



Innovation: an effective strategy for social impact in the Colombian Public University

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Social innovation

Social innovation refers to the co-creation, development and implementation of new ideas and solutions to address social, cultural or environmental needs, with the aim of transforming social relations, so as to promote greater inclusivity and community participation. The concept of social innovation plays a crucial role within Latin America owing to low levels of competitiveness and a lack of social welfare guarantees. Social innovation acts as an engine of change, as distinct from technological and business innovation, which focus on technological advancement and economic value creation, respectively (Martinez-Celorio, 2017).

The United Nations Economic Commission for Latin America and the Caribbean (ECLAC) has been working on the concept of social innovation since 2004, recognizing the transformative potential of this strategy within the region. Social innovation is not a new phenomenon within Latin America. In fact, communities within the region have been generating creative and collaborative solutions to address social problems long before ECLAC and other international institutions put the spotlight on this issue starting in the 2000s.

The history of social innovation within Latin America dates back decades, with examples of community movements, civil society organizations and local governments working together to find answers to social challenges not solved by conventional models. Such initiatives have sought to address a wide range of problems, from poverty and social exclusion to a lack of access to basic services such as health and education.

A distinctive feature of social innovation within Latin America is its focus on community participation. Innovative solutions often emerge from the very community affected by the problem, drawing on local knowledge and the ability to identify and respond to local needs. Such community participation not only increases the effectiveness and sustainability of solutions, but also strengthens the social fabric and fosters a sense of belonging and empowerment among its members.

ECLAC's definition of social innovation reflects this regional reality, recognizing that it involves new forms of management, administration and execution, as well as the introduction of new instruments or tools, all aimed at improving the social and living conditions of the population in general (ECLAC-UN, 2008). This approach places particular emphasis on community participation throughout the process, from the identification of the problem to the implementation and follow-up of solutions.

It is essential to recognize that comprehensive social innovations within Latin America must be not only effective in terms of improving living conditions but also cost-effective when compared to traditional models. Moreover, they must be scalable, sustainable and capable of being converted into long-term public programs and policies.

Social innovations have had a significant impact within Latin America, generating income for vulnerable groups such as farmers in Haiti, increasing enrollment rates and reducing dropout rates in remote areas such as northern Potosi in Bolivia, and reducing maternal mortality rates, even in rural areas of northeastern Brazil. They have also contributed to raising the visibility of domestic violence within the Peruvian Andean territory, thanks to the work of community advocates trained to support their neighbors.

In the context of the Universidad Nacional de Colombia, social innovation has become a fundamental pillar in the search for solutions to the most pressing challenges facing society. Since the 1990s, the University has embraced the methodology of participatory action research (PAR) as an effective way to address these challenges in a comprehensive and collaborative manner.

The method of intervening in reality for its transformation, known as PAR, has been a significant evolution in the way social problems are addressed (Balcazar, 2003). This approach is not simply limited to the application of academic knowledge, but recognizes the importance of actively involving communities in the identification, analysis and resolution of problems. In the words of Orlando Fals Borda, *“Cómo combinar precisamente lo vivencial con lo racional en estos procesos de cambio radical, constituye la esencia del problema que tenemos entre manos”* [How to precisely combine the experiential with the rational in processes of radical change is the essence of the problem at hand] (Fals-Borda, 1983, p.253). Within this participatory context, communities cease to be considered as objects of study and become key actors in the generation of knowledge.

From its beginnings in the 1970s, with research carried out into the practices of farmers, and indigenous and Afro communities, PAR has gradually evolved to become a fundamental approach in social research. By the 1990s, it had permeated deeply into the institutional culture of the University. This approach – PAR – recognizes local and experiential knowledge as being an invaluable source of wisdom for the generation of sustainable and contextually relevant solutions.

The University is firmly committed to the promotion of this practice that goes beyond the mere generation of knowledge to focus on significant social transformation. Through PAR, a dynamic of collaboration and co-creation is established between academia and civil society, whereby the needs and aspirations of communities are a valued starting point for innovation. One of the main challenges of PRA is that it may take time to establish the necessary trust between academia and civil society before collaboration can be initiated and co-creation leading to social transformation begun. Trust requires time and the financial resources necessary to guarantee the initial work on the ground, which can sometimes be a constraint, if adequate funding is unavailable for initial activities to take place within the PRA process.

In addition to seeking to solve concrete problems, the University’s main objective is to empower communities and promote a culture of citizen participation. This implies not only providing solutions from academia, but also working closely with communities to strengthen capacities and leadership in solving local problems. In this sense, PAR becomes a powerful tool for the development of innovative and sustainable solutions, but also a means to strengthen the ties between academia and society.

The experience of the Ñame [Yam] group at the Biotechnology Institute of the Universidad Nacional (IBUN [Spanish acronym]) exemplifies the potential and the effectiveness of social innovation within academia. By working closely with local communities, the Ñame group has not only developed technical and sustainable solutions to specific problems, but also strengthened community ties, fostered social inclusion and generated a palpable positive impact on people’s lives. This experience illustrates how the Universidad Nacional de Colombia articulates with state institutions, cooperation agencies, companies and communities in order to configure a model of social innovation that transcends academic boundaries and transforms the country’s social reality.

The research group dedicated to the study of the vegetable yam in Colombia was founded in 1997 as part of the Agricultural Biotechnology Program sponsored by the Netherlands Ministry of Foreign Affairs. Its focus on yam, along with other crops such as cassava and plantain, stands out as an area that has been little explored either nationally or internationally. Collaboration with producers on the Atlantic coast introduced participatory research into yam cultivation, a milestone in the country's social innovation. This is aligned with a vision of improving the living conditions of small producers through the integration of biotechnology (Buitrago Hurtado *et al.*, 2017).

The creation of Local Participatory Groups in collaboration with the community allowed the establishment of clear research objectives for the group, focusing on seed quality and control of anthracnose, the main disease affecting crop farming in Colombia. Research advances were shared with program participants, generating ownership and awareness, which accelerated knowledge transfer and plot implementation. In 2000, the research group was formalized by institutions such as COLCIENCIAS [Administrative Department of Science, Technology and Innovation] and the Ministerio de Agricultura y Desarrollo Rural [Ministry of Agriculture and Rural Development], making it possible to link national and international resources in the characterization of the crop and to address the phytopathological challenges using biotechnology.

This participatory approach has been enriched by collaborations at both national and international level, thus broadening the scope and depth of research. This collaboration has resulted in a national and international network that drives research, knowledge transfer and technology adoption. This network includes institutions such as IITA, the University of Frankfurt, CIRAD, the Instituto de Biotecnología de las Plantas de Cuba [Institute of Plant Biotechnology of Cuba], CORPOICA [Colombian Agricultural Research Corporation], several Colombian universities, and CIAT [International Center for Tropical Agriculture].

The impact of this social innovation is evident in yam production, which has undergone a remarkable increase in terms of area under cultivation and yield per hectare. Yam production in 2022 stood at over 402,000 tons, up from 28000 tons in 1990, marking a fourteen-fold increase over this period. The area under cultivation expanded from 4500 hectares in 1990 to over 34000 hectares in 2022. In addition, the number of smallholder families involved has increased significantly, from approximately 5,000 to more than 35,000 in the same period. This growth implies continuous support from the University to strengthen the associative processes among communities, ensuring an effective link with academia, the State, and export companies. It is worth highlighting the alignment of local, national and international actors in the innovation system with the common purpose of generating social welfare and economic benefits for yam-producing communities.

In addition to the experience of the Ñame group, the Universidad Nacional de Colombia has led several social innovation projects that have had a considerable impact in different regions of the country. These projects cover a wide range of areas, from the use of renewable energies in isolated rural communities to environmental education programs in rural schools, recycling, reforestation and human health, among others. This innovation ecosystem has promoted local autonomy and the development of technical and organizational capacities among communities, ensuring that solutions are tailored to specific needs and sustainable in the long term. The identification of strategies to ensure local autonomy, with the participation of different academic disciplines and communities, constitutes one of the areas that merit future work.

The Universidad Nacional de Colombia is positioned as a key player in the promotion of positive social change, demonstrating that knowledge generated from academia can be a powerful tool in building a more just, inclusive and equitable society.

Innovation ecosystem

The Universidad Nacional de Colombia has established and strengthened an innovation ecosystem that not only drives the creation of knowledge through research and technological development, but also actively promotes the generation of knowledge for the benefit of the territories of deep Colombia. This approach is materialized through the participation of communities and their associativity, as the University learns and transforms itself in defense of the public sphere.

This ecosystem – known as ITEM (Spanish acronym) for innovation, knowledge transfer and entrepreneurship – is the result of a continuous evolution within academic and research processes. It has been configured as an inter-site model designed to contribute to the social and economic development of the country. ITEM encompasses the initiatives coming from the University's nine sites, which are materialized in laboratories, innovation units, and support structures for entrepreneurship. These activities are carried out in the 22 faculties, 29 centers and 30 research institutes, thus facilitating the exchange of resources and knowledge, with the aim of strengthening innovation, knowledge transfer and entrepreneurship. This is done taking into consideration the dynamics, needs and interaction with the regional environment.

The innovation ecosystem of the Universidad Nacional de Colombia stands out for its integrative approach that is both interdisciplinary and collaborative. This sees students, academics, researchers and diverse social actors come together to co-create innovative solutions to complex problems. The participation of the university community and the connection with external stakeholders, such as state institutions, the private sector, organized communities and international cooperation, are essential elements within this ecosystem.

A fundamental characteristic of the University's innovation ecosystem is its capacity to articulate projects that address effectively the real needs of communities. This is achieved through calls for proposals and programs that encourage student and faculty participation in applied research and technological development projects. In addition, initiatives are promoted that seek to transfer the knowledge generated at the University to society at large. Given that the University has a student community of 60,000 people drawn from all corners of the country, there is a vast field of social problems that, through the process of training and knowledge management, can become solutions for the communities and territories of origin of the student body.

The impact of this ecosystem is reflected not only in the scientific and technological advances achieved, but also in the strengthening of communities, the improvement of public policies and the promotion of the social economy. The Universidad Nacional is positioned as a key player in the promotion of social innovation within Colombia, contributing significantly to the sustainable development of the country and nation-building.

Significant university and societal experiences

The experience of the Institute of Biotechnology of the National University (IBUN) is an outstanding example of how social innovation and biotechnology can effectively drive rural development. Working in collaboration with local communities, IBUN has developed sustainable technical solutions that not only address specific problems, but also strengthen community ties, foster social inclusion and generate a positive impact on people's lives. This approach exemplifies how academic institutions can collaborate with diverse actors, including state entities, cooperative organizations, and businesses, to promote social innovation and transform a country's social reality.

The combination of biotechnology with strategic alliances, PAR approaches and interdisciplinary work has been fundamental to improving the quality of life of small producers in Colombia. Through the implementation of technologies applied to agricultural biotechnology and the creation of knowledge networks, it has been possible to standardize processes and increase production while improving its quality. The exchange of experiences and the promotion of quality plant material have contributed to the strengthening of infrastructure and the reappropriation of traditional knowledge in rural communities.

Given the outstanding success of the research methodology implemented by the Ñame group, the demand for similar experiences has intensified at both the national and community level. Aware of this need, the University, through its nine sites throughout the country, regularly organizes meetings and workshops in collaboration with communities, companies and state institutions within the different territories. These events become spaces for dialogue where common problems and challenges requiring collaborative interventions and solutions are identified.

Based on the results of this dialogue, the University organizes annual calls for solidarity outreach, with the purpose of involving its entire research ecosystem. This ecosystem is composed of 955 research groups, 55 research institutes and 27 think tanks, each with its own areas of expertise and perspectives. These calls are designed to enable these diverse actors to develop intervention initiatives aimed at addressing the problems identified, using their knowledge and resources to generate effective solutions and thus contribute to the betterment of society.

In the last decade alone, the University has developed 651 projects of this type, involving at least 217 groupings, including farmers, ethnic groups and women's organizations, among others. Such efforts demonstrate that it is possible to contribute significantly to a country such as Colombia's development through science, technology and innovation. By improving the competitiveness of small producers, positively impacting the environment and generating wealth and social welfare, a path is being established toward a more prosperous and sustainable future for all Colombians.

The innovation ecosystem encompasses three fundamental dimensions: technological, social and entrepreneurial that are developed in three key stages. In the initial stage, the focus is on design and initiation, where technological tools are employed and scientific capabilities strengthened, while promoting the enhancement of the social and organizational capacities within communities, with the objective of establishing profitable and sustainable solutions. In the second stage of expansion and strengthening, a specific technological innovation model is developed for the communities involved, training provided in organizational and pedagogical competencies, and social and community processes strengthened through inter-institutional support networks. Finally, in the third stage of consolidation and permanence, the appropriation of the technological and scientific model by the communities involved is sought, the participatory monitoring and evaluation system systematized and socialized, and business, environmental and social sustainability promoted.

Table 1 Innovation ecosystem matrix

	Technological	Social innovation	Entrepreneurial
Stage I: Design and initiation	Technological tools and scientific capabilities	Strengthening of social and organizational capacities of communities	Establishing cost-effective and sustainable solutions
Stage II: Expansion and strengthening	Development of a technological innovation model for communities	Training in organizational and pedagogical skills	Strengthen social and community processes with inter-institutional support networks
Stage III: Consolidation and permanence	Appropriation of the technological and scientific model by communities	Systematization and socialization of the participatory monitoring and evaluation system	Business, environmental and social sustainability

Source: Author's elaboration.

The Universidad Nacional de Colombia stands out for its comprehensive approach that merges technological innovation with social innovation. This integration is materialized through the active participation of communities and the promotion of interdisciplinary work. By joining forces, they together face complex challenges present in different territories. One of the main objectives is to improve the quality of life of small producers, who face significant obstacles in the course of daily activities. This collaborative and real social impact-oriented approach demonstrates the University's commitment to sustainable development and the positive transformation of local communities.

Conclusion

Social innovation in Colombia faces several significant challenges. These range from the financial sustainability of projects to resistance rooted in traditional structures, as well as a need to scale effective solutions. The Universidad Nacional de Colombia has emerged as a key social innovation player, owing to its ability to overcome such obstacles by seeking the necessary internal and external resources to ensure financial sustainability, and by identifying collaborative and convergence models in order to dissipate initial resistance and build trust, a process in which communities are the key players. Its focus on participation and co-creation with the various relevant social and institutional stakeholders has enabled the development of solutions that are not only effective, but also sustainable over the long term.

The success of the initiatives undertaken by the Universidad Nacional de Colombia lies not only in what has been achieved, but in the University's ability to first confront and then overcome challenges along the way. The Universidad Nacional de Colombia has developed an innovative approach that not only recognizes challenges but turns them into opportunities for growth and lasting transformation.

This approach is based on the PAR methodology, which places the community at the heart of the development process. In the initial stage, known as design and initiation, it is the community members themselves who identify the research objectives and needs. This participation ensures that initiatives are aligned with the real needs of the communities they serve and strengthens the sense of ownership and commitment to improving the material reality on the ground.

Once the objectives have been established, the University partners with strategic allies to expand and strengthen the capabilities needed to carry out the research and implement solutions. This collaboration goes beyond simply financial support; it involves knowledge sharing, networking and access to additional resources that enrich the process and increase the likelihood of success. In addition, significant cultural changes have been required for the University to transcend its traditional mission and contribute to national development within the territories in search of peace and inclusion through knowledge management.

This model of integrating technological innovation with social innovation not only addresses current challenges but is also prepared to meet future challenges. In an ever-changing world, where funding challenges and changes in political and cultural structures are inevitable, this approach offers a solid roadmap for sustainable and significant progress. It is a testament to how challenges can become catalysts for positive change, when approached with an adequate mindset and methods.

The challenges facing social innovation in Colombia are multifaceted and require careful attention in order to overcome them. One of the main obstacles is financial sustainability, with innovation projects often dependent upon external funding that may become limited or uncertain in the long term. In addition, the resistance of traditional structures represents another significant challenge, hindering the implementation of new ideas and approaches. Addressing these challenges requires a comprehensive approach that combines the search for more stable and diversified funding sources with the promotion of the type of cultural change that fosters a receptiveness to innovation. It is essential to strengthen collaborative networks between public, private and academic actors to drive innovation more effectively. The creation of policies that foster collaboration and continuous support for innovative initiatives are also key recommendations for promoting an enabling environment for social innovation within Colombia.

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