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Green ideas, technology, university, and business in the 21st century

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Abstract---The link between university and business has become more intrinsic due to the need to articulate green ideas as part of sustainable development, with technological development; although the latter has historically generated unemployment, on the one hand; on the other hand, it has increased production and productivity levels, affecting the population through cost reduction. In this context, the general objective was to establish the relationship between green ideas and innovation with the link between the University and the company, as actors capable of promoting the search for a balance between technological and economic development and the environment. These factors, when harmonized together, make it possible to achieve sustainable and sustainable development.

Keywords---green economy, school discipline, technology transfer.

Introduction

In this research, the literature review related to the topic can be found at first, so that the theoretical background is sufficient to support this work. This review starts by identifying the meaning of green ideas, technology, and their

relationship with the university and the company. All of them conjugating in favor of sustainable development. Currently, the development of green ideas has gained significance and is in full growth, as a condition to create businesses of the same type (Calzada *et al.*, 2021), responding in this way to the environmental problems caused by climate change and human action. At the same time as recognizing the need to generate new green businesses and ventures, these have to be interrelated with the development of environmentally friendly technologies (Porcelli & Martinez, 2016) avoiding pollution and promoting sustainable development (Porcelli & Martinez, 2016). the methodology used will also be shown, as well as the results obtained and their interpretation.

Literature review

Green ideas form a set of criteria that should and can be adopted for the care of the environment; especially in the circumstances of the growth of cities that jeopardize and negatively impact the sustainable development of society. These ideas can range from the reduction in the consumption of raw materials and energy to minimum tolerable levels to the reuse of waste and residues framed in the emergence of green rings as an instrument for the urban development of cities (Aguado *et al.*, 2017). Green entrepreneurship is another idea that drives green economies according to Ahmad *et al.* (2015) for which green entrepreneurship plays a crucial role as stated by Yi (2021), adding to it the innovative potential (Pertuz *et al.*, 2021) of green type, oriented to find new ways of production of both the individual entrepreneur and the company.

In short, green entrepreneurship means creating new business opportunities considering the parameters of environmental awareness as stated by Plaza *et al.* (2021), and innovating at the same time the production process. Green ideas are developed hand in hand with green innovation, as this leads to improved production levels and productivity. This innovation has several functions such as the strengthening of clean energies that lead to storing and achieving renewable and sustainable energy (Nudelman, 2016). This process will eventually contribute to obtaining a sustainable and sustainable society. To achieve a sustainable society, the State through all its forms of government acts directly and indirectly, under the protection of legislation, intending to promote green ideas and technologies.

For the fulfillment of the purposes related to green ideas and technologies, public policies are issued; however, in research developed by Angelelli *et al.*, 2011; Del Bello & Abeledo, 2007; Zurbriggen & González, 2010 it is exposed that in Latin America the failures of these policies are recurrent, which slows down the relationship between technology, green ideas, university, and business. In some Latin American countries as Loray, (2017) points out, technological clusters have been formed linking research organizations with companies and improving the competitiveness of the latter. It should be noted that Latin American countries promote innovation through their different ministries. In the same order of innovation, it is clear that the economic sectors have to get involved, so that green ideas and technologies can go hand in hand sponsored by the research that should be generated from educational centers. In this regard, Ruiz *et al.* (2017)

argue that much more progress could be made if companies and educational centers promote research in green technologies.

In the field of innovation and technological development, the university is a key player, these competencies are part of its business and its role within a society that needs its contribution to achieve better living standards, respect the environment, and other important variables. All these actions and activities on the part of the university are especially aimed at achieving social development (Medina, 2018). The university, in the scenario that links green ideas and technologies with companies, becomes the center from which technology transfer arises (Jimenez, 2016). In Latin America, the investment made by universities and companies in the field of green ideas and innovation results in an incipient relationship compared to that of developed countries. This correspondence is necessary since it reflects a reciprocal relationship between universities and companies (Arias *et al.*, 2012) that contributes to obtaining goods and services with market value, in addition to a great social impact with responsibility towards the environment (Miguel Medina Romero, 2020). This link, which is manifested in the relationship of cooperation between university - company, enunciates a responsibility towards all members of society, towards new forms of production and entrepreneurial initiatives of green character, where technology plays a crucial role capable of generating more value to goods and services and be more competitive. The following is a scenario of university-industry cooperation.

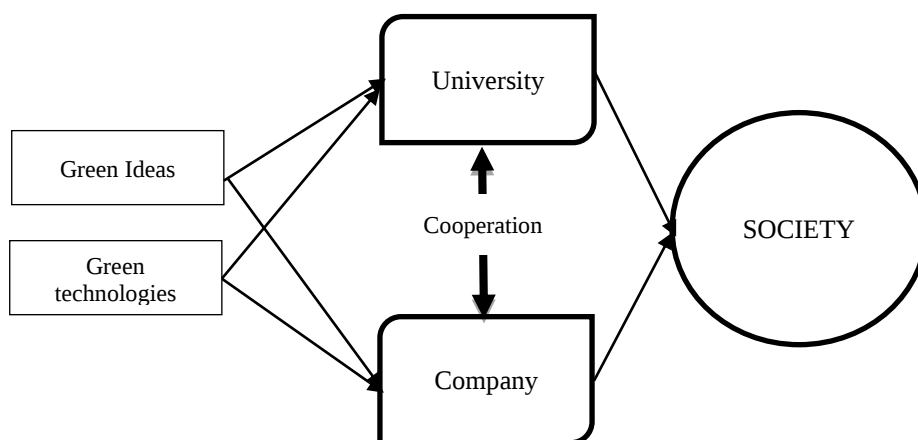


Figure 1. University-industry cooperation relationship

Research Methodology

This is documentary research based on the analysis and theoretical contributions of different currents of thought related to sustainable development, innovation, and technology, and their relationship with the university and the company. It also includes a statistical analysis that identifies the importance of innovation worldwide and the participation of companies in the environmental protection of Ecuador. This research starts from the understanding of what green ideas are, as fundamental criteria to develop green enterprises, for these purposes the most relevant contribution was identified, as well as the understanding of what

innovation implies, to finally understand the link with the university (Miguel Medina Romero, 2021).

Based on the understanding of the role of the university in a new context that considers sustainable development as an opportunity to achieve better levels of productivity and competitiveness, the relationship of dependence between academia and business is observed, through the establishment of cooperation agreements for the transmission of knowledge, technology, and innovation that benefits the environment and society in general. Finally, to understand the efforts made by countries to find a new path of development, statistical information related to the Global Innovation Index, GII, and the percentage of companies in Ecuador that have made current expenditures aimed at protecting the environment in the period 2018-2019 is analyzed. The methodology used in the summary consisted of obtaining various bibliographic sources that after being analyzed and refined allowed knowing the relationship between those involved with technology and green ideas.

Results and Interpretation

The importance attributed today to university investment in natural resources for environmental conservation is significant since it is known that this contributes to the survival of the planet. It should be kept in mind that people, society, and the economy depend essentially on the natural processes produced by ecosystems (Riera *et al.*, 2005). These processes not only can and are produced in the natural scenarios of the environment but also in those surrounding the university context, inside the academy, and in the places where any of its members participate, in such a way that the natural balance can be preserved. In the search for balance, the participation of the University as the center of free thought is in charge of strengthening scientific, economic, cultural, social, and environmental development with green ideas and technologies that break with the traditional way of producing and undertaking. In this way, it is promoting sustainable and balanced development between the needs of the present, without compromising the welfare of future generations (Brundtland, 1985).

To achieve such development, it is essential to promote adequate environmental education (Novo, 2009), regardless of the professional training pursued, it is possible to achieve sustainable development; therefore, the dissemination and implementation of green ideas within the academy is an essential condition to promote this type of development. Green ideas turn academies into sustainable universities, whose sole purpose is to protect the environment and the planet as a whole. These ideas range from the creation of green areas known as greenhouses, in different places inside the university that can be extended to the homes of all the members of the different higher education centers. It is also possible to reduce the use of pollutants through the implementation of solar panels that reduce electricity bills, as well as the application of the three ecological R's, reduce, reuse, and recycle, to promote savings and reduce pollution, making everything previously produced reincorporated back into the value-added chain. In this order, there are: clothing, plastics, cell phones, among others and, the elaboration of composting that modifies the ecological thinking in a circular economy

converting the impact of human activity, into a deeper and lasting transformation (Lett, 2014).

In Ecuador, for example, agreements are made between universities and public and private companies, which are part of the linkage processes. In addition, it is necessary to include the family sector in a general way. This aspect is worth taking into account because of its impact on their finances, which would improve their income levels. The participation of students in obtaining resources, including financial resources, through self-management, is a good option to obtain a green university. Achieving a green university entails making investments, which are possible with self-management, for which both educational institutions, the family sector, public and private companies, as well as the government as a whole have to contribute directly or indirectly, establishing equitable participation agreements that, in short, will contribute to the sustainable development of the economy and society.

The concept of sustainable development is associated with innovation and technological development, which are promoted from the point of view of the State in some cases and others on its initiative, interrelating governments, companies, universities, families, and the environment; however, there is a deep concern when the technological criterion is involved, since it is well known that scientific and technical development ends up displacing labor, as has occurred since the second half of the 17th century with the first industrial revolution. The World Innovation Index calculates the position of countries concerning this variable, which measures the initiative of all countries in the development of new processes, and ideas, among others, aimed at improving competitiveness and productivity. Innovation is essentially a key factor for sustainable development.

The following table shows the top two positions by region worldwide in the innovation index. Next, it can be seen that the leader in innovation is Switzerland in Europe, which occupies the first position, followed by Sweden in the same continent, while the third position is occupied by the United States of America. In Latin America, Chile leads innovation, ranking 53rd, followed by Mexico in 55th place. In Asia, on the other hand, innovation is led by the Republic of South Korea in 5th place. In Africa as a whole, Israel leads innovation, ranking 15th, followed by the United Arab Emirates, which ranks 33rd.

Table 1
Global Innovation Index, GII 2021

Region/Position	Economy	Overall ranking in the 2021 Index
North America		
1	United States of America	3
2	Canada	16
Sub-Saharan Africa		
1	South Africa	61
2	Kenya	85
Latin America and the Caribbean		
1	Chile	53

2	Mexico	55
Central and South Asia		
1	India	46
2	Iran (Islamic Republic of)	60
North Africa and West Asia		
1	Israel	15
2	United Arab Emirates	33
Southeast Asia, East Asia and Oceania		
1	Republic of Korea	5
2	Singapore	8
Europea		
1	Switzerland	1
2	Sweden	2

Source: World Intellectual Property Organization (2021), Global Innovation Index.

Scientific and technical development, as a dimension capable of generating greater and better production by making appropriate use of the factors of production, such as natural resources, labor, and capital, has made it possible to reduce the differences posed by the barriers of space and time, which has translated into greater productivity, lower production costs and an increase in the well-being and savings of end consumers. Despite the difficulty presented by technological development, in the face of labor displacement, societies have always found ways to generate employment; this has served to design a whole set of public policies for science, technology, innovation, and development (Thomas, 2012), so technological development does not have a direct impact on unemployment.

Technological development has resulted in obtaining production at lower costs and in the shortest possible time, coexisting with the generation of unemployment and unemployment of the labor force. In this area, there are two results, on the one hand, the employed personnel and on the other hand, the unemployed due to technology. But what would happen with the workers of the different companies that are employed, the following questions can be asked in this regard:

- Should the working day be reduced if everything is done in less time, reducing salaries?
- Should the working day be reduced if everything is done in less time, without reducing wages?
- By reducing working hours and wages, will purchasing power be lost by restricting demand, so that it is not appropriate to lower wages?
- If working hours are reduced at the same time as wages are reduced, will workers be able to develop new enterprises?
- By reducing the working day without reducing wages, will purchasing power be maintained, maintaining demand, on the one hand, while workers will have more freedom and leisure time (Miranda, 2006) for their individual, social and family development, among others?
- If technological development were to take place and affect the level of employment and income, would workers be able to develop and undertake green ideas?

- In the condition of a new scenario where employment is generated and considering that there is more time available for workers, could they develop green innovations?
- Are the university and the company in charge of looking for the way that leads to achieving sustainable and sustainable development in such a way that society is not affected?

Given the greater availability of free and leisure time for the working-age population, there is an opportunity to develop new talents, ideas, and skills, so that sustainable development becomes even more relevant since it is not possible if the population is in a position to produce does not have the necessary time to interact with the environment. It then appears the possibility of developing the capital that, like intellectual property, is capable of transforming through entrepreneurship and creativity the goods and services that society needs. In these circumstances, the orange economy arises (Duque & Buitrago, 2013), as an opportunity for the lack of employment in society. It is important to emphasize that one can freely choose what goods and services to create or offer, as well as what should or should not be demanded. It involves identifying the needs of the family sector, such as financial, social, and cultural, among others, which has adequately interpreted the requirements of businesses and society as a whole, to achieve their well-being.

In the context described above, behavioral economics, which proposes the nudge theory, becomes relevant (Thaler & Sunstein, 2017). The theory known as nudge argues that, through an appropriate impulse, the population can be pushed to adopt decisions that will benefit them in the long term. This behavior of the economic subjects determines what to buy and how much, motivated by the different levels of satisfaction that will be obtained at the moment of using or buying goods and services. Economic and social welfare can be achieved jointly with all members of society, including the University, as the center that must show the way forward to achieve sustainable and sustainable development. Development then implies the co-participation between universities, Governments, Businesses, and Families, which must interrelate, to contribute to each one with all available resources, establishing strategic alliances that contribute to achieving individual and collective welfare, where the environment is the essential component to achieve it.

The following table shows the percentage of companies by economic activity and country that made current expenditures on environmental protection and natural resource management activities. In the same table at the national level, it is observed that in 2018 38.48% of the companies made expenditures for environmental protection, for the following year it decreases to 37.20%, which reflects a negative decrease of - 1.28%. In the information below the companies engaged in mining and quarrying activity significantly decreased their environmental expenditures. On the other hand, companies in the manufacturing industry, administrative and support services, and financial and insurance activities have invested the most in environmental protection.

Table 2
Current expenses for environmental protection of companies in Ecuador, 2018-2019

Economic activity	Percentage of companies with environmental expenditures		
	2018	2019	Percentage change
Human health care activities	89,10%	86,89%	-2,21%
Water distribution, sewage, waste management and sanitation	86,72%	85,23%	-1,49%
Mining and quarrying	89,78%	82,64%	-7,14%
Manufacturing industry	69,19%	78,74%	9,55%
Administrative and support service activities	25,24%	34,56%	9,32%
Financial and insurance activities	12,73%	17,86%	5,13%
Other economic activities	31,26%	27,60%	-3,66%
National level	38,48%	37,20%	-1,28%

Source: National Institute of Statistics and Census, (2021) Module of environmental economic information in companies, Enesem, 2019

The aforementioned development cannot be achieved if the participation of governments and companies have not responsibly established their commitment to the environment, excluding those who privilege individual well-being generated through corruption, to the detriment of the collective, and excluding those who curb and restrict free initiative and the capacity to choose to the detriment of better well-being. Based on the above reality, the following model is presented, which serves as a basis for the development of future lines of research.

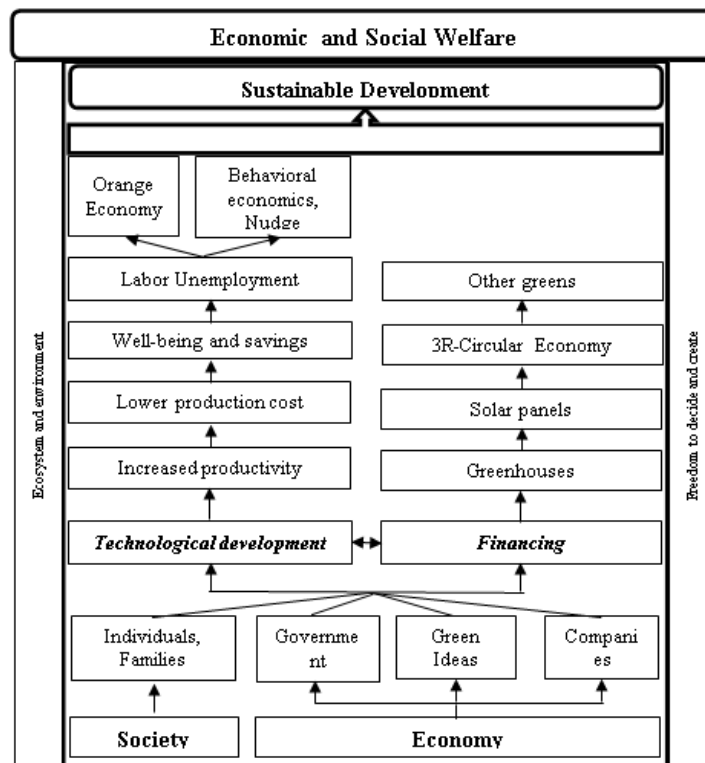


Figure 1. Model for achieving economic and social welfare

Conclusion

After analyzing the importance of the link between universities and companies and between them and sustainable development, the following conclusions are presented: Green ideas can be developed by all members of society whether they are employed or not. This option is a response to the need to find new forms of production that respect nature and the environment. Green ideas can be strengthened with innovation, so that new processes, ideas, and ways of producing can emerge; this will improve the competitiveness levels of micro, small, medium, and large companies, as well as their income levels. Although technological development tends to generate unemployment, it is also true that by allowing goods and services to be produced in less time, workers will have greater advantages to develop their skills, developing new ideas and green innovations that will benefit society as a whole. The relationship between university and business is one of cooperation and constitutes the core from which green innovation and technology transfer emerge. This link pursues the sustainable and sustainable development of the whole society in general, for this reason it is essential that investment is efficiently channeled towards what makes possible the achievement of these goals outlined by universities and companies in all countries of the world.

References

- Aguado, I., Barrutia, J. M., & Echebarria, C. (2017). Green Rings: Some European experiences. *Boletín de La Asociación de Geógrafos Españoles*, 73, 33–60. <https://doi.org/10.21138/BAGE.2408>
- Ahmad, N., Halim, H., Ramayah, T., & Rahman, S. (2015). Green entrepreneurship inclination among generation y: the road towards a green economy. *Problems and Perspectives in Management*, 13(2), 2–8. [http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/prperman_2015_13_2\(contin.\)_11.pdf](http://www.irbis-nbuv.gov.ua/cgi-bin/irbis_nbuv/cgiirbis_64.exe?C21COM=2&I21DBN=UJRN&P21DBN=UJRN&IMAGE_FILE_DOWNLOAD=1&Image_file_name=PDF/prperman_2015_13_2(contin.)_11.pdf)
- Angelelli, P., Gordon, A., Di Marzo, E., & Peirano, F. (2011). *Investigación científica e innovación tecnológica en Argentina: Impacto de los fondos de la Agencia Nacional de Promoción Científica y Tecnológica*. Inter-American Development Bank. <https://books.google.es/books?hl=es&lr=&id=uTSGDwAAQBAJ&oi=fnd&pg=PA7&dq=Peirano,+Fernando.+2011.+“El+FONTAR+y+la+promoción+de+la+innovación+en+empresas+entre+2006+y+2010”.+En+Investigación+científica+e+innovación+tecnológica+en+Argentina.+Impacto+de+los+>
- Arias, L., Portilla, L., & Fernández, S. (2012). Vinculación universidad empresa como formador de capital humano para la competitividad e impacto social. *Scientia et Technica*, XVII(52), 59–64.
- Brundtland, G. (1985). World commission on environment and development. *Elsevier*, 14(1), 26–30. <https://www.sciencedirect.com/science/article/pii/S0378777X85800408>
- Calzada, G., Merino, R., Rallo, J., & García, J. (2021). Study of the effects on employment of public aid to renewable energy sources. *Procesos de Mercado: Revista Europea de Economía Política*, VII(1), 13–70. <https://doi.org/10.52195/PM.V7I1.280>
- Del Bello, J., & Abeledo, C. (2007). Reflexiones sobre cuestiones pendientes de la Agenda de Política en Ciencia, Tecnología e Innovación de Argentina. *Primer Congreso Argentino Sobre Estudios Sociales de La Ciencia y La Tecnología*. <https://www.google.com/search?q=Del+Bello%2C+Juan+Carlos+y+Carlos+Abeledo.+2007.+Reflexiones+sobre+cuestiones+pendientes+de+la+Agenda+de+Política+en+Ciencia%2C+Tecnología+e+Innovación+de+Argentina.+www.cds.unb.br%2Fobmts%2Findex.php%2Facervo-esct%2F...%2F>
- Duque, I., & Buitrago, P. (2013). *La Economía Naranja: Una oportunidad infinita*. Inter-American Development Bank. <https://books.google.es/books?hl=es&lr=&id=I9N2DwAAQBAJ&oi=fnd&pg=PA13&dq=economía+naranja&ots=ka9ZTos0hP&sig=myDhO0QXG3KO8ztlUhz2ZDGLk#v=onepage&q=economía+naranja&f=false>
- Instituto Nacional de Estadísticas y Censos. (2021). *Módulo de información económica ambiental en empresas. Enesem 2019*. INEC.
- Jiménez, A. (2016). Relaciones universidad-empresa: Hacia una productividad basada en innovación. *Gestión y Tendencias*, 1(2), 7–10. <https://doi.org/10.11565/gesten.v2i1.11>
- Lett, L. (2014). Las amenazas globales, el reciclaje de residuos y el concepto de economía circular. *Revista Argentina de Microbiología*, 46(1), 1–2. <http://www.redalyc.org/articulo.oa?id=213030865001>

- <https://books.google.es/books?hl=es&lr=&id=ijw7DwAAQBAJ&oi=fnd&pg=PT4&dq=la+teoría+del+empujón+richard+thaler&ots=23VDUIzjvB&sig=n3bdyDbnarYpOTozJKRO3CMXRAo#v=onepage&q=la+teoría+del+empujón+richard+thaler&f=false>
- Thomas, H. (2012). Sistemas Tecnológicos Sociales y Ciudadanía Socio-Técnica. Innovación, Desarrollo, Democracia. *Culturas Científicas y Alternativas Tecnológicas*, 65–86. <https://www.researchgate.net/publication/331375579>
- World Intellectual property organization. (2021). Global Innovation Index 2021. In *WIPO* (Issue June). https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii_2021.pdf
- Yi, G. (2021). From green entrepreneurial intentions to green entrepreneurial behaviors: the role of university entrepreneurial support and external institutional support. *International Entrepreneurship and Management Journal*, 17(2), 963–979. <https://doi.org/10.1007/S11365-020-00649-Y>
- Zurbriggen, C., & González, M. (2010). *Políticas de Ciencia, Tecnología e Innovación en los países del MERCOSUR*. Centro de Formación para la Integración Regional. <https://idl-bnc-idrc.dspacedirect.org/bitstream/handle/10625/45322/131788.pdf>
- Suryasa, I.W., Sudipa, I.N., Puspani, I.A.M., Netra, I.M. (2019). Translation procedure of happy emotion of english into indonesian in kṛṣṇa text. *Journal of Language Teaching and Research*, 10(4), 738–746
- Suryasa, W. (2019). Historical Religion Dynamics: Phenomenon in Bali Island. *Journal of Advanced Research in Dynamical and Control Systems*, 11(6), 1679-1685.
- Gandamay, I. B. M., Antari, N. W. S., & Strisanti, I. A. S. (2022). The level of community compliance in implementing health protocols to prevent the spread of COVID-19. *International Journal of Health & Medical Sciences*, 5(2), 177-182. <https://doi.org/10.21744/ijhms.v5n2.1897>