

Engineer Arcesio Lizcano Peláez

Scientific research, advanced modelling and the formation of a geotechnical school

Research acquires its most enduring dimension when it shapes judgment, creates a school, and prepares others to expand the frontiers of knowledge.

A Stage of Modernization of Colombian Geotechnics

During the first decades of the twenty-first century, Colombian geotechnical engineering substantially expanded its analytical capabilities. The consolidation of numerical modeling, the development of more advanced constitutive models, and the growing connection between experimental research, field observation, and computational simulation changed how the behavior of soils, rocks, and geotechnical works was studied. It is in this context that the career of Engineer Arcesio Lizcano Peláez takes shape, recognized for his emphasis on research, teaching, and rigorous analysis of field problems. His work represents a stage in which Colombian geotechnics strengthened its relationship with mathematical and computational tools, without losing sight of the fact that all modeling must be based on an adequate characterization of the subsoil, on the physical interpretation of the problem, and on engineering judgment.



Photo 19. Portrait of Engineer Arcesio Lizcano Peláez, professor and researcher involved in the development of advanced methodologies for the study of soil behavior.

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The relevance of his contribution is not limited to the incorporation of calculation techniques. His academic work contributed to shaping an approach to geotechnics based on the careful formulation of the problem, the critical selection of hypotheses, the evaluation of uncertainty, and the comparison of numerical results with the observable response of the terrain.

Research and Advanced Modeling

Numerical modelling made it possible to represent, in greater detail, processes that could hardly be addressed using simplified formulations. These include the nonlinear response of geomaterials, soil-structure interaction, the evolution of stresses and deformations, the behavior of cemented materials, and the influence of load paths on the mechanical response.

In geotechnical practice, these tools expanded the possibilities for studying foundations, excavations, retaining structures, tunnels, and stability problems. However, their responsible use requires recognizing that a model does not automatically reproduce reality: it constitutes a representation conditioned by the geometry adopted, the assigned properties, the initial and boundary conditions, and the constitutive model selected.

The academic orientation associated with Lizcano highlighted precisely this relationship between computational capacity and technical judgment. Modeling was meant to be used to better understand the physical phenomenon, explore response mechanisms, and compare scenarios, not to replace subsurface exploration or geotechnical interpretation. In this sense, his work forms part of a disciplinary tradition that combines theory, experimentation, observation, and professional experience.

Research as a Formative Practice

Research occupied a central place in his teaching practice. The academic work carried out under his guidance allowed students at different levels to approach open problems, build conceptual models, and learn to distinguish between observed data, calculation hypotheses, and substantiated conclusions.

This approach had an important consequence: the training process was not limited to transmitting procedures. He sought to develop intellectual autonomy, critical thinking, and methodological discipline. In geotechnics, where subsurface information is necessarily incomplete and natural variability makes it impossible to reduce problems to single solutions, these competencies are as important as mastery of analytical tools.

The training promoted by Lizcano also encouraged dialogue between scales. Students had to understand the behavior of the material in the laboratory, recognize its expression in the field, and analyze how both levels conditioned the response of a structure. This connection between the test, the model, and construction reality strengthened a comprehensive view of the discipline.

Formation of a Geotechnical School of Thought

Beyond his scientific contributions, one of the most significant legacies of Engineer Arcesio Lizcano Peláez has been the training of new generations of geotechnical engineers. During decades of teaching and research, he directed undergraduate projects and postgraduate theses and supported the academic and professional development of students who went on to work at universities, consulting firms, public entities, and research centers, both in Colombia and abroad.

In this trajectory, teaching appears as an activity inseparable from research. Teaching did not consist only of communicating established knowledge, but of raising questions, demanding consistency in arguments, and promoting an approach to geotechnics based on analysis, innovation, and critical review of results.

The scope of this work can be seen in the multiplier effect of his students. Some went on to pursue academic careers; others worked in applied research, specialized consulting, public management, or the management of complex projects. In all these areas, the influence of the master was reflected in shared practices: rigor in the formulation of problems, responsible use of advanced tools, interest in understanding the physical behavior of the terrain, and commitment to professional quality.

For this reason, it is pertinent to speak of a geotechnical school of thought. It is not a formal structure or a closed doctrine, but a community formed around recognizable academic and technical criteria. Its members have taken these criteria to new institutions, work teams, and generations of students, expanding the scope of the work initially developed in the classroom and in research groups.

The international projection of several of his former alumni also shows that the training they received extended beyond the local sphere. The circulation of researchers and professionals between Colombia, Latin America, North America, and Europe allowed knowledge, questions, and methods developed in the country to be incorporated into broader academic and professional networks.

Students as a Lasting Legacy

Publications, research projects, and analysis methodologies constitute a visible part of an academic career. However, its most lasting effect is found in the people it trained. Every former student who directs research, teaches at a university, leads a project, or proposes an innovative solution prolongs, under new conditions, the intellectual work of his teacher.

In the case of Engineer Arcesio Lizcano Peláez, this legacy acquires special importance because it brings together two complementary dimensions. The first is technical: knowledge about the behavior of materials, modeling, and geotechnical analysis. The second is ethical and formative: rigor, honesty in the face of uncertainty, willingness to critically test results, and responsibility for the consequences of engineering decisions.

This combination explains why students can be considered one of his greatest achievements. The works have a defined useful life, and the methods are updated with the progress of the discipline; a well-trained community of practitioners, on the other hand, can review those methods, create new ones, and pass them on to those who continue. Thus, knowledge ceases to depend exclusively on one person and becomes an academic tradition capable of renewal.

The Legacy of Engineer Arcesio Lizcano Peláez

The contribution of Engineer Arcesio Lizcano Peláez to Colombian geotechnics is understood in the convergence of three fields: scientific research, advanced modeling, and the formation of professionals. His career helped to consolidate an academic practice in which the computational tools are used with a physical basis, the results are subjected to critical review, and the knowledge is transmitted through demanding and sustained mentoring processes.

His legacy lies not only in individual research products, but in having formed a community that continues to develop and apply these principles. Through his students, his influence extends to new research, projects, institutions, and teaching spaces. This generational continuity holds the broadest expression of his contribution: a highly accomplished researcher and, above all, a teacher whose work lives on in the judgment and in the trajectory of those he helped train.