Journal of Sustainability Perspectives

journal homepage: https://ejournal2.undip.ac.id/index.php/jsp/

Interacting The Urban Masterplan of Unicamp with the Sustainable Development Goals

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Article Info

Received:
15 March 2021
Accepted:
25 May 2021
Published:
1 August 2021

DOI:

Presented in The 6th International (Virtual) Workshop on UI GreenMetric World University Rankings (IWGM 2020)

Abstract Universities are the training centers for future decision-makers in the social, political and economic sectors. Considering the university campus as an urban locus or even a microcosm of society, the change that begins in the urban planning of a university is an opportunity for example and replication in the city. This paper presents the development of the Unicamp Urban Masterplan, a strategic project of the university that involves the participation of all-around social actors: professors, students, researches, staff and local community and brings the actual panorama, the future scenarios and the guidelines to achieve them. It is organized through six planning areas: 1. Urban usage and heritage; 2. Environment; 3. Urban infrastructure; 4. Mobility and accessibility; 5. Social interaction; and 6. University and society. Projects resulting from these guidelines should be developed through living laboratories. Campus territories and their evolution are monitored through performance indicators aligned with the UI GreenMetric sustainable university ranking process indicators. This paper explains the methodology in which the urban projects be implemented through living laboratories to put into practice the SDGs, as necessary action for the transition to sustainability in the campuses. The use of the university campuses as a living laboratory results in the transformation of the Unicamp space and impel the replication to transform the local community to sustainability and to disseminate solutions to the cities and other universities.

Keyword:

Sustainable campus, SDG, Sustainable Masterplan, Urban Sustainability.

1. Introduction

Universities, as spaces for the production of knowledge, are training centers for future professionals who make social, political, economic and environmental decisions, which can be based on sustainable development [1]. The application of sustainability in the facilities of its campuses is a way to include the production of knowledge and technologies by promoting the culture of sustainable development. Considering university campuses as an

urban locus or even a microcosm of society, the change that begins in the urban planning of a university is an opportunity for replication in a city [2; 3; 4 and 5).

Although concerns about the organization of urban spaces arose in cities, specifically in industrial cities [6], when university campuses are understood as extensions of their cities and holders of the institutional character of land use and occupation, the elaboration of a specific urban planning is necessary.

The State University of Campinas - Unicamp -, as a social agent, adopts the sustainable scenario of a development model and is developing the Integrated Masterplan [7], urban planning that includes sustainability in its daily life. The objective of the plan is to integrate the management of Unicamp as a sustainable university to the use and occupation of the territory. This integration is based on meeting the Sustainable Development Goals and involves the participation of all social actors at the university and its surroundings.

The Integrated PD, as a management instrument that establishes principles, guidelines and norms for territorial development, indicates guidelines aimed at sustainability, considering the vocations of the already urbanized areas of Unicamp and defining the vocations of the new areas, in line with the SDGs. The elaboration of the Integrated PD occurs with the collaboration of the university community through workshops to build the current panorama; the desired future scenarios; the guidelines and projects to achieve them and the indicators responsible for monitoring these scenarios.

The objective of this chapter is to report on the development process of Unicamp's Integrated Master Plan, its methodology, the involvement of the academic community, the guidelines and urban projects related to the plan, as well as the indicators used for management and monitoring. Unicamp, as a case study for the implementation of an urban master plan for a sustainable university, can represent a model to be followed by other Brazilian universities that are looking for sustainability on their campuses.

2. Sustainability applied at university campus

2.1. Urban Sustainability

In 2015, the same year that Rio + 20's sustainable development goals came into effect, a new meeting of world leaders took place in New York, the Sustainable Development Summit. At this meeting, a new agenda was defined, to finalize the work of the Millennium Development Goals and launch the new 17 Sustainable Development Goals (SDGs) in the document “Agenda 2030” [8], indicated in the Figure 4. The 2015 Millennium Sustainable Development Goals Report indicated that the MDGs were successful around the world, but deficiencies still existed [9] and, in order to address them at different levels, the SDGs were created.

The Habitat-III Conference, which took place in Quito, in October 2016, declares the right to the city as a human right and establishes a New Urban Agenda - NUA, which presents essential elements for the creation of a sustainable urban development pattern for a new model of urban development. Its territory would comprise urban, peri-urban and rural areas, and equality would be integrated into the issue of social justice. There is also the recognition of culture in the empowerment of sustainable development by citizens, contributing to the creation of new patterns of sustainable production and consumption and responsible use of resources [10].

Habitat-III adopted the importance of urban planning and design to define a provision of common goods, including streets and open spaces, efficient pattern of buildings, and created a theme in the NUA called “Sustainable and inclusive urban prosperity and

opportunities for all". This theme includes the instruments of compactness and density, polycentrism and mixed uses to promote economies of scale and agglomeration, strengthen food system, resource efficiency, urban resilience and environmental sustainability [10]. The SDG are fully adopted in NUA, specially the SDG 11, to make cities and human settlements inclusive, safe, resilient and sustainable [10]. The SDG 11 – Sustainable Cities and Communities – emphasize the urbanization and recognized the interconnection with other goals.

The history of international meetings and goals on sustainable urban development began with a strictly environmental concern: atmospheric pollution and environmental degradation. Currently, it has a huge variety of related themes that use the economy, including social, cultural and infrastructure issues. The urban has the potential to create sustainable societies, because it is involved in the integration of economic, ecological, political and cultural issues. Therefore, the implementation of planning, design and actions for urban sustainability is becoming increasingly urgent.

2.2. Sustainability at Unicamp

Unicamp is looking for sustainability on its campuses. Officially, in the 2000s, the first meetings began on the need to create an environmental policy, which, at first, was represented by the Waste Management Group, with the General Coordination of Unicamp. The Environmental Policy for Unicamp was institutionalized in November 2010, with the commitment to achieve environmental quality and develop activities aimed at the conservation of natural resources, the solution of negative impacts and the well-being of the community.

In 2014, as an evolution of the Environmental Policy, Unicamp created the Sustainable University Management System to develop a Sustainable University Policy, which culminated in the creation of the Sustainable University Management Group (GGUS). The GGUS's mission is to build, develop and implement policies, guidelines and patterns for Unicamp, based on continuous improvement and environmental, economic and social performance. The GGUS guides specific technical groups for the management of water, energy, fauna and flora, environmental education, smart campus and waste of the Unicamp campuses.

Since 2017, Unicamp is developing the Integrated Masterplan: a strategic project of the university that involves the participation of all-around social actors - professors, students, researches, staff and local community - and brings the actual panorama, the future scenarios and the guidelines to achieve them. The Integrated Master Plan recognizes Unicamp's role in the development of technologies, strategies, citizens and leaders necessary for sustainability. Thus, it implements the International Sustainable Campus Network principles, sets goals and publishes the performance of its actions on a regular basis. In this sense, the survey and assessment of Unicamp's current situation regarding sustainability is characterized as an instrument of management and continuous improvement in the transition to a sustainable university.

One of the instruments for assessing the sustainability of universities is ranking. It collects sustainability indicators integrated into a document for evaluation. This process involves the participation of different sectors of the university: infrastructure, water, energy, climate change, waste, transportation, education, research and social relations. The analysis of the current ranking systems indicated that the STARS ranking systems, from The Association for the Advancement of Sustainability in High Education, and Universitas

Indonesia GreenMetric have the most targeted indicators for Latin American universities. In order to include Unicamp in these ranking systems, starting with the UI GreenMetric, the Integrated Master Plan coordinated a Work Group to gather the sustainability indicators of campuses in its six categories: settings and infrastructure; energy and climate change; waste; water; transportation and education and research.

2.3. Unicamp Living Labs

The Integrated Masterplan of Unicamp proposes that urban projects resulting from its demands are designed and developed through living laboratories, with the objective of putting the sustainable urban guidelines into practice, as necessary measures for the transition to sustainability on campuses. Living laboratories are physical and institutional spaces for collaborative processes that act on complex social and technological challenges of sustainable development [1].

In living laboratories, there may be public-private partnerships in which companies, public authorities and the local community create solutions through innovation, experiment, validate them; develop prototypes and present them to the market. This is a co-creative process that allows effective integration between research and innovation in a specific physical space with the collaboration of technical and academic professionals and users of the space.

The use of university campuses as living laboratories presents itself as a niche for the transition to sustainability and its strengthening and prosperity result in the transformation of Unicamp's space and drive the replication of its results. The main objective of implementing urban planning projects as living laboratories at Unicamp is to transform the local community for sustainability and, through its consolidation, influence and disseminate solutions beyond campuses, in order to expand them.

3. Integrated Masterplan of Unicamp

The University of Campinas was founded in October 1966, with the mission of creating and disseminating knowledge in its fields of knowledge. Currently, it is structured in six campuses, with 2103 active professors, 7471 active employees, 66 undergraduate courses, 159 postgraduate courses and 37927 students enrolled, among undergraduate and graduate students. Unicamp also has 36 technical high school courses [11].

Unicamp recognizes its importance as a public university in the training of professionals capable of solving the challenges of contemporary society. Among them, sustainable development is the priority and what makes it possible to reach all the others. In this sense, it turned to aligning itself with the global sustainability scenario and committed to achieving the SDGs established in the United Nations 2030 Agenda. This alignment, added to the structural complexity of the university, led to the creation of the Integrated Masterplan.

Started in 2017, the Integrated Masterplan works with the university's urban planning, recognizing the dynamics and complexity of the occupied territory, with the aim of responding to problems and establishing control mechanisms over territorial development in the most sustainable way possible. Its mission is integrating the management of Unicamp as a sustainable university in the planning of the territorial use and occupation. This integration considers the SDGs and involves the participation of all social actors at Unicamp and its surroundings.

3.1. Integrated Masterplan Planning Areas

The Integrated Masterplan is organized into six planning areas: 1. urban use and heritage, which defines the sectors of vocations and their parameters of quality of occupation, involving the requalification of occupied areas and the expansion of Unicamp; 2. environment, which establishes guidelines for the connection of green areas and the protection and recovery of water courses; 3. urban infrastructure, which brings efficiency - energy, water, waste and information; 4. mobility and urban accessibility, with guidelines that encourage public transport and the reduction of the use of cars, in addition to complete accessibility; 4. social integration, which presents guidelines for valuing and expanding safe social living practices; and 6. university and society, with a focus on integration with the external community.

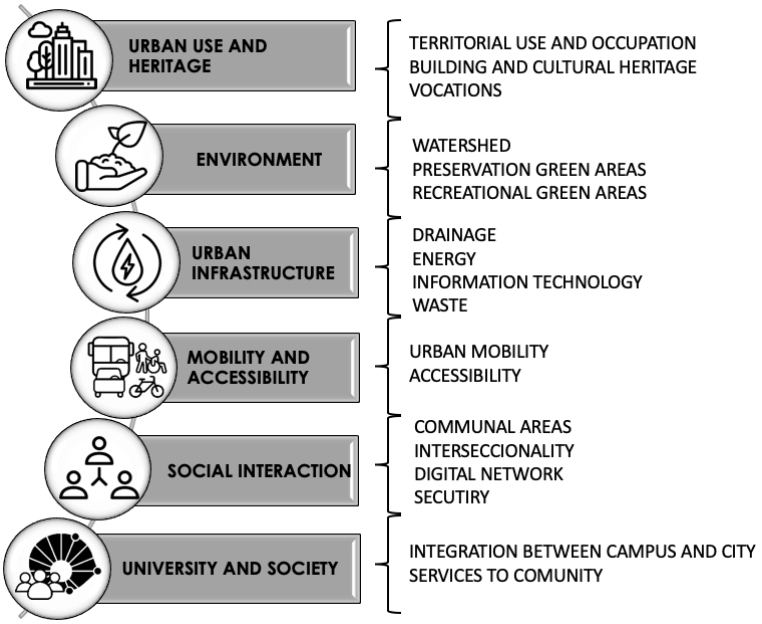

Figure 1 – Integrated Masterplan Planning Areas

3.2. Methodology of Masterplan

The development of the Integrated Masterplan is based on the collaboration of the university community through groups:

- Technical Collaboration Group: formed by the departments responsible for planning, design, execution and civil maintenance at Unicamp - Project Coordination, Health Sector Projects, Systems Division, Maintenance Division, Environment Division, Computer Center, Regional Administration Secretariat, Campuses Living Secretariat and Unitransp - which aims to integrate the urban planning of the campus and collaborate in surveying the panorama, the future scenario of the university and the guidelines for achieving it.
- Conceptual Collaboration Group: formed by professors from Unicamp, which aims to collaborate in the integration of sustainable urban planning concepts in the Integrated Masterplan.
- Associated Collaboration Group: formed by the Technical Management Groups of the Sustainable University Management Group - GGUS: Fauna and Flora, Waste, Water Resources, Energy, Environmental Education and Intelligent Campus. They advise on technical issues for solving urban problems aiming at sustainability.

- Local Community Collaboration Group: formed by students, professors, employees and users of university campuses. This group is part of the masterplan through participation workshops and communication channels: social networks, e-mails, websites and personal contacts.

The collaborations of the groups are made in workshops according the following flow of survey:

- current overview of each of the planning areas considering the strengths and weaknesses and the existing technical surveys;
- desired future scenarios, with the idealized vision for the university in terms of sustainable territorial planning;
- guidelines, with standards to be applied institutionally to achieve the desired scenario;
- urban projects in each planning area, with operations and actions, definition of resources and deadlines required for execution.
- sustainability indicators for the campuses, for monitoring performance and monitoring results in the desired scenarios.

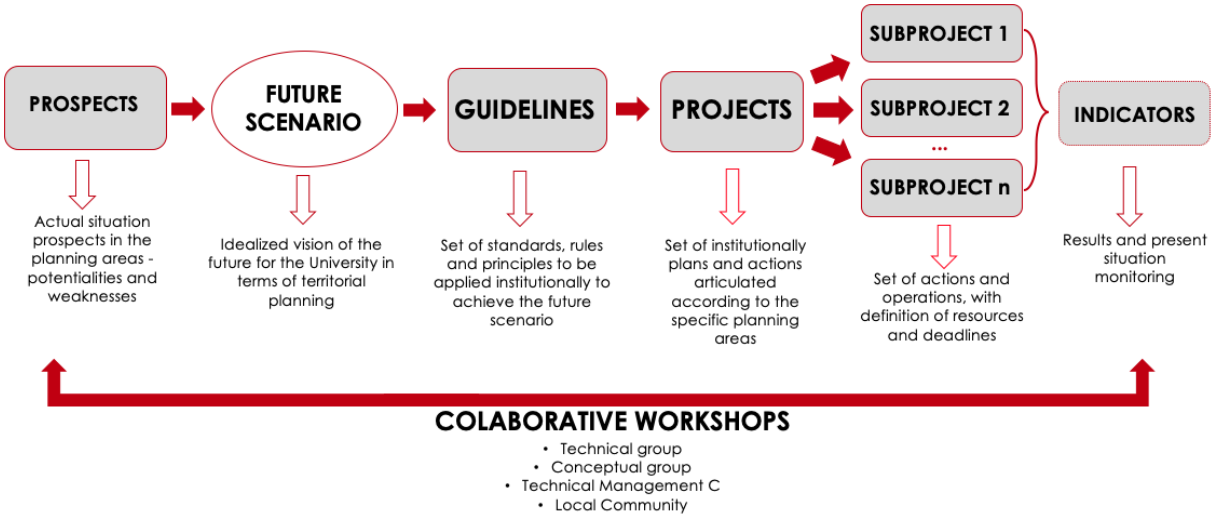

Figure 2 – Methodology of Integrated Masterplan

The definition of the desired scenario for the future of the university leads to the design of the masterplan, with the delimitation of sectors of vocations on university campuses and their parameters of quality of occupation, involving the requalification of occupied areas and the expansion of Unicamp in the Hub International Sustainable Development.

As a continuation of the development flow of a desired scenario, it was established that each Planning Area of the Integrated Masterplan is made up of urban projects, with their respective subprojects, which define the set of actions and instructions to be followed in compliance with established guidelines, always aligned with the other technical bodies of Unicamp and focused on sustainability in the urban environment. The campuses' territories and their evolution are monitored through performance indicators, aligned with the UI GreenMetric sustainable university ranking.

Some of the subprojects that already exist are being developed by technical departments at Unicamp and integrated into the masterplan through its guidelines. Other urban planning and infrastructure projects will emerge as demands of the plan itself and will

be developed through a collaboration network with institutes and faculties, forming living laboratories, according to the planning areas.

The validation of the Integrated Masterplan must be done through a presentation to Unicamp's Institutional Strategic Planning Commission and to the University Council. After the first validation, the program must be constantly updated to be published every 10 years. There have already been two presentations approved, but the version presented was representative only of the Zeferino Vaz campus. Final validation will occur when all campuses are represented. The projects resulting from the Integrated Masterplan will have a continuous flow.

3.3. Guidelines of Integrated Masterplan

After the workshops held among all the collaboration groups, it was possible to develop the guidelines for each of the planning areas. Based on these guidelines, the strategic urban projects for the areas were established. For examples, the following figures represent the guidelines and the strategic projects for the urban use and heritage area and for the environmental area.

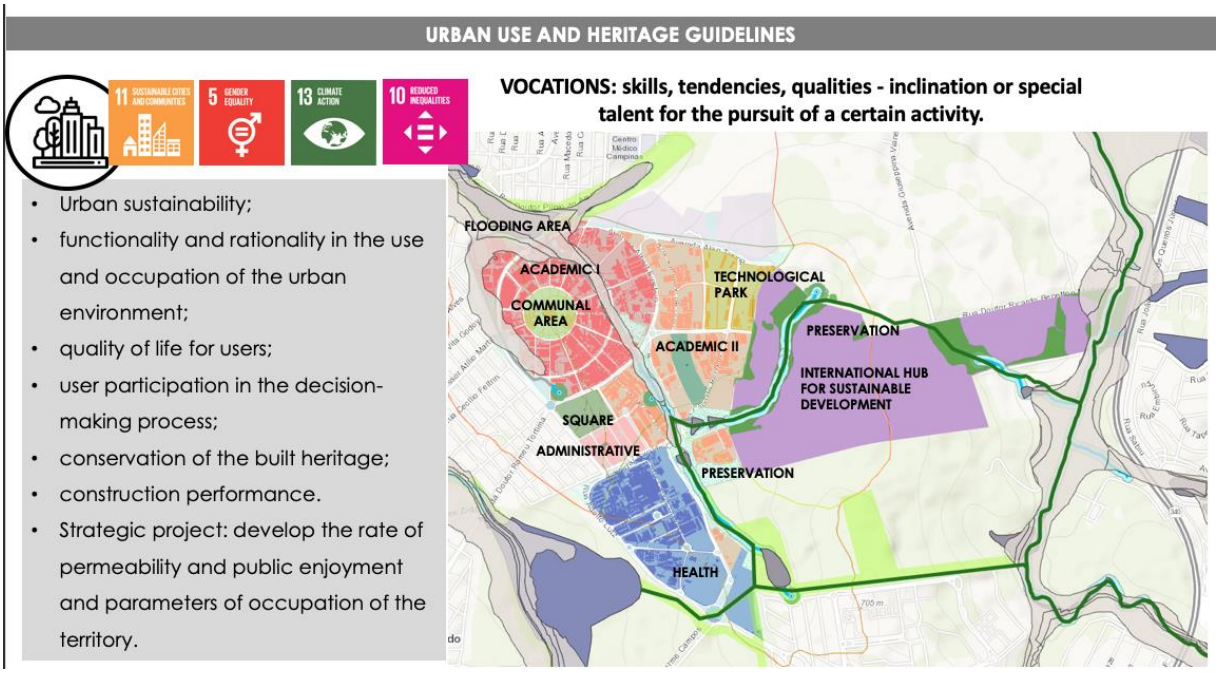

Figure 3 – Guidelines of the Urban Use and Heritage Planning Area

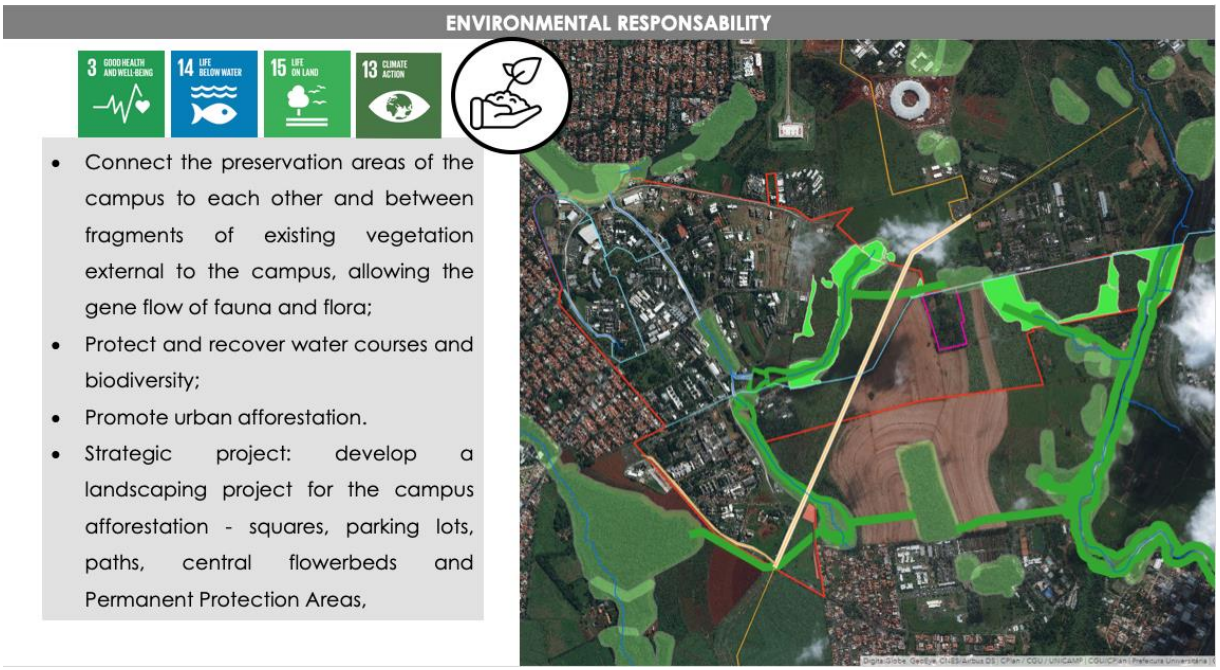

Figure 4 - Guidelines of the Environmental Planning Area

4. Concluding Remarks

The Unicamp Integrated Masterplan is an initiative that promotes sustainable urban planning for the university's territory through guidelines to achieve the desired future scenarios based on the Sustainable Development Goals of the United Nations Agenda 2030. This planning also initiates the process of implementing sustainability on university campuses through subprojects that will be developed based on the strategic projects of each of the planning areas of the Integrated PD.

These subprojects will be developed as living laboratories through collaborative processes between students, professor and Unicamp's technical groups to act on the complex challenges of the masterplan strategic projects. The expected result is that the transformation of Unicamp's space from the perspective of the SDGs can boost its replication to the local community and, in addition, to the city of Campinas.

The interaction of the SDGs with the urban masterplan of Unicamp demonstrate that the sustainability considerations in planning, construction and operation of buildings on campus can improve the respect for nature and society. Also, the living labs for sustainability are an effective strategy to align the sustainable mission of the university with facilities, research and teaching.

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