POLICY BRIEF

A summary for decision making of key research findings

Towards a research impacts model to foster university-industry links

Sultan Qaboos University

College of Agricultural and Marine Sciences
Department of Natural Resource Economics

CAMS Policy Brief
January 2022

Summary

"Research-innovation is essential in the fields of natural resources, agriculture and food to achieve sustainable food security and economic growth. This can be implemented through a research-innovation model taking into account the different dimensions of innovation, mainly technical, political and social, and building the missing links between science and industry."

The impacts of a project require the development of a "logical-framework"; a series of "if-then" statements describing the path from engaged inputs/activities to outputs and desired outcomes. In research, inputs are initial resources put into the process; then research (realized activities and results) is published in journals (outputs). Journal articles are read by practitioners and decision makers (primary outcome). These users implement a change (intermediate outcome); and a change leads to improvement in the target population (long-term outcome or impact).

The outcome-impacts framework is particularly important in the changing paradigm of university-industry relations; in the pursuit of public funding with stringent conditions the university is concerned about economic and social impacts. The university produces knowledge, new ideas, and inventions, which are ingredients of innovation; impacts are sought by business incubation and technology commercialization to boost innovation. The research-innovation model is also concerned with other dimensions of innovation. The dimensions in question include social, economic, policy, and institutional aspects which stem from the nature of innovation.

Key messages

- ***The current research-innovation model at CAMS-SQU is an output-based model.***
- ***Although most funding is public, the first target of research is capacity building and publications.***
- ***Innovation and impacts should be included beforehand in the design of the research project.***
- ***The conditions for research outcome-impacts require an understanding of the nature of innovation, and are met with more collaboration among researchers in different fields.***
- ***The degree of adoption of research outputs is associated to miss linkages that need to be re-established in order to improve the innovative performance of research.***
- ***The improved system would capitalize on the generated knowledge focusing on entrepreneurial activities such as incubations, spinoffs, and science parks.***

Background

The input, output, outcome-impact framework is a tool to improve impact assessment. It is particularly important in the changing paradigm of university-industry relations; public funding requires accountability, and universities are therefore concerned about economic and social impacts.

The research-innovation process face some pitfalls related to gaps between research outputs and outcomes that can be addressed by placing stronger emphasis on academic engagement and commercialization of knowledge. This could be done if universities changed the way research is done, outcomes are protected, and scientists are geared toward these paradigm imperatives. Closing the outcome-impact gap also requires dialogue between scientists and economists to unify knowledge and develop new tools accountable to society and better suited to set research priorities.

University-industry relationship has changed from research alliances to innovation centered collaboration with academics being more involved in commercialization of their research outputs.

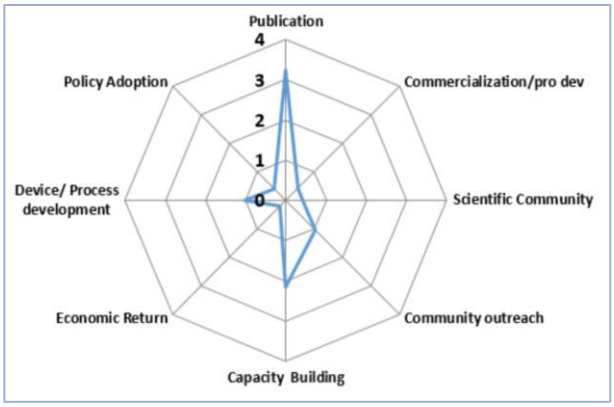
Method

Results in this brief are derived from a project which used a sample of projects conducted at CAMS in the different fields of agriculture and food. The aim was to identify the research innovation process and to assess the impacts using clustering techniques. The resulting model of research-innovation displays the various stages of research innovation where engagement, advocacy and achievement are investigated. The gap between outputs and outcomes of research reflects the effectiveness of the research.

Key findings

Research efficacy criteria:

Figure 1 shows the research efficacy of the selected research projects, based on intended objectives and outcomes: capacity building (37%), capacity and process development (28%), community outreach (14%), growth and welfare (14%) and commercialization (5.7%) The highest criterion according to these results is publication (scientific community), followed by capacity building (students). All others are rated very low.



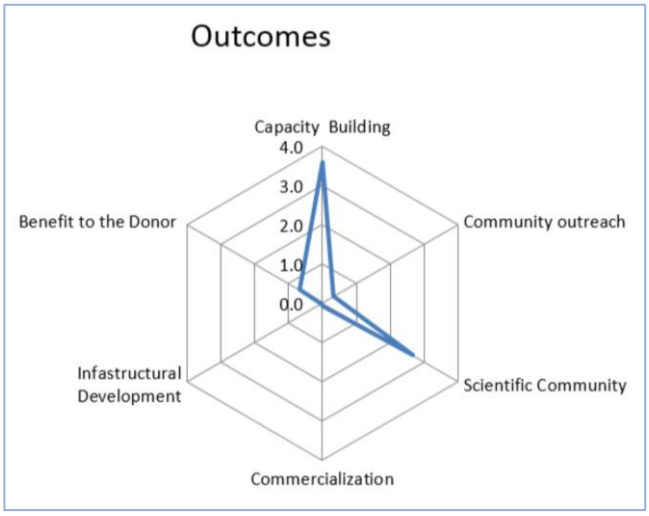


Figure 1: Research efficacy criteria and level: Research objectives (above) and outcomes (below)

Figure 2 shows a slight change in the key criteria when introducing the term “impact of research”. Overall assessment (CAMS average) of impacts is very low (below 1.5). These values, however, differ from one field to the other; Natural resource economics (NREC) indicated the highest impact for ‘policy adoption’, whereas food science indicated ‘scientific community and product development’. Although most grants are public (internal grants and strategic funds) benefits show that the least targeted are farmers and industry; public sector comes 3rd. The first target is ‘students and the scientific community’.

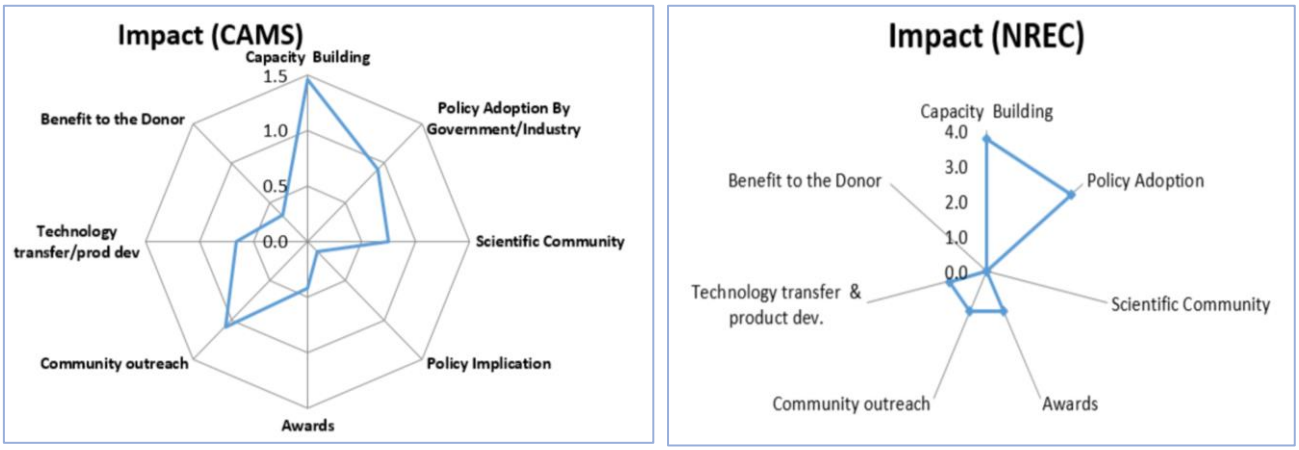


Figure 2: Impact assessment of research: College (right) and NREC (left)

The research-innovation ecosystem:

The improved system would capitalize on the generated knowledge focusing on entrepreneurial activities such as incubations, spinoffs, and science parks. The research-innovation ecosystem in Figure 3 is constructed by mapping the current innovation system and understanding of the links as designed by our methodology and investigation.

Figure 3 shows a revised map displaying actors, links, and roles which would improve the current system, based on the (missing) links, conditions (requisites), and actual research-innovation mapping.

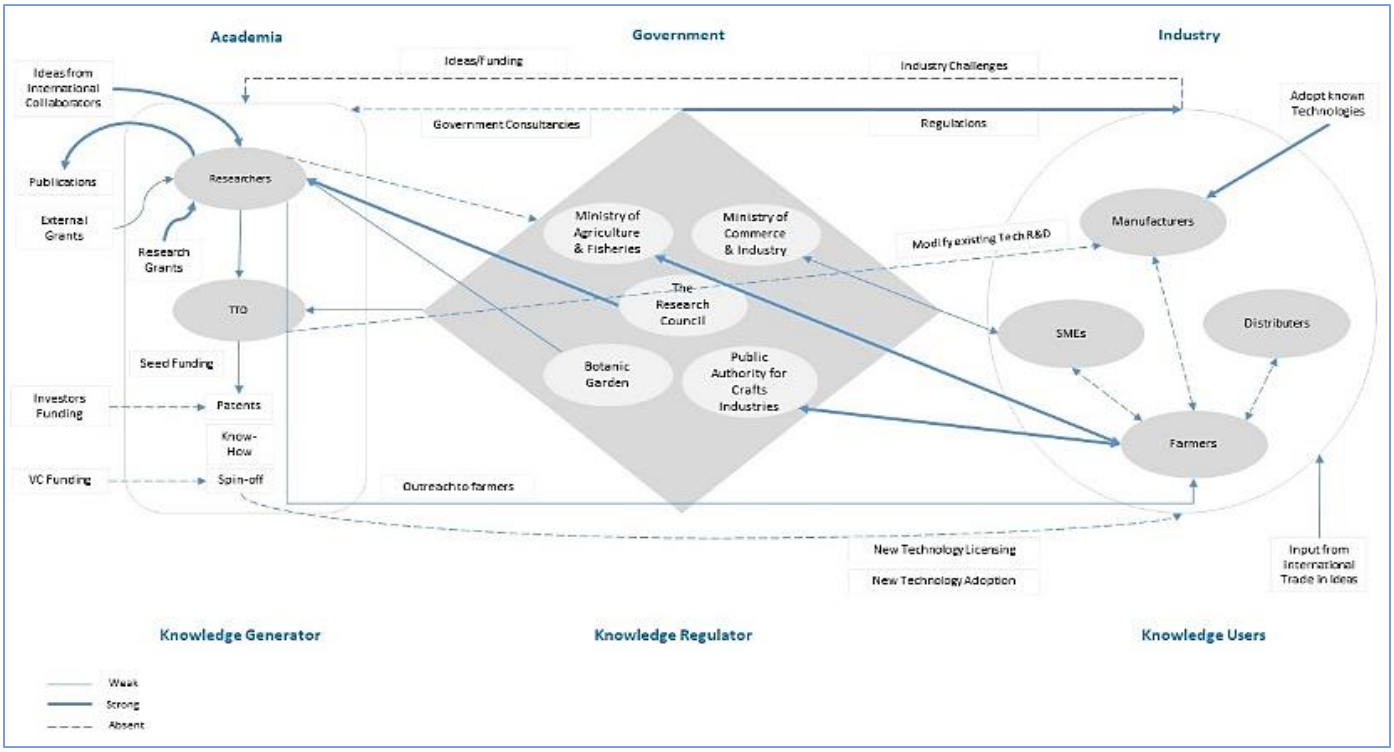


Figure 3: A platform for research innovation

Conclusions

The current research-innovation model at CAMS-SQU could be qualified as an output-based model. The overall impact is quite low. Our research aims to find the missing links in the output-outcome-impact model. Such links are deemed to improve the performance of the overall innovation process and system. There are conditions, as stated by interviewers, to improve the innovative performance of university research including: funding and international collaboration, research-industry/policy making platforms, infrastructure, and institutional/regulations development. The innovative performance would come from changes all along the value chain: changes in the nature of inputs, activities, outputs, outcomes, and impact indicators.

Acknowledgment

This project has been funded by the research internal grant in 2018 and results published in the Asian Journal of Empirical Research, Vol 9, Issue 11, 2019.

For more information Contact the authors:

Lokman Zaibet, Tarig Gibreel, Sheikha Al Akhzami, Rachid Hedjam, Houcine Boughanmi

Department of Natural Resource Economics

College of Agriculture and Marine Sciences

Sultan Qaboos University

Contact address: lzaibet@squ.edu.om