

Celebrating RUFORUM@10

Tertiary education: a prerequisite to meet global challenges

Innovation is considered to be crucial for addressing societal and economic challenges and opportunities in the agro-food domain. This calls for high-level educated employees, for which tertiary education is crucial. Since system innovations will gain impact, tertiary education increasingly needs to embrace the development of interdisciplinary skills. Wageningen UR meets these needs by the T-shaped skills approach, indicating that each specialist is able to connect with specialists from other disciplines. Wageningen UR is committed to assist third parties in developing and implementing similar models.

Despite its tiny size, The Netherlands is the second-largest exporter of agro-food products in the world. The sector contributes 10% to the GDP, accounts for 20% of the export and employs 600.000 people in the country. It illustrates that the agro-food domain is a major driver of the Dutch economy. The key-word for the Dutch position is innovation. Developing, sharing and combining knowledge opens continually avenues for new developments, yielding new and better products, more efficient production methods, new institutions and new arrangements. Boosted after the Second World War, this innovation helped the Netherlands to build its leading position. At that time, the Research-Education-Extension model was introduced to stimulate innovation. Dedicated National Agricultural Research Institutes, together with Universities and Extension Services developed new knowledge and educated the end-users on how to implement it. However, the linear model eroded at the turn of the century. As a result of the model, end-users became increasingly educated and were not satisfied with only consuming knowledge anymore. Considering that end-users were the experts, a new interactive model was developed, leading to the concept of co-innovation. Facilitated by the government, end-users from industry and society now sit



Above: Prof. Dr. Martin Kropff Rector: Magnificus of Wageningen University and Vice-President WUR

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together with scientists to articulate the scientific needs, to jointly carry out the research, and to facilitate implementing innovations. This model, often referred to as the Golden Triangle or Triple Helix, serves us well and is at the basis of the Dutch economic innovation policy. One of the consequences is that public extension services virtually disappeared in the Netherlands, as intermediates between end-users and research are less relevant when the end-users interact directly with the research community. Wageningen UR responded to the new opportunities by developing a campus eco-system, attracting companies and organizations related to agro-food R&D to settle at the campus. The rationale is that meeting and greeting will stimulate co-innovation, to the benefit of all parties.

Innovations are often perceived to be linked to the technology domain. New products, new technologies and new processes are often considered to be main factors for innovation. Yet a successful implementation of technologies requires a conducive enabling environment where a 'hierarchy' of innovation is at place and more focus is put on the system innovation, including the societal elements (social innovation) rather than the technology itself. Therefore social innovations are as important as technological innovations, and a combination of socio-economics and technology is needed to implement innovations. Genetically Modified Organisms, for example, is based on edge-cutting technological research, but will only be implemented when it serves the needs of economy and society. So interdisciplinary research is needed, and the gap between different scientific domains needs to be bridged.

Although the Dutch agro-food sector is a major driver of the economy, the number of students of Wageningen UR decreased drastically at the turn of the century, even when jobs were guaranteed. Agriculture was not considered a 'sexy' sector. Over the last decade, however, student numbers increased with 10-20% per year. This is ascribed to two factors. First, the agro-food domain came back on the international agenda. While for a long time agriculture was associated with farmers only, it by-and-by became evident that the agro-food sector is a key player in addressing the large societal issues the world is facing today. Evidently, the sector drives nutrition security, but also the upcoming bio-economy, the care for scarce resources, our threatened biodiversity, adaptation to and mitigation of climate change and preventing diseases are nowadays all attributed to the agro-food domain. Being active in this domain is addressing global challenges, and contributing to solutions that the world needs. In addition, Wageningen UR decided to emphasize the role of man in the agro-food domain. In the end, it is not science that counts, but the life and livelihood of people. We need science with impact, and we want to contribute to the quality of life. It has resulted in the sound and international student community that Wageningen UR has today.

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The above relates to tertiary education in several ways if we want to accomplish innovation. First, we need to educate our student in an interdisciplinary way. We call this ‘the Wageningen approach’, where we don’t deliver pure specialists or generalists, but stimulate T-shaped skills indicating that each specialist is able to connect with specialists from other disciplines. Second, tertiary education cannot exist in splendid isolation. Interaction is needed with all relevant stakeholders (e.g. education institutes, producers, industry, end-users). We need to educate our students to enable them to interact with all these stakeholders and make them sensitive to use indigenous knowledge from stakeholders (i.e. a more transdisciplinary approach). In other words, we need to stimulate them to be inspired by society, and develop and use their skills to address societal issues. In all, we need to teach our students to appreciate different approaches, and move beyond their own perception. We need to stimulate them to enter dialogues rather than debates, where they feel safe to doubt their own truth. Finally, we must keep emphasizing that tertiary education in the agro-food domain in a broad sense is essential to meet the challenges the world is facing. We need to appreciate the domain, and show our students that they do matter. It will stimulate our students to develop into responsible scientists dedicated to use their knowledge to improve the quality of life.

Given that the agro-food sector in Africa is confronted with a set of diverse challenges, the principles described above may certainly contribute to tackle these, particularly those related to capacity building. Making the agro-food domain attractive by illustrating that it forms the basis of solving many social and economic issues is an important asset that attracts students. When accordingly the curriculum is based on inter- and/or transdisciplinary approaches the students adopt skills that make them optimally prepared to participate in society, be it in the scientific, the governmental, the non-governmental or the industry domain. Curricula embracing interdisciplinarity will also help to address challenges in a balanced way and will create understanding for other approaches, allowing innovations to become accepted and embedded in society.

Wageningen UR is dedicated to assist in this process of curriculum development and capacity building, and the so-called Niche programs of the Dutch embassy are instrumental in this support. Hereby we do not only rely on the expertise but certainly also on the long history that Wageningen UR has with Africa. For decades, African students have obtained MSc and PhD degrees at Wageningen University, and their number has increased over time. Many African PhD candidates fall under the category of Sandwich PhD which implies that the candidate does the research in the country of origin and is supervised by African and Dutch supervisors who take jointly responsibility for the education and graduation of PhD candidates. Furthermore, Wageningen offers an array of short tailored-made courses for local partners to educate targeted groups on targeted topics. A clear exam-

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ple is the current AGRA-Wageningen UR capacity building program in the field of Soil Health. This program taps in on the Wageningen UR knowledge and expertise regarding PhD research and training, focusing on academic content and expertise as well as on skills related to optimization of the research process and its quality. Another example is the CASCAPE Program where we closely collaborate with our Ethiopian counterparts to up-scale best practices in research, training and education under the umbrella of the national Agricultural Growth Program.

Besides the currently running programs we intend to increase our long-term collaboration with African partners. For one, we will be doing this with current partners such as AGRA with whom Wageningen UR intends to develop longer-term research, training and education programs taking on board the innovative approaches in research and training at all levels along the agricultural value chain. Furthermore, we hope to materialize the collaboration by a large joint partnership initiative that we started together with our colleagues from CIRAD and FARA. This so-called IntensAfrica initiative is anticipated to form the base for a long-term and large scale collaboration in the field of research, education and innovation, addressing the societal challenge Nutrition Security. It aims at engage with stakeholders including the private sector and to work in an interdisciplinary way. So IntensAfrica encompasses all the principles referred to above, and we hope that this initiative will fly to enable aligning forces to capitalize on the promise of African Agriculture.

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This is our seventh issue in a series of articles we are releasing as part of our 10 year anniversary. Download by clicking on the following issues to access the previous issues; [Community Action Research Grants: Connecting Universities to Rural Producers](#) (sixth issue) [RUFORUM Small Competitive Grants; GRGs – Graduate Research Grants](#) (fifth issue) [RUFORUM Network: Changing Pedagogical Paradigms, Priorities, and Practice](#) (fourth issue), [Briefing note on the 4th biennial conference](#) (third issue), [RUFORUM's Developmental Roots](#) (second issue) and [RUFORUM@10](#) (first issue).

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