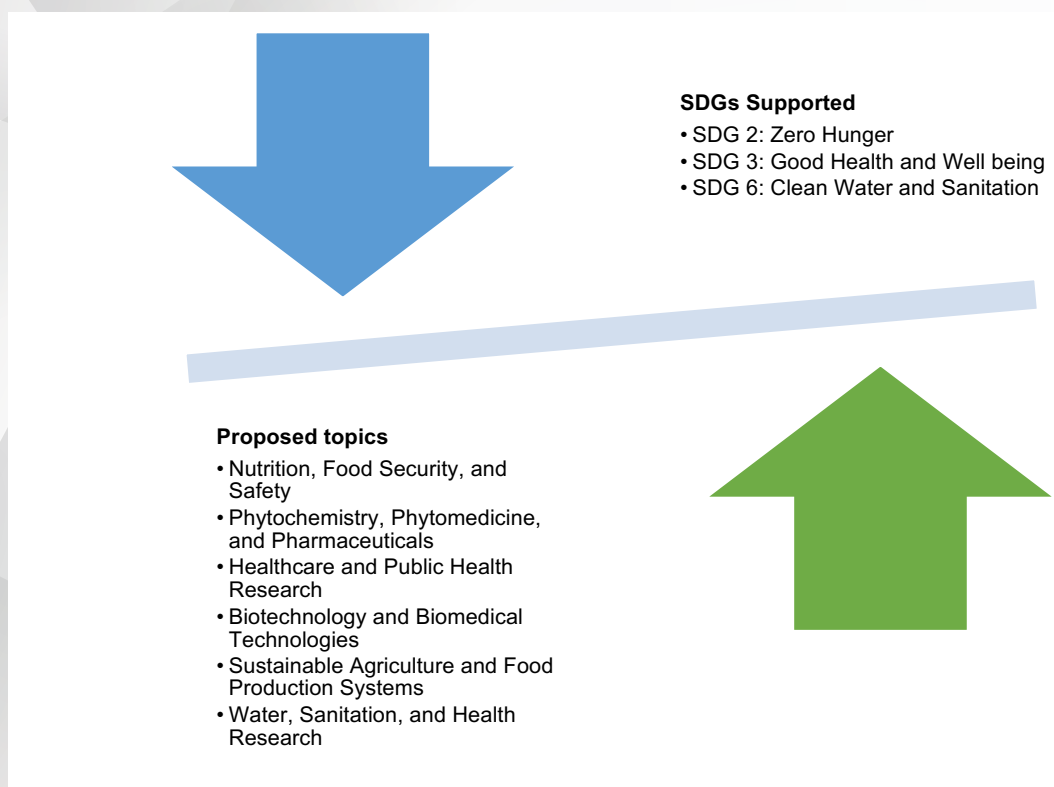


## 7.4. Theme Four: Education and Inclusive Growth

The theme focuses on accessible, high-quality education, supporting decent work and promoting inclusive economic growth.



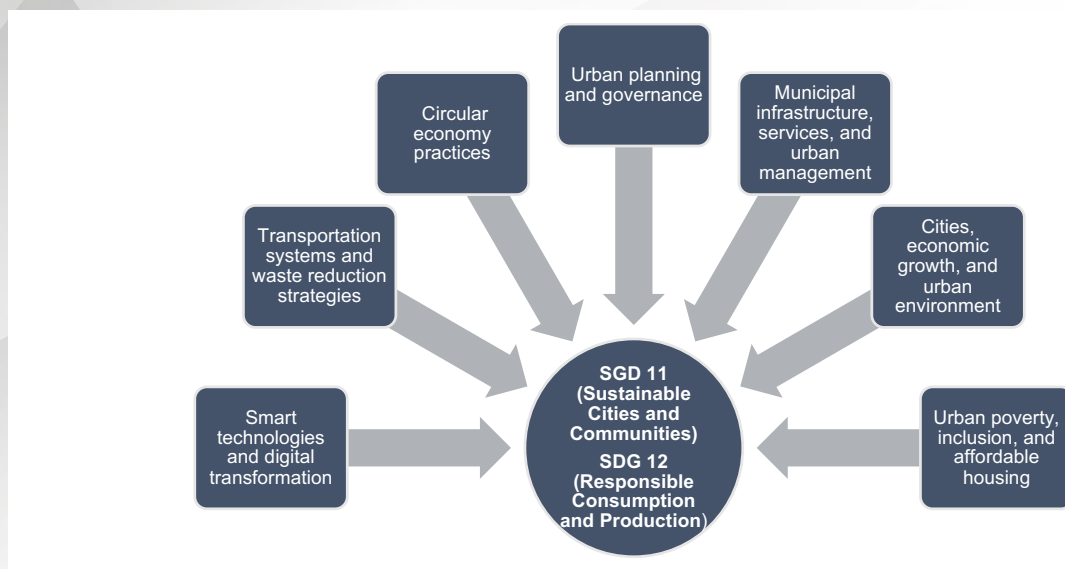
**Figure 6:** Theme Four: Education and Inclusive Growth



### 7.5. Theme Five: Urban Development and Resource Management

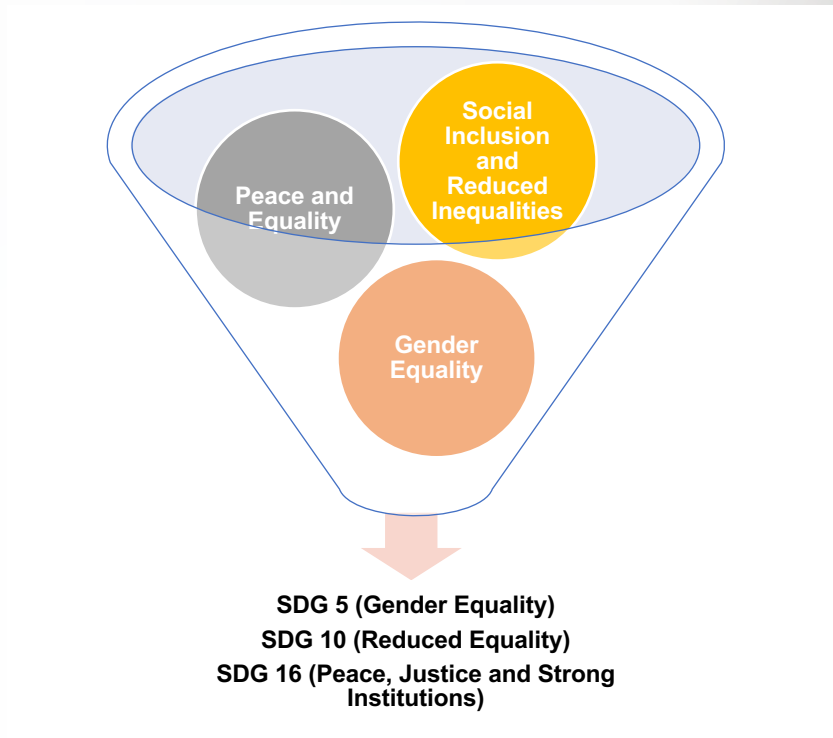
The theme promotes sustainable urban planning, green infrastructure, eco-friendly transportation, resource efficiency and waste reduction. It aims to enhance community resilience and conservative resources per sustainable consumption principles.

**Figure 7:** Theme Five: Urban Development and Resource Management



### 8.6. Theme Six: Equality, Peace and Inclusive Societies

The theme aims to promote social inclusion, gender equality and the reduction of inequalities. It underscores the importance of fostering equitable opportunities and practices among diverse societal groups, while bolstering peace and strong institutions to create fair and inclusive societies.

**Figure 8:** Theme Six: Equality, Peace and Inclusive Societies

## 8. Conclusion

The framework emphasises the significant alignment between TUT's research themes and the SDGs. It provides a comprehensive overview of the University's dedication to fostering sustainable development through various research initiatives. Additionally, the framework delineates six critical themes specifically crafted to guide TUT's research agenda. These themes aim to tackle pressing global challenges while making meaningful contributions to the evolution of sustainable societies.



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