

Towards the implementation of Sustainable Development Goals at University of Guadalajara, Mexico

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Introduction

The aim of this article is to examine how are higher education institutions in Mexico preparing as means of implementation for the Sustainable Development Goals agenda. Specifically, we develop a case study of the University of Guadalajara (UdG), the second largest higher education institution in Mexico, by identifying its institutional sustainability programs as preconditions towards the achievement of SDG's. For this purpose, we first analyze the evolution of UdG's sustainability programs and their preliminary results, including participation in nationwide higher education sustainable development partnerships and consortiums. We then explore how these institutional programs might harmonize with the sustainable development goals and targets. Finally, and based on the main environmental issues faced by each region of the state of Jalisco, we propose a statewide SDG preliminary agenda that links UdG's outreach and research programs with sustainable development policies of local governments.

Public universities are key stakeholders as catalyzers and mobilize human, technological and research-based resources at the national and regional levels. In the last 20 years, Mexican Higher Education institutions have made some initial efforts to build up regional and national networks in order to coordinate policies towards sustainable development. The balance of these actions is difficult to define due to fragmentation and incomplete information. Overall, results have been modest regarding full implementation of harmonized and systematized green actions within university campuses. Another venue through which sustainable development goals in the higher education context in Mexico is being worked out is through the social responsibility framework. Recently, the Mexican Social Responsibility University Organization (OMERSU) has combined the social responsibility paradigm with sustainability guidelines through a workable platform for national universities. However, the integration of CSR within the sustainable development paradigm could be potentially problematic (Blowfield & Frynas 2005; Behringer y Szegedi, 2016).

Before 2015, Mexican public universities entered through an impasse stage with regards to the implementation of sustainable development policies on campus. This deadlock is now starting to be broken in the context of the sustainable development goals initiative. So the question is how well prepared are public universities in Mexico to migrate to embrace the Sustainable Development Goals and, accordingly, put in place a robust monitoring and evaluation framework.

Public Universities are complex organizations characterized by unclear technology, problematic preferences and fluid participation (Cohen et al, 1972). Under this context, external initiatives such as SDG's implementation at the public university realm imply difficulties and challenges to set out a consensus-based, inclusive and comprehensive framework arena were different stakeholders –researchers, university officials, students and teachers- embrace the sustainable development goals initiative. However, high-caliber external and global initiatives such as SDG's are frequently welcomed by public universities government structures and implemented under a top-down basis.

The National Association for Universities and Higher Education Institutions (ANUIES) recently launched a national-scale survey that gathers data from research bodies within universities to find out whether or not their research line directly contributes to a specific SDG and target. It is a first step towards reporting what Mexican Higher education institutions are doing in terms of SDG's. However, it lacks two fundamental issues that should be taken into account in order to develop better evaluation frameworks that lead to the empowerment of universities and higher education institutions as real means of implementation. First, it assumes that the research community is familiarized with the SDG's before evaluating the SDG literacy among the research community, which is a crucial predictor of SDG success at the implementation level (Higher Education Sustainability Initiative 2017). Secondly, it lacks an additionality component. In other words, how, when and how much are professors at Mexican Higher Education institutions adapting or reframing their research lines and topics due to the Sustainable Development Goals or if they contribute or the Sustainable Development Goals anyway.

Latin American context of Education for Sustainable Development and the measurement of sustainability efforts

According to Bravo (Bravo 2012) institutional environmental planning began to occur among Higher Education Institutions (HEIs) since 1991 with the creation of the University Environmental Program of the National Autonomous University (UNAM by its acronym in Spanish). For the Mexican context the Center for Education and Training on Sustainable Development (CECADESU in Spanish) of the Environmental Secretary (SEMARNAP then, currently SEMARNAT) called in 1998 to the First National Meeting of Higher Education Institutions with Extracurricular Environmental. This meeting took place in the University of Colima, and it was again held in 1999 at the Autonomous University of San Luis Potosí. In the year 2000 CECADESU called to the third meeting at the University of Guanajuato (Universidad de Guanajuato 2013). In March of 2000 the Joint Committee of the National Association of Universities and Higher Education Institutions of México (ANUIES) and SEMARNAP was constituted by the chairs and representatives of the Autonomous University of Coahuila, of the state of México, of the state of Morelos, Nuevo León, San Luis Potosí, Zacatecas, University of Guadalajara, University of Guanajuato, and University of Veracruz (*veracruzana*) as well as representatives of SEMARNAP, CECADESU, and the Secretary General of ANUIES (*Asociación Nacional de Universidades e Instituciones de Educación Superior*) (ANUIES 2001). This Committee planned the Inter-institutional Strategic Action Plan for Achieving Sustainable Development in Higher Education Institutions in which the University of Guadalajara also took part. In the same year 2000, University of Guadalajara was one of the HEI founders of the Mexican Consortium of University Environmental Programs for Sustainable Development known as "COMPLEXUS". The mission of this organization is to "promote the

improvement and quality of academic processes regarding environment and sustainable development through the concurrence and collaboration of the environmental programs or entities of HEIs....”(Universidad Autónoma de Coahuila 2013). Clearly, the vision was very general and overall it was meant to promote sustainable development. Back then, the seventh millenium development goal was oriented to achieve environmental sustainability, but the vision of Mexican HEIs mostly translated into new programs or introducing contents in the curriculum.

In 2001, 2002, 2005 and 2006, University of Guadalajara hosted COMPLEXUS meetings for the development of indicators to measure the contribution to sustainable development of Mexican HEIs. Product of these, COMPLEXUS published a book on indicators meant to measure the contribution of education to sustainability. Clearly most of the HEIs involved in COMPLEXUS thought the mainstreaming of sustainability contents as relevant. There was little or no debate at all of the contribution of the performance of HEIs and facilities management as part of the sustainable development strategy. Much debate occurred even over the pertinence of sustainable development as a development paradigm, Mexico proposed its own approach based on environmental education for sustainable development based on the strength it developed for decades in this area. On March of 2005 strategic sectors, including Secretary of Education signed in México the National Commitment for the Decade of Education for Sustainable Development. Even though all of these efforts have given visibility and importance to the mainstreaming of sustainable development in education, with every change of federal or state administration, it is necessary to refresh and somewhat train the new authorities in order to be able to continue.

The University of Guadalajara was one of the HEI pioneers in Mexico trying to introduce sustainability into its curriculum and its social responsibility. The University’s ability to collaborate with other institutions and the achievement of relevant social impacts has long been recognized.

University of Guadalajara’s experience as pioneer on sustainable development higher education initiatives.

According to Curiel Ballesteros (Bravo, 2012: 144-150.) identifies at least five previous stages of institutional environmental experience at the University of Guadalajara. The first stage according to Curiel occurred between 1989 and 1990 when within the context of a profound academic reform in 1990 the Committee of Ecology and Environmental Education was created. Several members of the academic community collaborated through research, environmental education and the first proposal of an institutional environmental policy for promoting sustainable development and environmental culture This Committee was the first at a national level with these characteristics and objectives. Lots of meaningful evidences have occurred since 1990 ranging from the creation of transdisciplinary programs for the advancement on the knowledge and application of sustainability solutions in Jalisco, among others:

- The creation of the Masters in Environmental Health and the second Environmental Education Master’s program in Mexico,
- The establishment of the first Environmental Management and Economy program in Mexico,
- The creation of an intermunicipal management committee model based on basins known as JIMA (*Junta Intermunicipal de Medio Ambiente*) originally created for the

Intermunicipal management committee of the Ayuquila River lower basin (known as “JIRA” in Spanish) now used in all of Jalisco for intermunicipal environmental management,

- The scientific studies and proposals of several natural protected areas, now declared in Jalisco (Sierra de Manantlán, *Bosque La Primavera* and *Piedras Bola*), among others),

- For two decades University has led a turtle conservation program (Tortugario “La Gloria”) at Tomatlán, Jalisco and a crocodile conservation program (Reptilario “Cipactli”) at Puerto Vallarta, Jalisco, with the involvement of researchers and students,

- For decades the University has attended to poor urbanizations, indigenous communities and slums to provide medical and legal orientation with the attention of professionals and researchers as well as early involvement of students in research opportunities,

- As of 2015 university provides intercultural education for indigenous population in five university centers (north, south coast, Jalisco wetland, coast, and south centers), including tutoring for admission exam, academic tutoring, and intercultural training for professors,

- As of 2015 university provides inclusive education through grants for students with disabilities (deaf, mobility, or visual disabilities), grants for indigenous students,

- In 2013 the university became one of the very few in Mexico to promote day care centers for students who are parents (applies for mothers or fathers who study in the university).

In short, University of Guadalajara has been an innovative and constant contributor for decades for the solution of sustainability problems in Jalisco with meaningful research, critical opinions and clear actions.

Decentralization and the fulfillment of the sustainable development goals

Due to the important administrative reformation that the University of Guadalajara went through as of 1994, the education centers of the city of Guadalajara grouped into disciplinary areas while the education centers located outside of the city continued being multidisciplinary in nature. These university centers, as well as the university high schools, have evolved in different degree of depth and sophistication in the sustainability mainstreaming and the pursuit of sustainability goals. The fact that the university works in different locations scattered through Jalisco, in three different higher education levels (ranging from high school to graduate school) poses a tremendous challenge for the harmonization of institutional sustainability efforts. Many actions have not survived through time or even have translated into more facilities because the effort tended to be voluntary and therefore disarticulate. The lack of an articulated and mandatory sustainability policy for the whole institution in the past, caused that a university center could develop a unique approach to their particular sustainability problems.

In reality, in the past there was not any consideration of the fulfillment of specific institutional sustainability goals, but rather the satisfaction of sustainability necessities both of Jalisco, and of the institution. From its beginning in 2015 the Sustainable University Program intended to document and articulate the abundant and diverse sustainability practices within the 15 university centers and 67 high schools spread throughout all the state of Jalisco. Clearly, these activities evidenced that besides the underlying objective of providing higher education of a greater quality, there was a clear interest of the university community in the achievement of sustainability goals. Social responsibility has also

become a clear issue in the latter years considering the great pressure upon HEIs in order to promote progress and quality of life. The alignment of education goals with social goals and aspirations, has always been a clear priority for the university. Nonetheless, social responsibility has also made evident that the planning and management strategy also reflect the university's compliance and fulfillment of its own mission. Given the size of our university, the impact of our operations and the degree of penetration that the university's actions have in the population of Jalisco, planning, management, and administration, are truly transcendental for the fulfillment of both institutional and planetary sustainability goals given that they are an extension of our education goals. Informal education through institutional practice evidences our social responsibility and is an undeniable tool for massive sustainability education, even outside campus.

Evolution and institutionalization of the Sustainable University Program and Institutional Sustainability Strategy

As of 2015 the Sustainable University Program of the University made a conscientious exercise of "collecting" and documenting these efforts evidencing a rich array of sustainability practices some oriented to cross-cut approach of sustainability in the curriculum of the different programs, others oriented to make a more efficient management of facilities, observing that many of these also impacted on a higher quality education with a sustainability approach. Also, the program started several other institutional exercises as a means of diagnosing the state of sustainability practices in the institution. From 2015 to 2016 this program made a thorough research of the insertion of sustainability literacy in the curriculum, as well as the state of management practices as related to sustainable practices. Product of such exercise, University of Guadalajara developed several instruments which allow not only a great array of management practices, but also the more accurate accountability of institutional sustainability indicators. Among others, these instruments were developed and are currently being institutionally piloted:

- A Tree inventory of all adult trees in university land,
- A greenhouse gas inventory for all the university centers in Guadalajara in order to plan responsible carbon reduction goals,
- An oversight of the environmental compliance of management practices,
- A training course on Sustainable Procurement for all the personnel involved in procurement in order to develop both a policy and an inventory of sustainable providers in every region,
- Piloting of an introductory course of Education for Sustainable Development approach as applied to Mexico and Latin America for professors,
- Development of the pilot application of a sustainable management system in two of our largest university centers (based on environmental impact and population),
- Experimental application of a water footprint measurement model in two university centers which are located in an area of high climate change vulnerability.

Additionally, in 2016 University of Guadalajara also started the University Integral Program of Energy Transition (PUITE in Spanish), which is the greatest and most powerful energy strategy for the adaptation to climate change. This program has several dimensions. The most significant ones for the effects of this paper:

- Transition to clean energy through solar farms, two of which are already being built in Jalisco,
- Transition from fuel based to electric or hybrid vehicles in all the institution,
- Verification of energy efficiency through constant monitoring of electricity

consumption in university facilities.

Also in 2016, the Inclusive University Program was created in an effort to articulate diverse social actions such as intercultural programs in communities with a high indigenous student population, actions for the integration of students with disabilities, and day care centers for promoting the greater integration of young parents who study at the university. These actions together with the long practiced programs of social intervention through medical and legal orientation evidence a profound commitment for the fulfillment of social needs.

Strategic partnerships with public, private and social sectors for the fulfillment of SDG's

As commented above, the actions currently being developed through the Sustainable, Inclusive and Energy Transition University programs evidence the integral approach of the University of Guadalajara for contributing to the sustainable development goals. Currently the university is clearly focused in the approach of the following SDGs:

- SDG4, quality education, particularly goal 7 through the introduction of education for sustainable development approach through professor training and in the production of electronic materials which introduce contents and practice for students,
- SDG5, particularly 5.4 mainstreaming gender equality through the day care centers program,
- SDG6, water access and sanitation particularly 6.3 and 6.4 with policies oriented to the reduction of the water footprint, and establishment of drinking stations in all education centers,
- SDG7, clean energy, particularly 7.1 and 7.2 through all the actions of the energy transition program,
- SDG12, sustainable consumption and production through the actions of the sustainable university program, training of administrative personnel for the life cycle and sustainable procurement approach, preventive verification of compliance of environmental norms for adequate disposal of solid waste, and water discharges, and the promotion of sustainable lifestyle through safe use of bicycle as well as non-smoking campus strategy,
- SDG13, climate action particularly 13.1 and 13.3 both through the sustainable university program and energy transition strategy through the introduction of measures of adaptation, also through the change of equipment such as vehicles and lighting fixtures, and through the consideration of specific actions of adaptation in education centers of high vulnerability (centers likely to have water shortages in the near future are developing rainwater catchment as well as reuse of treated water),
- SDG14, marine life in several of its specific goals is thoroughly attended through research on species, coastal life, and consciousness over the effects of human activities. Also the sustainable university program collaborates with sustainable infrastructure for the turtle and the reptiles programs,

- SDG15, land ecosystems, the sustainable university program is contributing to this objective through its tree inventory. The actions for classifying and mapping the more than 15000 adult trees in university property promotes consciousness and evidences action. Our inventory also evidenced the need to introduce more and native species for the renovation of our vegetation, contributing to the strengthening of local biodiversity and its corridors,
- SDG16, peace, justice and solid institutions is an important commitment for our institution. Sustainability, inclusiveness and energy strategy are committed to transparency, the rule of law, and the protection of human rights.

Discussion.

Currently, one of the main challenges for the implementation of Sustainable Development Goals at the University of Guadalajara is not about lack of initiatives and actions towards sustainability but rather on how to trickle down the SDG's from the macro to the organization lower levels so that students, teachers, researchers and administrative workers alike embrace the SDG's and its translation to specific sustainability actions on a daily basis. Moreover, given the thematic scale and regional scope of the University of Guadalajara, the issue at stake is how to identify and construct sustainability indicators at the regional campuses level. In doing so, we propose a dual strategic planning approach, firstly by running the Living Laboratory framework as a tool for introducing and target the sustainable development goals into the public university system, particularly at the University of Guadalajara. The Living Laboratory framework implies the "development of new products, systems, services, and processes, employing working methods to integrate people into the entire development process as users and co-creators, to explore, examine, experiment, test, and evaluate new ideas, scenarios, processes, systems, concepts and creative solutions in complex and real contexts" (Evans et al, 2015). All of this related to context-based sustainable development solutions.

The second strategic intervention to accelerate SDG implementation processes is by harnessing University of Guadalajara as a partnership-builder at the local level. Given UdG's geographically decentralized model, the second interaction arena of University of Guadalajara in order to achieve the Sustainable Development Goals is through intervention of local and state-order sustainable development issues. In order to propel the SDG initiative into the outreach off campus level, it is necessary to align applied research and outreach activities with local environmental sustainability agendas based on local sustainable development issues.

In this regard, we also propose a two-fold differentiated and complementary strategy that firstly addresses Guadalajara's Metropolitan Area environmental issues that have degraded in the last years such as air quality, land-use, biodiversity and natural protected areas and align them accordingly with the corresponding SDG. On the other hand, the eight regional campuses of the University of Guadalajara provide a unique and diverse platform to address local sustainability issues through applied research, outreach and capacity-building. On effectiveness grounds, we propose then that, in principle, each regional campus should take care of the most suitable SDG bundle –including targets and indicators, either already existing or constructed- that tackles the most significant sustainable development issues at the regional level.

Table 1 depicts the main environmental issues at Guadalajara Metropolitan Area and the Metropolitan University Center that should be held accountable to lead in a specific SDG, target and set o indicators, according to the nature and expertise area for each campus. Due to the complexity that each goal implies, it is necessary to take an interdisciplinary approach that cross-cut beyond specific campuses. That being said, it is important that each campus takes the lead and responsibility of at least one Sustainable Development Goal. In a complementary way, table 2 depicts the main environmental issues at the regional level of the western state of Jalisco, Mexico thereby suggesting which SDG, target and sett of indicators should be taken at the regional campus level, seen as a node or cluster.

Table 1.University of Guadalajara´s Metropolitan Thematic Campuses and Local Environmental Issues.

University of Guadalajara Metropolitan-Thematic Campus	Environmental Issues of Guadalajara Metro Area	SDG	Target	Indicator
Arts, Arquitecture and Design University Center (CUAAD)	Land Use and urban sprawl.	11. Make Cities and Human settlements inclusive, safe, resilient and sustainable.	11.1 By 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums.	11.1.1 Proportion of urban population living in slums, informal settlements or inadequate housing.
			11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety.	11.2.1.Proportion of population that has convenient access to public transport, by sex, age and persons with disabilities
			11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries	11.3.1 Ratio of land consumption rate to population growth rate. 11.3.2 Proportion of cities with a direct participation structure of civil society in urban planning and management that operate regularly and democratically
	Transport		11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities	11.7.1 Average share of the built-up area of cities that is open space for public use for all, by sex, age and persons with disabilities.

Science, Technology, Engineering and Mathematics University Center (CUCEI)	Air Quality Waste Management	11. Make Cities and Human settlements inclusive, safe, resilient and sustainable	11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.	11.6.1 Proportion of urban solid waste regularly collected and with adequate final discharge out of total urban solid waste generated, by cities. 11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities
Tonalá University Center (CUTONALÁ)	Energy inefficient consumption Water Supply and Sanitation	7. Affordable and Clean Energy	7.1 By 2030, ensure universal access to affordable, reliable and modern energy services.	7.1.2 Proportion of population with primary reliance on clean fuels and technology.
Social Sciences and Humanities University Center (CUCSH)	Rule of Law, Enforcement, Transparency and Accountability	Peace, Justice and Strong Institutions	16.5 Substantially reduce corruption and bribery in all their forms	16.5.1 Proportion of persons who had at least one contact with a public official and who paid a bribe to a public official, or were asked for a bribe by those public officials, during the previous 12 months
Health Sciences University Center (UCS)	Environmental Quality and Human Health.	3. Good Health and Well Being	3.4 Reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.	3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease. 3.4.2 Suicide mortality rate
Economics and Management University Center (CUCEA)	Production and Consumption Negative Externalities.	11. Responsible Consumption and Production	11.A Support positive economic, social and environmental links between urban, per-urban and rural areas by strengthening national and regional development planning	11.A.1 Proportion of population living in cities that implement urban and regional development plans integrating population projections and resource needs, by size of city
Biological and Life Sciences University Center (CUCBA)	Overfishing and overharvesting	14. Life below water	14.4 Effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics	14.4.1 Proportion of fish stocks within biologically sustainable levels.

Source. Own adaptation from UdG's Institutional Development Plans, State of Jalisco and Municipal Development Plans.

Table 2. University of Guadalajara’s Regional University Network and Local Environmental Issues

University of Guadalajara Regional Campus/ Location	Main Environmental Issues	Sustainable Development Goal	Target	Indicator
Los Valles University Center. Ameca, Jalisco	Greenhouse Gas Emissions due to sugar cane and agave exploitation.	7. Affordable and clean energy	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption
Coast of Jalisco University Center. Puerto Vallarta, Jalisco (CUCOSTA)	Urban Sprawl, Deforestation and Water Use for the Tourism Sector	15. Protect, Restore and Promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and biodiversity loss	15.4 Ensure the conservation of mountain ecosystems, including their biodiversity, in order to enhance their capacity to provide benefits that are essential for sustainable development	15.4.1 Coverage by protected areas of important sites for mountain biodiversity
Southern Coast of Jalisco University Center. Autlán, Jalisco (CUCSUR)	Watershed Pollution from agriculture and livestock. High level of emissions due to deforestation and degradation.		15.2 Promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally	15.2.1 Progress towards sustainable forest management
Southern Region University Center. Zapotlán Jalisco (CUSUR)	Wetlands management Deforestation and natural protected areas management		15.1 Ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements	15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type

La Ciénega University Center. Ocotlán, Jalisco (CUCIENEGA)	Water Supply at the Chapala Lake Reservoir	6. Ensure availability and sustainable management of water and sanitation for all.	6.3 Improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.	6.3.2 Proportion of bodies of water with good ambient water quality
Northern Region University Center. Colotlán, Jalisco (CUNORTE)	Desertification, Water Supply	2. Zero Hunger	2.4 Ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.	2.4.1 Proportion of agricultural area under productive and sustainable agriculture
Los Altos University Center. Tepatitlán, Jalisco. (CUALTOS)	Water Supply, Livestock and Agricultural Discharges		6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1 Proportion of wastewater safely treated 6.3.2 Proportion of bodies of water with good ambient water quality
Los Lagos University Center. Lagos de Moreno, Jalisco (CULAGOS)	Dam Construction and Environmental Conflict.	6. Ensure availability and sustainable management of water and sanitation for all.	6.5 Implement integrated water resources management at all levels, including through transboundary cooperation as appropriate.	6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation

Source. Own adaptation from UdG's Institutional Development Plans, State of Jalisco and Municipal Development Plans.

Conclusions

This quick review makes evident that University of Guadalajara has embraced an integral approach of sustainability and indirect. Nevertheless, there are enormous challenges ahead. Internally, the institutionalization of the strategy through a formal policy is a great necessity in order to be able to guarantee permanent budget and permanent capacity building in these three areas. Also, it is necessary that education authorities at state and federal levels, to observe and consider sustainability actions on HEI as part of the evaluation strategies given that these actions provide informal education through life experiences which also makes societies conscious and resilient.

Also, a great challenge lies ahead in our interaction with education authorities at state and federal levels. Up to now, sustainability actions are considered voluntary, and even though all HEIs should be committed to promote either environmental education, education for sustainability or climate change education, it is a fact that there is no indicator in any state or federal education instrument that verifies compliance with the general commitment. Such enforcement is necessary in order for HEIs to consider sustainability actions seriously, allocate adequate budgets, and adequate personnel. Also, based on the experience acquired by our university, disarticulation and improvisation also cause great frustration in the community because great practices, and innovative ideas cannot be documented, replicated or continued and the knowledge acquired may be lost. On the other hand, the formal observation and consideration of sustainability actions on HEI should be part of the evaluation strategies given that these actions provide informal education through life experiences for students, professors and administrative staff multiplying exponentially the effect of education making societies conscious and resilient.

Another opportunity also lies within the environmental authorities (mainly state and federal). Sustainability actions from HEIs should have a specific and greater support from environmental authorities. Given that large amounts of the population are exposed to good (or bad) sustainability practices and habits, these tend to be replicated elsewhere. If HEI has a notorious sustainability performance, it will be assertively contributing to SDGs as well as promoting a greater quality of life to all its members. Specific public policy and instruments should be made to enhance sustainability practices at HEIs and even be rewarded by it, based on the educational effects these good practices have on the population.

There is an extraordinary opportunity for public HEIs such as the University of Guadalajara to make a substantial and integral contribution to society if government agencies could finance the research of real life sustainability problems in order to promote the involvement of researchers and academics applying knowledge in the solution of real life problems. Multidisciplinary research as well as early involvement of students in reality could detonate the long pursued sustainability abilities and competences. A hands-on approach to real life sustainability issues in harmony with the living laboratory framework with government support could induce a more effective focus on the SDG goal fulfillment as well as a powerful contribution on applied education for sustainable development. Finally, given the scale and scope of the University of Guadalajara decentralized network, it lends itself for fostering differentiated interventions for SDG achievement alongside with local and state governments and civil society partnership in order to establish bottom-up regional sustainable development indicators.

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