

## CHALLENGES OF AGRIFOOD SYSTEMS IN THE TWENTY-FIRST CENTURY

1. I would like to start by thanking the Academy and you, Mr. President, for this invitation, which I consider a great privilege and a true honor. I am aware that some of the most respected names of our profession have passed through this establishment and are present today. As such, I value this invitation and I associate it with the highest level of professional excellence, for which I am deeply grateful and committed. I will strive to rise to the occasion and do all that I can within my power.
2. From the introductions given by my sponsors, Doctors Lucio Reca and Carlos van Gelderen, I would like to highlight some aspects of my professional career. I started out as a generalist veterinarian with an enthusiasm for issues related to reproduction in large animals, and then worked on opportunities and challenges in tropical animal production. I then moved on to a third stage, the issue of international agricultural policies, before finally becoming involved in the last thirty years in areas of international cooperation, which culminated five years ago with my appointment as Director General of the Inter-American Institute for Cooperation on Agriculture, better known as IICA.
3. Drawing on my experiences in the international field, I would like to share with you some reflections on the current state of agriculture and rural life, on what we are facing at present, and what this offers from the perspective of our profession, based on a global and regional worldview, with a few Argentinian influences.
4. You will probably be familiar with a saying that has become almost a cliché, which is generally used without much reflection and sometimes even jokingly: **the future isn't what it used to be**. Despite the often frivolous use of the phrase, I believe that the statement has never been more relevant than now, especially with regards to our sector.
5. I say this because after a long period in which the issue of agriculture and food was largely associated with the debate over poverty and the search for ways to end rural poverty, we were interrupted by the pandemic. At the same time, the frequency of extreme climate events intensified and, as if this wasn't enough, 14 months ago we witnessed Russia's tragic invasion of Ukraine. This new scenario, this new situation, crudely exposed the fragility and fragmented vision of many components of our agriculture and food security. And simultaneously it put agriculture at the top of the international agenda once again, as happened previously at the end of Second World War, when the world started to mobilize to harness the knowledge of the era, to ensure

the supply of food and of raw materials, seeking to leave behind the hunger, poverty and food insecurity that resulted from the war.

6. Since that time, there have been major advances in agriculture and agrifood systems. In 1945, at the end of the Second World War, the world population was 2.5 billion and undernourishment affected over 40 percent of the people in developing countries. In the nearly 80 years since, the population has tripled and undernourishment affects less than 15 percent. This is a major historic achievement, one in which our profession has played a leading role, and one of which we should be proud.
7. But the future isn't what it used to be, and we are facing enormous changes and challenges that are forcing us to rethink many of the things we previously took for granted, and which to a large extent change the role of agriculture in our society and, consequently, the challenges and opportunities for our profession.
8. The first major issue that we must consider is the relationship between agriculture and the food supply. Since the dawn of time, these issues were virtually inseparable, to the point that human societies became organized when agriculture was invented. Today, the situation has changed.
9. With some exceptions, not very long ago, in historic terms, **we ate what was produced**. The social and technological transformations that have occurred, especially since the Second World War, have disrupted that identity, forcing us to rethink the debate about food.
10. The growing urbanization of society, increased income, changes in the labor market—particularly in terms of the greater participation of women—the expansion of global trade, deregulation and the process of globalization, with its subsequent impact on customs and consumption habits, have led to a system—the agrifood system—which includes a very diverse group of activities and stakeholders with an identity of their own, who interact and determine decisions and behaviors. **What is produced and where and how** must increasingly be defined by **what it is for or whom it is for**, and seen from a more comprehensive perspective. Within this context, there is the growing importance of health and nutrition in our diets and the consequent repercussions on agriculture and its production strategies.
11. This new context no doubt brings with it great opportunities, but also challenges that perhaps have not been considered sufficiently until now.
12. The magnitude of these transformations is clear to see when we analyze how primary agriculture's share in food consumption has changed between 1950 and the present day. According to data from the USA—the only information available over a long period—this figure fell from over 40 percent to just 14.3 percent by 2019.

13. This has been recognized in the international sphere, revealing the need for a more systemic discussion about food. As such, in September 2021 the United Nations Secretary General, António Guterres, convened the World Food Systems Summit, to reach an agreement on strategies and policies to transform and strengthen these systems, in light of these new challenges, particularly to meet the demands of a global population that, by all indications, will continue to grow until the end of this century.
14. The countries of the Americas participated actively in the Summit, reaching a consensus expressed in 16 powerful messages—written and agreed on with IICA’s support—that adopted a position based on recognizing the sustainability of our productive systems and the strategic role that food systems in the Americas play in the economic and social health of our countries and in global food and environmental security.
15. Closely related to this is the issue of climate change, which is a phenomenon that can no longer be ignored, and one that our sector must address from multiple perspectives. First of all, we must recognize that the phenomenon is happening now, in many cases brutally affecting farming activity. There is an urgent need to adapt to this climate crisis, adopting an ecosystemic vision, re-learning new farming techniques and ensuring more comprehensive management of soil and water.
16. Another perspective is to reflect on the degree of responsibility of agrifood systems in the context of an Anthropocene model that is showing clear signs of depletion. Even assuming that agriculture accounts for approximately one third of global emissions, this means, if my calculations are right, that two thirds of the responsibility falls on other sectors of the world economy. This is why we say that the agriculture sector in general, and livestock production in particular, must be seen as part of the solution, not of the problem.
17. We have to see the glass as half-full and rationally and coherently defend the fact that our sector is the only one that can make and is in fact making real contributions to mitigate climate change, by reducing greenhouse gas emissions and promoting carbon sequestration in our soils.
18. Climate-smart agriculture is essential for life, as it provides essential foods for human development, and is quite probably the most effective and best-distributed carbon sink that we have. Once again, we are faced with great opportunities and challenges.
19. Another aspect I want to highlight is how the consolidation of the bioeconomy is offering new ways to harness natural resources, thus furthering the insertion of agriculture into all of society’s needs, building unprecedented bridges between farming and the environment. Here, the main drivers are advances in biology and how it interfaces with the hard sciences, data science, robotics and engineering. All these disruptive technologies help to create a new frontier of knowledge that

offers promising alternatives in light of growing concerns about the degradation of natural resources, the impact of climate change and the need to address renewed demands for food, biomaterials and energy, given the expanding population.

20. There is an increasingly visible new form of economic organization that makes growth—an imperative for developing societies like ours—compatible with the 2030 Sustainable Development Goals. This positioning of agriculture as part of a broader and more complex network of relationships with the other economic sectors has the capacity to drive the transformation of rural territories, generating opportunities for employment, income and development, and promoting the transition towards a more resilient economy that is less dependent on fossil fuels. Once again, there are great opportunities and challenges.
21. Latin America and the Caribbean is the leading net food-exporting region in the world, exceeding the net exports of the USA, Canada, the EU, Australia and New Zealand combined. This is why we can say that we are the guarantors of the planet's food, nutrition and environmental security.
22. I would now like to talk about how I see Argentina in the context of these structural changes. As a major player in the agrifood world, Argentina cannot ignore them. Our country is the tenth largest exporter in the world, and second after Brazil in terms of net exports.
23. We must produce more with less, and more sustainably, by establishing new ties between production and the environment, understanding that we are facing an unbeatable opportunity if we industrialize our agriculture, see our rural areas as areas of opportunities and employment, and build bridges between rural areas and urban centers.
24. We have to realize our aspiration to be **the world's great food supplier**, promoting decent living conditions for our small farmers, and including young people and women along with digital technologies. The growing weight of concerns about nutrition and human health and the environmental impact adds a further complexity and must be incorporated into our short, medium and long-term strategies.
25. Regarding the issue of climate change, as I mentioned before, there is no doubt that we are now feeling the brunt of its most cruel impacts. But our agriculture and livestock systems offer a formidable platform to ensure future sustainable competitiveness, which we must harness.
26. No-till farming and our extensive livestock production are clear examples of technological solutions that have proven effective in terms of their positive impact on carbon emissions. The challenge ahead is how to position these elements in international negotiations, in a scenario in which some wish to paint the agriculture sector as "the bad guys." In this respect, COP27, and more specifically the participation of agriculture in climate talks, was a first step in this direction

and we have to go further. Here, I think that the Academy, along with the other countries' academies, has a critical role to play in providing scientific arguments about the sustainability of our productive systems and the fact that agriculture is unquestionably part of the solution to climate change.

27. Lastly, in terms of the bioeconomy, Argentina was an early adopter and is seen today as a leader in our region. The basis of this was the incorporation of biotechnology into our extensive crop production in the early 1990s and the transformations that followed in the sector. We must also mention what happened in the pharmaceutical sector, with the foot-and-mouth disease vaccine and other innovations, and the fact that the sector has continued to innovate. Argentina has joined the small core of countries that have developed innovations of their own in this sector. The approval of drought-tolerant soybean and wheat are clear proof of the potential of public-private partnership in innovative processes, and also of the existence of the required scientific and institutional business capacities to compete in the world of the bioeconomy.
28. All the changes I have mentioned are creating a new world in a very short period of time. The big issue is that although in some aspects the short term looks turbulent, we have the tools to address the challenges we face.
29. In this regard, and for countries like ours that are rich in biological resources, it is particularly fitting to quote Steve Jobs. On introducing one of the first versions of the iPhone, he predicted that the twenty-first century would be the century of biology and information. What is happening in the world, and the things that are happening in Argentina that I've mentioned, are clear proof that he wasn't wrong.
30. The new world is the world of knowledge, and to compete in it we have to invest in R&D. Our region invests little in this respect. Only Brazil invests slightly more than 1 percent of its GDP in S&T, compared to the 3 percent that Israel invests. The rest of the countries in the region, including Argentina, invest 0.5 percent of GDP. All of this is aggravated by the fact that most investment comes from the public sector, while in the rest of the world an increasing proportion— in some cases most of the investment—comes from the private sector, giving the process a very particular dynamic appropriate for these times.
31. To conclude, I want to tell you that the R&D investment gap is one of the issues that I am tackling vigorously in my capacity as IICA Director General. Our concern is that the lack of investment reflects a lack of perspective and states policies in terms of the role of S&T. We are convinced that the transformation we want to bring about will depend on having the capacity to manage the tools of modern science and technology effectively and for our benefit. Here I believe that the Academy can make a great contribution by drawing attention to the subject, not only at the level of our country, but also at the regional level. In this regard, I offer IICA's institutional commitment to work with other academies in the region on a number of activities that will allow us to drive a hemispheric science and innovation program, bearing in mind the challenges and opportunities

that lie ahead. When I arrived at IICA, I implemented the Interpretive Center for Tomorrow's Agriculture (CIMAG) and I believe that from there, in conjunction with the academies of other countries, we can lead the debate that is needed to make these transformations a reality.

32. To sum up, the current scenario and the harnessing of the available opportunities must prompt us to work together—the Academy, the public and private sector and organized civil society—to reposition and give a new dimension to science and technology, facilitating access to the new frontier of knowledge, to make it possible to move towards full agricultural and rural development, fully incorporating the dimensions of environmental sustainability and social inclusion. This will require inter-cooperation and South-South cooperation at all levels, led by a focus on innovation and science and technology.
33. Once again, thank you for the honor of inviting me to be part of this esteemed forum. I reiterate my promise to work to live up to its high standards.
34. Thank you very much.