2012:6 Sida Evaluation

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Evaluation of Sida's Support to Innovation Systems and Clusters, a Research Cooperation Initiative

Individual cases

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Table of Contents

Abbreviations

ATPS	African Technology Policy Studies
AU	African Union
AUC	African Union Commission
BCHCI	Bagamoyo Cultural Heritage Tourism Cluster Initiative
BecA	Biosciences Eastern and Central Africa
BIO-EARN	East African Regional Programme and Research Network for Biotechnology
Bio-Innovate	Bio-resources Innovations Network
BOP	Bottom of the Pyramid
CACONIC	Nicaraguan Chamber of Commerce
CADEPIA	Cámara Departamental de la Pequeña Industria y Artesania Productiva de Cochabamba
CCP	Cluster Competitiveness Program
CI	Cluster Initiatives
CNPq	Conselho Nacional de Desenvolvimento Científico e Tecnológico Brazil
CNU	Consejo Nacional de Universidades
CoET	The College of Engineering and Technology at the University of Dar es Salaam
CONICYT	Council of Science and Technology Nicaragua
COSTECH	Tanzania Commission for Science and Technology
DANIDA	Danish International Development Assistance
DFID	Department For International Development, United Kingdom
DICYT	Dirección de Investigación Cientifica y Technológica at UMSS
FORSK	Sida's Unit for Research Cooperation
Globelics	Global Network for Economics of Learning, Innovation and Competence building
ICT	Information and Communications Technology
IDA	International Development Association
IDRC	International Development Centre
ILRI	International Livestock Research Institute
IMS	Institute of Marine Sciences Zanzibar
IPR	Intellectual Property Rights
IS	Innovation System

ISCP-EA	Innovation Systems and Clusters Program for Eastern Africa
IUCEA	Inter University Council of East Africa
IUP	Innovative University Program
M&E	Monitoring and Evaluation
MECI	Metal works and Engineering – Morogoro
NAADS	National Agricultural Advisory Services
NARO	National Agricultural Research Organization Uganda
NEPAD	New Partnership for Africa's Development
NGO	Non Governmental Organization
NIS	National Innovation Systems
OECD	Organisation for Economic Co-operation and Development
PACF	The Pan-African Competitiveness Forum
PSCP	Private Sector Competitiveness Project
R4D	Research for Development
RMRDC	Raw Materials Research and Development Council
SAREC	Sida Department for Research Cooperation (name used to 2008)
SEI	Stockholm Environmental Institute
SEK	Swedish Kronor
SICD	Scandinavian Institute for Competitiveness and Development
SIDO	Small Industries Development Organization, Tanzania
SME	Small and Medium Sized Enterprises
SNV	SNV Netherlands Development Organisation
TACRI	Tanzania Coffee Research Institute
TCCIA	Tanzania Chamber of Commerce, Industry and Agriculture
TCI	The Competitiveness Institute
TDFA	Tanzania Drug and Food Authority
TDTC	Technology Development and Transfer Centre
TIAS	Technical Innovation and Applied Research Scheme
TPSF	Tanzania Private Sector Foundation
TWAN	Tanga Women Artists Network
TZS	Tanzania Shilling
UDSM	University of Dar es Salaam
UEM	University Eduardo Mondlane, Mozambique
UIRI	Uganda Industrial Research Institute
UMSA	University of San Andres
UMSS	Universidad Mayor de San Simon (UMSS)
UNCTAD	United Nations Conference on Trade and Development

UNESCO	United Nations Educational Scientific and Cultural Organization
UniDev	Developing Universities Research Network
USD	US Dollar
UTT	Unit of Technological Transfer at UMSS
VicRes	Lake Victoria Research
VINNOVA	Swedish Governmental Agency for Innovation Systems
WWF	World Wildlife Fund
ZaSCI	Zanzibar Seaweed Cluster Initiative

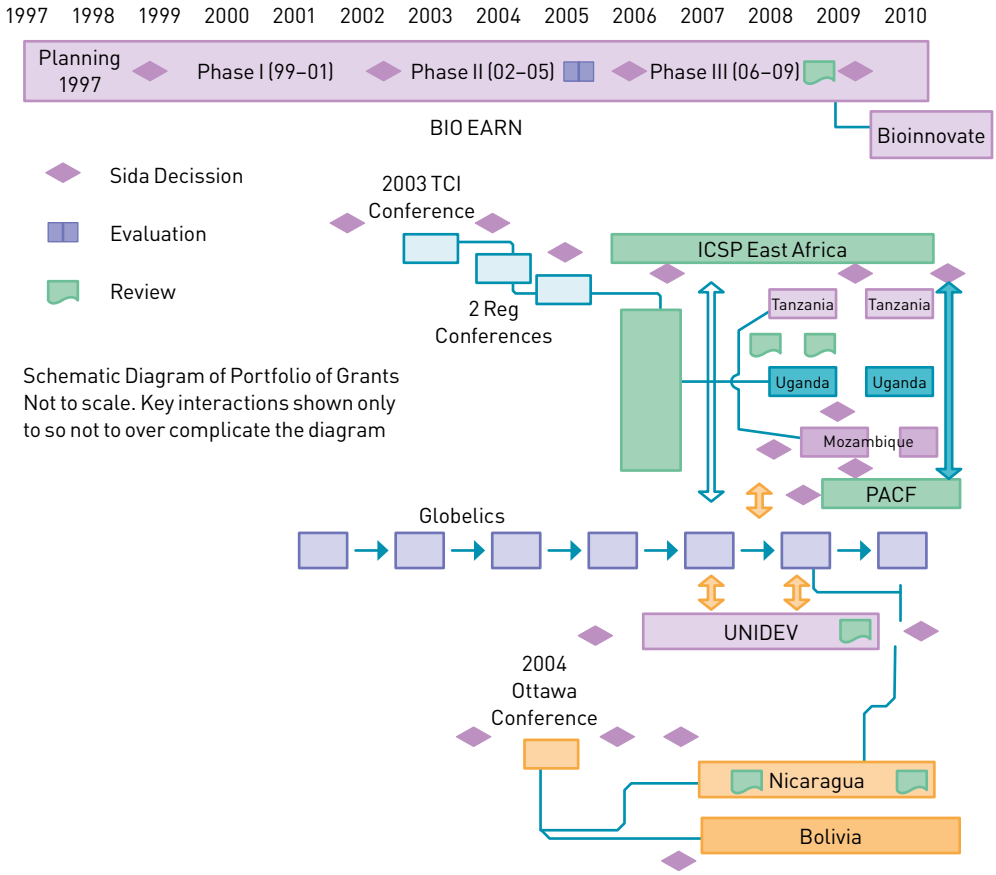
1 Introduction

This is the second volume of a strategic evaluation commissioned by Sida to investigate a portfolio of innovation related contributions in its research cooperation. The main purpose of this evaluation is to generate knowledge from results from the selected portfolio of support to innovation systems and clusters undertaken in Sida's research cooperation. The aim is to provide lessons learnt to the Unit for Research Cooperation as well as Sida more broadly, on how to best work with research in relation to innovation systems and cluster initiatives in the future. The evaluation is strategic in nature in that it asks evaluative questions about the portfolio of contributions to assess it as a collection of "ways of working" for Sida, rather than evaluating the results of each contribution per se. See Volume I for further details on background, purpose and Terms of Reference for the evaluation.

The portfolio consists of ten distinct programs (some with sub programs) that have received support from the Unit for Research Cooperation between 2001 and 2010. A schematic sketch is shown in Figure 1. The ten programs diagrammed above, had some linkages between them.[1] They could be grouped into four major "ways of working" for Sida, each representing a way or approach to addressing the use of research and the ideas of innovation systems:

1. Four countries (Uganda, Tanzania, Mozambique, Bolivia) and one network (PACF) to experiment with the "Triple Helix" methods for the development of innovations in clusters.
2. One country (Nicaragua) to strengthen the universities and their coordinating body to engage in partnerships with key stakeholders to promote innovations.
3. The more traditional research capacity efforts at training and capacity building, but in a new field of science, where the enhanced capacity would then provide the base for an innovations platform (BIO-EARN, Bio-Innovate).

[1] See Chapter 2 and 3 in the Main Report for a fuller discussion on the portfolio, the concepts and their underpinning theories.



4. Two policy research networks – one to understand the role of Universities in innovation processes (UniDev), and the other a global forum and capacity building network for researchers engaged in understanding the role of innovation in development processes and policy (Globelics).

PRI determined that the first four projects above, which aim to promote the economic performance of firms through the use of the knowledge and research capacities of universities via cluster initiatives, formed one group with a common results chain.[2] For these four, the outputs included observed changes in the stakeholder entities that could provide for comparative findings. The Nicaragua intervention could be said to operate on the same premise but with

[2] All four follow the innovations models that are generated from the Triple Helix and Cluster theories, which in turn rest on earlier theories and foundations on innovations and economics.

a modified logic; first, there is an increase in organizational capacity of the knowledge production entity and then there is an increase in outputs of *relevant* research, more *efficiently* transferred to users, and leading to innovation in firms. While the Nicaragua project did not specifically state that the outcomes would be available by the end of the project, we considered that the five country projects had a common objective of improving the application of knowledge to show improved economic outputs through changes in stakeholder capacity and could be compared on this outcome. Thus, a common set of questions was developed to investigate the five country-level initiatives.

On the other hand, the BIO-EARN results chain started with training of individual researchers for PhD degrees within a well-established "sandwich model", which leads to increased individual capacity. When combined with new facilities and a network, this improved capacity leads to increased research on relevant biotechnologies. This in turn develops new knowledge that is disseminated to a variety of stakeholders, including policy makers, which leads to policy change. Finally, all of these developments together lead to new technologies that are applied to solve problems or to innovation in new products or processes that leads to positive growth effects.[3]

Taken together, the biotechnology initiatives and the country-level cluster initiatives meant that the most important countries for fieldwork for the evaluation were Tanzania and Uganda. The next in priority for the portfolio were Bolivia and Nicaragua and also Mozambique. Travel was scheduled accordingly, allowing for greater focus on the outcomes in Africa.

The three supported networks in the portfolio – PACF, UniDev and Globelics – provided for a different set of issues. They were primarily designed as information and knowledge exchanges for a much larger number of people, and so we would expect their outputs and outcomes to be more diffused. They should all result in

[3] This program initiated in 1998 follows the classic linear model of innovations discussed in the theory sections in Chapter 3, Main Report. There it is described that in FORSK innovation concepts were introduced informally in 2003 and subsequently the first formal statement is found in an assessment memo of 2006. Thus a number of ideas from innovation systems were added into the latter phases of a more traditional research capacity building program, leading to an evolution over time. Hence, the results chain (which was implicit) did not include innovation and innovations systems in the early design of the program. It should also be noted that this is a regional program as opposed to the ones above that are bilateral contributions.

improved capacity among the participants through the acquisition of new information, skills and contacts. This in turn should result in new and improved research and knowledge outputs, which should contribute to better policy and action for innovation over time. This is in contrast to the five country projects, which have the larger aim of increasing the *generation of new and often tacit knowledge and the use of prior and generated knowledge*. PACF has the additional objective of increasing the number of cluster initiatives in Africa, but it has only recently begun activities. As such, we determined that it did not allow for an equally in-depth analysis. For the UniDev and Globelics networks, PRI used an electronic survey, complemented by interviews with key stakeholder/participants, and taking advantage of other planned travel as feasible.

The methods used a review of selected policy documents and all available documents on the project portfolio, together with a review of selected evaluations of related themes and research activities, and a detailed review of relevant theories of innovations systems and clusters. The theory and documents provided for the results chain and also the indicators for the evaluation. Interviews with key stakeholder informants were undertaken in Sweden and the five countries. The results chain was often implicit in the documents, and so the theory was used to develop these together with some indicators. PRI interviewed key stakeholders in Sweden and the five countries, focusing on areas not covered in the documents. Seven separate questionnaire surveys were designed to check the hypothesis and outcomes provided by the theory and documents. They were administered to seven initiatives in the portfolio (the five country surveys with common questions plus UniDev and Globelics, using different questions).

The overall methodology was to use an iterative and cross-checking process incorporating these types of information inputs (or a triangulation process between the theoretical frame work, the field work supplemented by electronic surveys), with the idea that there would be greater degrees of confidence in the results when and if different data sets and methods led to the same result.[4,5] The evaluation followed the Logical Framework in devising instruments combined with a systems awareness approach to take into account both the context for Sida and the local context for national and stakeholder

[4] Largely as suggested in the terms of reference and the proposal to Sida and then elaborated in the Inception Report.

[5] See Sida, 2004, Looking Back Moving Forward: Sida Evaluation Manual, p.114.

organisations. The Results Chain (Figure 2, Main Report) was kept as a conceptual tool to capture expectations of feedback and learning as the initiatives unfolded over time.[6] The methods used are consistent with the Sida Evaluation Manual, OECD guidelines and the findings from related studies of similar institutions and efforts (such as DFID, IDRC, and the World Bank).

Four tables were created that summarised the tasks and the questions set by Sida, together with the multiple steps and complementary data collection methods followed for the Inception Report. This provided a vehicle to seek further inputs from Sida and the three supportive groups set up by Sida for the evaluation: the Management Group, the Reference Group and the Consultative Group.[7] The revised inception report presented an initial outline, a set of hypotheses, a structure for the main report and a guide to the evaluation.

The fieldwork, considering both the biotechnology initiatives with the country level cluster initiatives, provided for a greater focus on Tanzania and Uganda in East Africa,[8] followed by Mozambique, Bolivia and Nicaragua in Latin America, receiving lower emphasis.

For the five country projects, the aim was to interview key participants at the core of the project, starting with coordinators, and then moving outwards to most actors directly involved at the University, followed by facilitators, partners and stakeholder organizations, as thoroughly as possible. Further for each country, a questionnaire was designed to follow through on outcomes of the initiatives, along qualitative and where possible quantitative dimensions. Emphasis was placed on iterative and participatory processes. The participatory process included not only the work within the team, but also the cooperation partners, with whom instruments, working hypothesis and interim findings were shared and discussed. Team members undertook field visits[9] during November and December, collecting their information using the agreed upon assessment framework.

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6 The terms are used in consistency with OECD DAC definitions and the Sida use as defined in internal documents, where outcomes are "results necessary to achieve the desired impact, but outside the control of the program".

7 Their roles and responsibilities are described in the ToR, Annex 4, Main Report.

8 Tanzania and Uganda provided for the cluster initiatives with the longest duration and also allowed coverage of BIO-EARN.

9 Full lists of organizations and individuals contacted are provided within each case study. The countries visited included Bolivia, Kenya, Mozambique, Nicaragua, Tanzania and Uganda.

Using the preliminary documents as the base, the evaluators conducted individual, and often group interviews and focus groups. The interviews focused on the partners' and beneficiaries' views on their roles, outcomes and impacts, as well as what worked. The semi-final draft report and the findings from the individual cases were circulated to all key stakeholders in mid-January. This was followed by two presentations in Stockholm on 26 and 27 January. These allowed for substantive discussions on the main findings, conclusions, and recommendations of the report. The feedback from the workshops and electronic submissions from those who were not present has been used to make the final changes.

The findings are reported in two volumes. Volume I is the Main Report, which provides an overview of the evaluation in accordance with the Terms of Reference provided by Sida. In this second volume, each project has been reported upon individually. Here individual narrative reports on each intervention and the findings are presented in detail together with the survey results, where surveys were carried out.

2 Innovation Systems and Clusters Program in East Africa (ISCP-EA)

BACKGROUND

This section provides a common introduction about the three cluster programs in East Africa undertaken in Mozambique, Tanzania and Uganda. It is followed by discussions on the activities, outputs and outcomes in each country, listed chronologically. The discussions on ISCP-EA conclude with an overall section that sums up the findings for the cluster initiatives in all the three countries together.

The idea for the program goes back to September 2003, when ten participants from Uganda, Tanzania and Mozambique were invited by Sida/SAREC[10] to attend the 6th Global Conference on Innovative Clusters, organized by The Competitiveness Institute (TCI) in Gothenburg. The conference brought to the attention of the participants the importance of linking academia, industry and government, through the Triple Helix Model used by VINNOVA, to promote economic development. The East African participants were motivated to organize a smaller regional conference in Africa, in February 2004 and Sida/SAREC provided support for this development. The lead was taken by the Faculties/Colleges of Engineering at the three national Universities in the respective countries – Eduardo Mondlane University, Mozambique; Makerere University, Uganda; and the University of Dar es Salaam, Tanzania (UDSM). This was followed by another regional conference on Innovation Systems and Innovation Clusters in Africa, hosted by the Faculty of Technology, Makerere University, in March 2005.

In September/October 2005, one-week training courses in Innovation Systems and Innovative Clusters (ISIC), led by international experts, were organised in Tanzania and Uganda, with about 40 stakeholders in all representing the university, industry and government. Sida support for the workshops and courses for potential cluster facilitators in this preparatory phase was for SEK 1.69 million for

[10] The unit for research cooperation was called SAREC at the time.

Tanzania and Uganda, with an additional SEK 0.68 million for a training course in Mozambique held in June 2006.[11]

The ISCP-EA programme followed from these preparatory steps. In December 2005, following the initial activities, the UDSM and Makerere submitted an application to Sida for the implementation of a pilot cluster initiative working with VINNOVA as a part of the advisory team.[12] Sida provided a total of SEK 3 million for implementation of the pilot phase, expected to be for a period of 18 months, from January 1, 2006 to June 30, 2007.[13]

PROGRAM FUNDAMENTALS

In each country the ISCP had five major objectives namely: (i) Research and innovation systems policy reviews; (ii) Implementation of pilot innovation systems and/or cluster initiatives; (iii) Awareness creation and publications; (iv) Competence building; and (v) Coordination and follow up forums. Major expected impacts of the programme include poverty reduction, enhanced value addition to local agricultural products and natural resources, preservation of the environment, enhanced gender equity and capacity building. Conceptually, Sida said, "enhanced cooperation between Triple Helix representatives (academia, industry and government), competitive mindset and clustering approach will lead to increased productivity, better quality of products and services; small and medium size enterprises will grow thereby generating more jobs and employment. This in turn will trigger national socio-economic growth."[14] The whole program period included three phases (pilot, scaling up and imple-

[11] Lindroos, M. 2006, Sida MEMO, SAREC/NAV, Support to the Pilot Phase of the Innovation Systems and Clusters Programme in Eastern Africa (ISCP-EA), April 24

[12] In Mozambique planning began in 2005. Some preparatory activities were funded in 2006 from the approved regional grant for Tanzania and Uganda. The formal request for funds was made in 2006 and the allocations for Mozambique were approved by Sida in 2007. See the subsequent section on Mozambique for details.

[13] Each cluster was budgeted for SEK 80,000 (USD10,000) to cover priority activities determined by the cluster during the 18 month period; SEK 600,000 was allocated to cover the costs of VINNOVA Advisory Team; and the balance of around SEK 1.2 million was allocated for programme management, networking and coordination, almost equally distributed at the regional, national and cluster levels providing for workshops, travel and communications, in Lindroos, 2006.

[14] Lindroos, M. 2006

mentation consolidation[15]) that were estimated to require a total of 10 to 12 years, starting with the pilot phase in 2006.[16]

A number of similar and common activities during the three phases included:[17]

1. Identification of capable individuals interested in innovation systems
2. Training teams on clusters and innovation systems through workshops/seminars and also short courses Identify innovation systems and clusters in each country
3. Determine the characteristic features of the identified innovation systems and clusters
4. Determination of mechanisms that will make innovation systems in the various sectors stronger
5. Identify, map-out and assess the role of business and supporting institutions in the innovation process within the clusters
6. Establish resource structure to sustain the network
7. Organise cases for in-depth study
8. Establish benchmarks for gauging the successes and failures of innovation systems and clusters
9. Identify the successes and failures of the selected innovation systems and clusters
10. Study factors contributing to the success or failure of the clusters and innovation systems
11. Assess and analyse how existing policies affect innovation within the clusters

[15] They were described in Lindroos, 2006, p.3, as 1) Initiation of the Programme and the Pilot Programme, 2) Full Scale Operationalisation and Implementation, and 3) Programme Consolidation. The consolidation phase is intended to be used to transform the programme into permanent features in respective countries. The ultimate goal of the ISCP-EA programme is to have a well functioning national system of collaboration between researchers, innovative firms and farms, and financial and political institutions for promotion, development and marketing new products, services and entrepreneurship.

[16] Estimate by Sida in the assessment memo of Lindroos, 2006.

[17] Proceedings of Regional Conference on Innovation Systems & Innovative Clusters in Africa, Bagamoyo-Tanzania, Feb. 18–20, 2004 and periodic submissions by VINNOVA. As will be seen later, the in-depth studies and benchmarks for gauging the successes and failures (numbers 7 and 8 on the list), were not attended to.

Table 1: ISCP main characteristics

Countries	Dates	Sida Funds	Key Activities Planned	Planned Outputs
Preparatory work				
Tanzania Uganda Mozambique	2003–2005	2.4 million SEK	Workshops and training of cluster facilitators. Cluster identification.	Awareness. Capacity on cluster development. Proposal for main phase.
Phase I: Pilot				
Tanzania Uganda	2006–2007	3 million SEK	Support 15 clusters (8 in Tanzania and 7 in Uganda). Management, networking, coordination. Mapping of clusters and innovation systems. In-depth study of the selected clusters and innovation systems carried out including an assessment of extent to which they are innovative, of bottlenecks for growth, and determination of mechanisms that will make innovation systems in the various sectors stronger and sustainable; Consolidation of potentially innovative clusters. National and regional workshops and advocacy initiatives. Short and long-term training in innovations, innovation systems and clusters established (MSc and PhD programmes at UDSM).[18] Exchange of staff involved in innovation programmes; National Steering Committees, National Coordinating Offices and a cluster development monitoring system permanently established.	A network of capable individuals interested in innovation systems and clusters formed. Increased knowledge of selected clusters. Increased knowledge of selected clusters and selected interventions, results of interventions. Sustainability. Increase awareness: Influence policy. Increase learning. Sustainable and effective management.
Mozambique	2007–2009	1.5 million SEK	8 CI and similar other activities.	Similar to the list above.

[18] No systematic efforts towards these M. Sc. and Ph. D. programs were undertaken. This was not followed up further on outputs or outcomes.

Countries	Dates	Sida Funds	Key Activities Planned	Planned Outputs
Phase II: Implementation and full scale				
Tanzania	2008–2009	3 million SEK	Continue with 4 out of 8 original clusters.[19] Begin support to 11 new clusters. Management, networking, coordination.	No new outputs were listed and assumption is that they remained as before.
Uganda	2008–2009	3 million SEK	Continue with 4 out of 7 original clusters. Begin support to 15 new CI. Management, networking, coordination.	Similar to Tanzania.

An overview of the ISCP-EA and the individual bilateral programs for the period under investigation is given in the table below. All programs have continued beyond 2009, but subsequent activities and outputs are outside the scope of the present study. Each of the national programs are described further in the following sections.

The outcomes and impacts arising from the implementation of the programme were expected to contribute to poverty alleviation through an increase of productivity, improvement of quality of products and services, and growth of small and medium size enterprises. It was expected that the value addition would be applied primarily to agricultural products and other natural resources. The enhanced innovativeness and competitiveness was also expected to lead to more environment-friendly products and services. Capacity building in innovation, marketing, and related issues were expected to improve gender relations especially in rural areas, and as a result of development efforts within the agro-industry sector.

CONCLUSIONS

Conclusions for each national program are reported in the subsequent sections. Even so, we provide some overall conclusions drawn for the East African Cluster Initiatives (CIs) already here.

[19] As this was planned, this statement suggests a level of monitoring and follow-up existed within the program. The documents available for the evaluation do not elucidate how this was assessed and the decisions taken. The same is true for Uganda.

A striking and surprising common feature of all the initiatives were that they were not preceded by any baseline surveys of the clusters and their members, even though this was emphasized in various meetings and in training workshops during the program implementation. Nor did we find periodical and systematic follow up of each cluster that would allow a complete and clear picture of the evolution of outcomes and impacts in a quantitative manner. It has been reported that the cluster initiatives were visited and evaluated by both the National Steering Committee and the international team,[20] but these appear to have been impressionistic as no records of these evaluations were seen. There was one useful survey[21] of the training provided to cluster facilitators undertaken by one of the external cluster trainers in 2008.

The only other efforts made at a systematic follow up of the outcomes of each cluster and that of the groups in each country were due to Sida initiatives through a policy research network, African Technology Policy Studies (ATPS), in 2006 and 2008.[22]

In the absence of such data, it is not possible in this evaluation to provide quantitative information on *impacts*. But the report below notes qualitative impacts as observed from different reports and also from the field work undertaken. In terms of *output*, on the other hand, some of the results of the program are quite impressive. There were over 200 cluster facilitators who were trained and through their initiatives 49 CI were begun. In our view in the absence of stronger monitoring and review[23] there was a natural tendency by stakehold-

[20] For example the report by the National Steering Committee, ISCP – Uganda, Report On the 22 Cluster Initiatives: Kampala Innovative Systems and Cluster Program 2007 to 2010 – Implemented by Faculty of Technology, Makerere University, November 2010, states that "Monitoring and evaluation exercises and visits by the National Steering Committee and the International Team were conducted and a report written. All the clusters registered significant success."

[21] Ffowcs-Williams, I. 2008a. ISCP East Africa Facilitators Survey, Cluster Navigators Limited, New Zealand, 11 November 2008. Even here, only 25 % of the numbers trained appeared to have filled the survey.

[22] The two studies have been used as inputs to the evaluation and are listed in the references.

[23] Ffowcs-Williams, I. 2008b. Innovation Systems & Clusters Programme, East Africa: What have we learnt so far? Cluster Navigators Limited, New Zealand, 18 December 2008, commented that by the end of 2008 one quarter of CIs had not held a public workshop or established a Cluster Leadership Group; a similar but smaller number had yet to engage in useful economic initiatives within the CI, suggested that Monitoring & Evaluation components needed to be separated "With monitoring being much more

ers and managers to focus on activities and easily measurable intermediate outputs – numbers trained, numbers of workshops and numbers of CIs begun. But the outcomes of these initiatives were not clearly known and were accorded a low priority in the monitoring and periodic reporting of results.

In almost all CIs visited (see further information in the following sections), it was noted that the small and micro enterprises lacked formal management and accounting skills. Many micro-entrepreneurs were not literate and most who had some education did not complete high school (note that this certainly was not the case for clusters in more sophisticated and modern sectors such as management, ICT, consultancy, education services and others) and so it was often not difficult to add to the capacity of these micro-entrepreneurs through training. Such training and skills development is well within the scope of the University and other training organizations to provide, and it clearly made a difference.

The design of the projects (as well as the expansion plans) appear to have under-estimated the difficulties of facilitating CI development, and the time and resource commitments required by the facilitators. Some found that this was almost full-time job. Yet all facilitators undertook this activity on a part-time basis while undertaking their own regular full time work, business or jobs and their contributions to the CIs were made on a voluntary basis. The lack of financial compensation for the cluster facilitators in the project design raises several issues. On one hand, it simplified project management as facilitators could be selected on the basis of their personal enthusiasm and the challenges posed in the selection and management of paid consultants was avoided. It also avoided and reduced the potential mistrust of the beneficiary population.[24] Certainly some of the CIs did not make progress as a result of too little time devoted to cluster activities by some of the facilitators.

The achievements are notable considering several challenges. First, beyond the constraint of time availability of facilitators already discussed, relatively limited and uniform funds provided per

learning by doing and quickly adjusting in real time, rather than a formal review at a future date. Monitoring may identify, for example, that the 'XYZ' cluster is off track." While evaluation being more a qualitative assessment at 2 to 3 year intervals, through independent reviews across cluster and triple helix stakeholders views on the status and outcomes.

[24] Ironically many cluster firms did not believe for some periods that the facilitators were in fact not being paid and suspected that they were in fact being paid, only that the information was being kept secret.

initiative. Many cluster activities required larger absolute levels of funding to achieve more significant impacts. Even small amount of funds were often delayed in their release for use in part by slow remittance from Sweden, in part by delays within a cumbersome university payments system. This created difficulties and significantly impaired progress.[25] Most CIs suffered from a lack of physical infrastructure – offices, equipment, land, show/sales rooms – though some of the more successful ones found creative ways to solve the problems, often making use of resources that were otherwise idle. Trust among cluster members was always initially low (this was reported uniformly by cluster members who represented producers in most interviews) and they also stated that they were not initially convinced that the initiative would deliver concrete benefits where others had failed earlier. Where the initiatives provided some results, even when somewhat limited in value, the trust between the members increased rapidly and members in all relatively successful initiatives reported on the importance of the growing trust to enable higher levels of positive outcomes.

In terms of national awareness of the cluster program/concept to wider groups and to higher levels of policy makers our observation was that it was most successful in Uganda and least successful in Mozambique, with Tanzania in between.

University-based, R&D intensive cluster initiatives such as sisal and energy have been unsuccessful. This is in keeping with the theory and general observations in many research studies (see further discussions in Chapter three, Main Report) that there is a general disinterest of local industry to engage with academically oriented research. The private sector relies on simpler technologies and finds alternative means to source these, when required, via imported know-how and equipment and the local university is not usually seen as a credible source. Low motivation for research in existing Triple Helix institutions has been noted in many assessments and is one factor that hindered additional successes and in terms of influencing the research environment at the universities positively, one of the aims, the improvements are more noteworthy in Uganda than in Tanzania. In Uganda, the project involved over 20 students from the Entrepreneurship and Small Business Management programme of Makerere University Business School to various cluster initiatives to

[25] Ffowcs-Williams, I. 2008b.

facilitate two way knowledge transfers between the University and the clusters. This was an useful beginning with the students developing proposals for future implementation in the clusters. But it must be noted that linking knowledge institutions to firms is not easy. Many studies find that firms tend to draw on knowledge inputs first from other firms for their innovative activities and only later, as they deepen their own innovative capabilities to include design and technology development, do they begin to interact in significant ways with research organisations. Thus the cluster model cannot be seen as a simple solution to link public Research and Development organisations to innovation in industry and it must be noted to be more difficult in poorer countries, as the poorer the conditions, the weaker the links within a "system of innovation". This does not mean that going from research to application is not possible, but it requires greater efforts as was made in Uganda.

Worthy of mention here is that most of the clusters are pro-poor initiatives, and many focused especially on disadvantaged segments such as women. For instance, in Tanzania, mushroom, seaweed and contract farmers of vegetable seeds, most active members are women. Women also dominate the Nutriceticals and Vegetable and Fruit clusters. Even the metal cluster, which is dominated by men, produces technologies that to a large extent cater to rural women by the way of reducing their drudgery. For the Cultural Heritage and Tourism cluster, most food vendors and processors are women. The impacts on women in CIs, where large numbers of workers and cluster members are women, includes a significant feeling of empowerment through additional income, as well as the acquisition of new skills and responsibilities. Similarly in Uganda, several clusters such as basket weaving, mushroom cultivation, and textiles, also had predominance of women members who benefited through additional income, and the acquisition of new skills and responsibilities.

3 ISCP – Tanzania

BACKGROUND[26]

The College of Engineering and Technology (CoET) at the University of Dar es Salaam, Tanzania, was the lead institution that took the initiative and managed the programme in Tanzania. CoET trains engineers in several disciplines, undertakes research and provides expert services in consultancy contracts to public and private organizations. It aims to be fully involved in prototype development and technology transfer and has an office of Technology Development and Transfer Centre (TDTC).

In 2003–2005, Sida provided seed money to create an awareness of how innovative systems for development of commercial products and marketing can be built up locally and how these systems can initiate and frame a regional renewal process. It began in 2003 by supporting delegations from partners in Mozambique, Tanzania and Uganda to attend an international conference on innovative clusters – the 6th Annual Conference of "The Competitiveness Institute" (TCI) on Innovative Clusters held in Gothenburg. The delegations included researchers, government officials and entrepreneurs, the core constituents of the Triple Helix model[27]. Swedish experts also participated as resource persons in this work. As a result of the interest in innovation systems and innovative clusters created, the group of participants augmented by additional local stakeholders and representatives from academy, industry and government in Tanzania and Uganda developed a proposal for further support, based on action plans derived from observations and lessons learned during continued local workshops and meetings. In 2006, eight pilot CIs

[26] This report was prepared by Amitav Rath with the assistance of Bitrina Diyamett. It is based on documents reviewed that have been listed, a field visit and interviews in December 2010 focused on the first 8 CIs, and smaller reviews of the later CIs. The report includes the responses from eleven stakeholders to the electronic survey designed for the evaluation. The survey design was jointly undertaken by the team. The analysis of the results was carried out by Mario Bazán, with Fernando Romero and Raul Cárdenas, all at FNI, Lima.

[27] For more details on the theory of Triple Helix and Cluster Initiatives on which the initiative was based see Chapter three in the Main Report.

each composed of members from the Triple Helix were established in Tanzania and each CI prepared action plans for implementing the initiatives (within a budget of USD 10,000), which were discussed and approved in a workshop.

FINDINGS

Table 3.1: Summary of first eight clusters in Tanzania (initiated in 2006)

Data Used	Features, activities and outcomes
Cluster 1 Metal works and Engineering – Morogoro (MECI)	
- 2006 – Cluster Initiatives Evaluation - 2008- Cluster Initiatives Evaluation - SICD and Facilitator Notes and feedback - Electronic survey undertaken for the evaluation (see Annex) (No Field Visit.)	The MECI cluster located in Morogoro municipality began with 14 firms working in the metalwork and engineering sector, and 27 micro enterprises, located close to each other, working on charcoal stoves. The metal working group had relatively higher education levels compared to other clusters. The charcoal stove makers, who had started with a single enterprise in 2003, were growing rapidly in an organic cluster. In 2006, members praised the efforts made in training and said that they learned new things, and the stove makers implemented a new technology as a result of the learning, by the time of our visit, and did so successfully. However, the level of social capital and trust was seen to be underdeveloped, with potential benefits of clustering and working together not very valued among the cluster members. There was greater anticipation of improved access to capital, though the stove makers seemed to value the idea of working together to minimize costs – especially in regard to the transportation of raw materials such as clay. There was some limited informal collaboration, especially between those firms that are neighbours. The cluster included firms that are micro, with few resources, and others that are larger, with good access to resources. There was very little interaction between the two segments and little trust. The facilitator is a highly motivated entrepreneur, but had to work hard to build enthusiasm among members.[28] The MECI was reviewed again at the end of 2007, when the earlier mistrust and lack of cooperation by members had been turned around through the efforts made by the CI facilitator, who belongs to a member firm. This and other examples show that the quality of facilitation and leadership are among key success factors. Also important is the wider visibility of a CI. It has been reported[29] that the membership had increased to 44 registered firms with more than 450 employees. The firms working on engineering and production of post harvest machinery and wood working have expanded markets in Tanzania, Southeast Africa and are even linked to emerging markets in Europe.

[28] Diyamett B.D. and Komba, A.A. 2006. Cluster Initiatives Evaluation.

[29] See SICD, Sjögren, D. and Trojer, L. 2010. Experiences, results and impact, 30 September.

Data Used	Features, activities and outcomes
	The training of employees and coaching of young entrepreneurs are ongoing activities. A revolving fund for firm level innovations has been established, funded by MECI's own resources. The fund is used for soft loans for entrepreneurs to buy material and components to be used for prototyping. A team of experienced engineers in the CI supports the prototyping activities. When the new products reach the market, the loans are paid back. Cluster firms collaborated in developing a seed drill equipment prototype. They first contacted leading experts worldwide, and then one of the identified experts participated in the development work, producing the new equipment. The final project report states that outputs have gone up from 30% to over 200%. Two firms producing stoves increased their turnover from 12,000 USD 2005 to 160,000 USD 2009. There is increased specialization, with one firm making ceramic inserts only, one making the outer shell and a third undertaking assembly. In the report made at the third PACF meeting in February 2011 the Cluster Facilitator stated that at the end of 2010 the CI had as members 60 registered companies, 9 engineering workshops, 20 groups of tinsmith and 38 woodworking enterprises. This report is based on project documents and was not visited during the evaluation.
Cluster 2 Zanzibar seaweed	
- 2006 – Cluster Initiatives Evaluation - 2008 – Cluster Initiatives Evaluation - SICD and Facilitator Notes and feedback - Electronic survey undertaken for the evaluation and facilitator responses - Field Visit consisting of two days of meetings, with cluster facilitators, government employees, community leaders, a research institute and discussions with over 100 cluster members, 90% women. - Field survey of cluster members	Seaweed farming was introduced in Zanzibar during the 1980s by researchers at the Institute of Marine Sciences (IMS), who had noted its use in some Asian countries and its potential as a cash crop. Since then the number of active individuals increased from a handful in the early days to about 100 in 2006. The majority of persons involved in its harvesting, collection and sales are women (estimated at over 90%) also engaged in common activities of seaweed farming and soap making. Two species of seaweed are farmed and these are Eucheuma denticulatum (Spinosum) and Kappaphycus alvarezii (Cottonii) Farm gate price of Cottonii = 400–500 TZS. (US$ 0.3). Farm gate price of Spinosum= 200–250 TZS. (US$ 0.1). At the moment, there are related but distinct cluster activities centered in two villages: Bulelwo and Kidoti, both in Unguja. The Seaweed Cluster Initiative members are engaged in common activities of seaweed farming and making value-added products including soap, body creams, and food. At the moment, the cluster activities are centered in six villages in Zanzibar: Bweleo, Kidoti, Paje, Nyamanzi, Chwaka, and Kisakasaka. Just like mushroom cluster (see below), most important environmental factors for this cluster is a huge natural resource endowment, huge potential for export marketing and the close involvement of the higher learning institution, the Institute of Marine Sciences (IMS).

Data Used	Features, activities and outcomes
	In the beginning it received some impetus from the government, though the cluster organically evolved over time, with people joining the business spontaneously. The word about the cluster initiative spread, and like the mushroom cluster, there is an enormous enthusiasm noted by the people in working together in this cluster initiative. This is evident from the relatively strong linkages already developed between cluster members. This initiative has built further on the existing linkages between farmers, researchers at the IMS, government officials and some of the traders. There is also evidence of sharing knowledge on new techniques and market conditions, which are essential for sustainability of the cluster. This initiative is interesting in many dimensions and is discussed at greater length separately. SICD reported in 2010 – membership has grown from one village and 20 cluster members in 2006 to 10 villages with 3,000 members 2010. 17 new firms work with value added seaweed products. The cluster objectives from 2005 are presently fulfilled. The farming methods of high price seaweed has improved productivity and profits, development of new sea weed products has increased the income of the woman farmers, contributing to family incomes and wealth. Seaweed is used as raw material for a whole range of products – soap, cosmetics, snacks and soups – in 29 different products. Participation of women in innovation activities, production and sales is immense. New designs of equipment for deep-water farming have been developed farmers' teams, working together with the facilitator. The facilitator as researcher has introduced new farming methods to cope with environmental and climate changes. The women participate fully in all activities of the CI. ZaSCI has deliberate work with communication and media. Foreign media has reported about ZaSCI. A documentary film in Germany resulted in a private donation to ZaSCI to buy five boats for deep-water farming. There is a storefront established on the highway to sell CI products to travellers and tourists (and parallel work on oyster farming, decorative work on oyster shells). A development and production centre is functioning as a site for innovation, training, development and production of seaweed products. There is increased recognition of the need to protect the environment and this has become a priority among cluster members.

Data Used	Features, activities and outcomes
Cluster 3 Tourism – Bagamoyo	
- 2006 – Cluster Initiatives Evaluation - 2008- Cluster Initiatives Evaluation - SICD and Facilitator Notes and feedback - Electronic survey undertaken for the evaluation and facilitator responses. - Field Visit consisting of sets of meetings with cluster members, community leaders, and discussions with and survey of over 15 cluster members, 70% women.	Bagamoyo is north of Dar es Salaam and is a UNESCO world heritage site. The history dates to the 13th century with the arrival of Arabs and later on it was an important trading post for the slave trade. It has a number of ancient buildings and antiquities, located on the sea coast, and a National Park nearby. Organizationally, the Bagamoyo Cultural Heritage Tourism Cluster Initiative (BCHCI) has a number of sub-clusters (10), focused on the specific needs of Hotels; smaller guest houses and lodges; Transport operators; Tour guides; Restaurant and bars; Food vendors and processors; Handcrafts producers and sellers; Theatre and sculpture; and, Traditional healers and Herbalists. The cluster activities have been focused on value added services and building local skills and capacity through training. For example, the UDSM provided training for tour guides in history and local culture to improve their skills. SICD reports that "83 cluster members have been trained in relevant skills. The number of employees has increased in cluster firms, i.e. hostels and lodges (+160), in restaurants and bars (+120), fishermen (+320) etc." Income is reported to have increased by 5%. The field visit and interviews with cluster members suggested high levels of motivation, organization and high satisfaction with the initiative. We were informed about regular meetings to discuss issues; and the discussions suggested high social capital, trust and cooperation among members. The members clearly recognized the network benefits and the important linkages between sub-clusters and members. The local Bagamoyo College of Arts is a member of the cluster and its contributions to new arts – sculpture, painting and theatre – was observed to play an important role in the local revival of arts. The government has contributed one building as a show place and market for local arts and crafts. The members wish for another dedicated only to women. Linkages have been established with other tour groups elsewhere and also with the second CI at Tanga started in Phase 2.
Cluster 4 Mushrooms- Dar es Salaam, Coast and Morogoro regions (Eastern region)	
- 2006 – Cluster Initiatives Evaluation - 2008- Cluster Initiatives Evaluation - SICD and Facilitator Notes and feedback - Electronic survey undertaken for the evaluation and facilitator responses.	This cluster covers a wide area – the regions of Morogoro, Dar es Salaam and Pwani. It consists of mushroom farmers, spawn makers, wild mushroom pickers and processors. The 2006 review (B. D. Diyamett & A. A. Komba, 2006) found this cluster to have good potential – good natural resource endowment, potential market – internal and export, existence of a stakeholders association, that was meeting and discussing barriers before the cluster initiative began, and close involvement with UDSM. It said that the message on the cluster initiative spread rapidly, there was enthusiasm for working together, as there were known knowledge and value chain gaps – production of good quality spawns, quality and cost of substrates, temperature and humidity conditions and market requirements for higher quantities that small producers could not meet.

Data Used	Features, activities and outcomes
- Field Visit consisting of sets of meetings with cluster members, community leaders, discussions with over 15 cluster members, 70% women, and review of spawn making and mushroom farming.	A follow up review after the 18 months of the first phase found positive impacts – mushroom production is better established, hence producers have better access to financial and material resources. A mushroom collection centre was secured from the local government, and funds for training were availed of and a mushroom growers' manual was produced. Mushroom farmers got to know each other and there was improved flow of market information and knowledge on better methodologies on farming and collection of wild mushrooms. Local banana leaves were introduced in mushroom farming, reducing costs and increasing the use of local by-products. There was product diversification to include mushroom cakes and snacks. An increase in numbers of mushroom farmers was noted and increased membership in the CI. It has trained over 80 farmers, who then train others. It won matching funds from a national programme. This CI could succeed even though it suffered from one major challenge, the very wide area covered, which made communication and meetings of members difficult and expensive. The Cluster members wish to have a sustainable source of funding. The problem of distance may be resolved by dividing the cluster into 3 sub-clusters, with leadership put in place for each. It was reported that there are over 70 cluster members. But given the spread of the region, there are effectively sub clusters. The overall reach is larger than the 70 through the mushroom association.
Cluster 5 Nutraceuticals/phytochemical, functional foods – Dar es Salam	
- 2006 – Cluster Initiatives Evaluation - 2008- Cluster Initiatives Evaluation - SICD and Facilitator Notes and feedback - Electronic survey undertaken for the evaluation and facilitator responses. - Field Visit consisting of sets of meetings with cluster members, community leaders, and discussions with 4 cluster members, 50% women, review of market outlets, new products, farming and production facility.	This CI focused on the production and processing of food products to add value as food supplements and/or include some medicinal properties. These include soybeans, moringa, aloe vera and mushrooms. The cluster aimed to increase public awareness of these foods, facilitate production, and improve quality and safety. It was not possible to hold discussion with many members, but the field visits included interviews with the facilitator and visits to three producer members. The members that we met with are individuals and/or small firms producing a range of products, mostly for Dar es Salaam market. A number of supplemental food products, especially for children were seen to be produced. All interviewed stated that the cluster was beneficial, allowed them to learn and solve common problems. There are some efforts towards having some common manufacturing facilities with machines that are too expensive for individuals.

Data Used	Features, activities and outcomes
Cluster 6 Sisal (utilization of waste) – Tanga	
- 2006 – Cluster Initiatives Evaluation - 2008- Cluster Initiatives Evaluation - Project documents - Electronic survey undertaken for the evaluation (No Field Visit.)	This cluster is made up of small-scale sisal farmers and two large private companies – Gomba and Limited, that is the monopoly buyer of sisal. The farmers are linked to Mlingano Agricultural R&D Institute, and Katani had some limited linkages with CoET- UDSM. The aim is to develop value addition to sisal, mainly processed for the fibre, but potential products include, sugar, alcohol, bio-fuels and sugar. A 2006 review found a lack of social capital and trust, both among farmers and between farmers and the firm; poor linkage between the R&D institute and farmers; and hypothesized that this CI was largely driven by academic and research interest on alternative, innovative products from sisal. The 2010 report stated that this cluster was inactive in recent years.
Cluster 7 Small scale fruits and vegetable processors -Morogoro	
- 2006 – Cluster Initiatives Evaluation - 2008- Cluster Initiatives Evaluation - Project documents - Electronic survey undertaken for the evaluation (No Field Visit.)	The Morogoro region has good weather, conducive to producing vegetables and fruits. This CI dealt with the processing, including drying and packaging, of vegetables and fruits, for preservation and conversion to new, value-added products, such as beer, wine and juices; canned and dried vegetables and fruits. At the start it was felt that there was a good spirit of collaboration, demonstrated in efforts at having common market outlets and processing facilities. The CI included the Sokoine University of Agriculture, CoET-UDSM; Small Industries Development Organization (SIDO), Tanzania Chamber of Commerce, Industry and Agriculture (TCCIA) and government authorities, including the Tanzania Drug and Food Authority (TDFA). A review after 18 months showed that the cluster was better known to customers and government officials, and there were greater sales, as well as assistance from the local government, which provided a premise for a joint market outlet. Members said that it created a forum for exchanging ideas, leading to improvements in product quality for most members. They had organized a joint exhibition of the CI member outputs. The members initiated joint purchase of raw materials, which according to them greatly reduced cost of inputs. Challenges noted were on quality control and trademark. SIDO made labels for all the small food processors, but poor quality of some harmed all who used them, so some plan to make their own. The members were working on this. Others are a lack of capital, and that there were too many producers for the same small market. There was also dissatisfaction on the training courses offered with requests for deeper and wider coverage. The 2010 report stated that this cluster was inactive in recent years.

Data Used	Features, activities and outcomes
Cluster 8 Vegetable Seed Cluster – Arusha and Kilimanjaro	
- 2006 – Cluster Initiatives Evaluation - 2008- Cluster Initiatives Evaluation - Project documents - Electronic survey undertaken for the evaluation (No Field Visit.)	This CI incorporated the Arusha and Kilimanjaro regions, covering the districts of Arumeru (Arusha), Hai and Moshi rural (Kilimanjaro). The specific agro ecological properties of the zone make it suitable for agricultural production. The region is the home for more than 90% of Tanzania's seed companies (both local and foreign) and also includes vegetable seeds research institutes, including the African Regional Centre of the World Centre for Vegetable seeds. It was noted that more than 80% of the vegetable seeds used in the country are imported. This CI was to explore options for increased value added and was seen to have a high potential. This same activity has been picked for possible development in the new World Bank and donor supported CI managed by Tanzania Private Sector foundation (TPSF) begun in 2010. The 2010 UDSM report stated that this original CI was inactive in recent years but it is reported to have started linking producers and processors of seed with makers of seed separation machines, R&D institutions and government sectors and produced more than 5 varieties of good quality seeds.

In the following phase (2007–2009), 11 new clusters were launched and four out of the above eight pilot clusters – Bagamoyo Tourism and Cultural Heritage Cluster; Eastern Region Mushroom Cluster; Morogoro Metalwork and Engineering Cluster and the Zanzibar Seaweed Cluster – were selected to participate in the second phase. Hence in the period 2007–2009 there was a total of 15 actively supported cluster initiatives, from the 19 that had been initiated. This period (2009) also had an analysis the training needs of cluster members and leaders in business management, examining gaps and to determine specific training needs in business management, with approaches relevant to cluster firms. This resulted in the production of a "Training Manual" with over 90 pages for five days of training that covers most of the basic issues in management, but an examination suggested that it was too generic for direct utilization and would need to be modified for different cluster groups.

Table 3.2: Summary of second eleven clusters in Tanzania 2007/8 – 2009/10

Data Used	Features, activities and outcomes
Cluster 1 Morogoro Rice Processors	
- Project documents - Electronic survey undertaken for the evaluation (No Field Visit.)	This CI focuses on rice farming and processing with 50 farmers and 12 processors as members. CI established in 2008 and geographically covers Mvomero District and Morogoro Municipal. It was reported subsequent to the field visit that the CI has a network with Dakawa Research center and Mvomero Trade Office. Successes were reported to be acquisition of a government rice farm with collaborating infrastructure support (300 million TZS in 2009). The rice productivity has increased with improved seed variety. All farmers use tractors for land preparation and fertilizers, some farmers now use chemicals for weed control and most of irrigated rice farmers use combine harvesters. The farmers have difficulties in accessing loans individually and so have formed group associations to acquire funds and inputs. As yet, there is no market links in place; informal linkages amongst farmers, traders and processors. Total paddy and rice income is reported to have increased from 52.2 million TZS in 2007 to 91.8 million TZS in 2008.
Cluster 2 Cassava	
- Project documents - Interview and Electronic survey undertaken for the evaluation (No Field Visit.)	This was established only in 2008. Cassava Farming, Starch extraction, cassava flour milling are included in the CI and there are now 33 farmers, 6 processors, 12 field workers who are members and it was stated that the cluster training changed their minds about the possibilities for increasing productivity as they learnt new ideas for increasing the value added in the value chain. Apart from the cassava flour, members also produce cassava chips for human and animal food, such as bread, bans, cakes, biscuits, and spaghetti. Some members were provided with processing machines through the Incubator Project of UDSM but have not managed to acquire premises to install them. They are collaborating with government and university on value added processing, machine development (e.g. Sokoine University and UDSM), but have run into financial constraints.
Cluster 3 Oil Seeds – Dodoma	
- Project documents - Electronic survey undertaken for the evaluation (No Field Visit.)	This CI's activities are based in Dodoma municipality (where the processors are located) and Mpwapwa District (where the farmers are located). The CI is currently working with sunflower seed but plans to include other seeds in the future. Currently the CI has farmers in all 16 Wards in Mpwapwa. Production is low because, among other things, farmers use low quality seeds that they produce themselves. The CI's aim is also to help the farmers produce better quality seeds through farming practices such as the use of organic fertilisers (mainly cow dung). The number of cooking oil processors is 21 up from 13, more than 20 traders and 5 transport operators. The CI is strongly supported by the TCCIA offices at the Regional and District levels and also from the district authority.

Data Used	Features, activities and outcomes
Cluster 4 Textile and Garments	
- Project documents - Electronic survey undertaken for the evaluation - Field Visit and interviews with 5 firms.	This cluster started with a few firms and has grown to over 120 member firms, scattered in Dar es Salaam, with a total of 655 employees. Many firms are small. The major lines of business of this cluster are: tailoring (most important), weaving, and batik making and designing. The cluster has one large garment company with over 40 full time employees and it exports its products to Europe and US. The interviewees mentioned that the benefits received from the ISCP-TZ Project included: - Mobilization, networking and learning from each other, i.e. sharing of experience in all of the above business lines. This was through workshops and meetings organized by the cluster using funding received from Sida. - Training on general business practices such as bookkeeping, project write-up, etc, facilitated by Gatsby Trust, managed by COeT. - Kaizen training on efficiency, which imparted knowledge on personal change, innovativeness and organizational change, teamwork and transparency. According to the respondents, the training was so useful that their incomes rose as a result. This was not directly funded from the ISCP-TZ, but was facilitated by the project. Among continuing challenges mentioned was the large size of the cluster, making management by one facilitator difficult. According to the current facilitator, the cluster needs to be broken into several sub-clusters with additional assistant facilitators. - Raw material procurement is a problem as the firms need many different kinds of materials to make different kinds of products. With the demise of the textile industry in Tanzania, there is a weak supply chain for some materials. Improving supply chain for materials, accessories and dyes were considered important. There is a lack of final testing and certification for dyes and this has to be done abroad. - The cluster leadership felt that more than textile engineering inputs, textile and handcraft design was more relevant to their work. They looked forward to university training in this and for qualified student internships at the cluster firms.
Cluster 5 Building Construction	
- Project documents - Electronic survey undertaken for the evaluation - Facilitator Reports and interview. (No Field Visit.)	This CI was started based on the fact that there was a growing market evidenced by the construction boom, but local skills were low. Foreign firms represent 3–4 % of the suppliers and supply 70 % of the market. Members for this CI includes contractors- Building works and services, consulting engineers, architects and quantity surveyors informal construction workers. They have created a partnership/consortia to collaborate on larger projects.

Data Used	Features, activities and outcomes
Cluster 6 Cultural Heritage Tourism – Tanga	
- Project documents - Electronic survey undertaken for the evaluation - Facilitator Reports (No Field Visit.)	Similar to Tourism – Bagamoyo CI in previous table. Apart from members such as artists, designers, tour operators, hotels, and media people, the CI has associations as members such as Tanga Youths Development Association-TAYODEA and Tanga Women Artists Network (TWAN). In addition to the members and activities, the CI just like the Oil seed in Dodoma strongly supported by TCCIA at Regional and District levels. Some members have been trained in different aspects e.g. designing, tour operation, and hotel management, both in Tanzania and abroad (USA – through TCCIA). It has been reported in documents and by the facilitator that the CI was progressing well.
Cluster 7 Wood Carving- Dar es Salaam	
- Project documents - Electronic survey undertaken for the evaluation - Facilitator Reports (No Field Visit.)	No information was available.
Cluster 8 Small Scale Gemstone Mining – Kilindi	
- Project documents - Electronic survey undertaken for the evaluation - Facilitator Reports and interview (No Field Visit.)	This CI focuses on mining and selling precious and semi-precious gemstones such as red sapphire, green garnet, pink rhodolyte, purple amethyst, blue sapphire, golden zircon, red tourmaline, blue topaz, pink ruby and rose malaya garnet. This cluster started with 20 small scale miners in 2007. The CI reports that it now has 311 members, mostly women engaged in small scale mining, and covers 20 villages in seven districts of Kilindi, Mkinga, Handeni, Lushoto, Muheza and Tanga, in the Tanga Region, and Simanjiro in the Manyara region. Meetings within a village group take place frequently and with more distant members once in three months. Achievements reported include training, trust and capacity building among members, formalization of enterprises, paying taxes, membership of national and international associations, analysis of stones and quality advice provided by CoET. Members' sales reported to have increased by 45% in both local and international markets combined. It was stated that they need much more technical help with regards to mining and markets, and lack of financial resources are a challenge.

Data Used	Features, activities and outcomes
Cluster 9 Educational Services	
- Project documents - Electronic survey undertaken for the evaluation - Interview with cluster member. (No Field Visit.)	Focus is the production of provision of services such as laboratories for secondary and high school students who are preparing for exams, tuition services, as well as day care services. Members include owners and runners of school centres; makers of science laboratory equipment, school furniture, teaching aids & other equipment; book sellers; sellers of school items such as stationers; teachers; and government offices responsible for education. This CI now has 24 members, both firms and individuals, but is not physically congruent. In interviews it was stated that the cluster training "was eye opening" and the cluster members are working closely with municipalities on their education and material needs.
Cluster 10 ICT – Dar es Salaam	
- Project documents - Electronic survey undertaken for the evaluation (No Field Visit.)	It focused on Web design, Web publishing. No additional information was available.
Cluster 11 Biofuel	
- Project documents - Electronic survey undertaken for the evaluation - Facilitator Report and meeting (No Field Visit.)	Focus: producing bioethanol, biodiesel, biogas, ethanol gel. This CI was based on the view that there is a large demand for fuels. The CI focused on use of waste and biomass, and operated on the belief that biofuel production can add substantial value in the existing production of sugar (molasses), sisal waste, wood, oil seed, edible oil, solid waste etc. It was argued that this has the potential to build a knowledge-based industry, and the action plan was judged excellent. Unfortunately, the assessments proved wrong and there was no interest from most of the large manufacturing companies, and a few small-scale who were interested had no capital. It followed that there were no CI members at ground to start the CI and it became dormant. This appeared to be theoretically sound only because it was more academician led and promised to provide major solutions to a very large and complex problem at low cost.

OUTCOMES

The findings are based on the indicators developed for this evaluation, discussed in the section on instruments and methodology in Volume I, and reflected in the questions used for the survey of all stakeholders. Even though only 11 people involved in project activities answered the survey, the findings are robust as they also draw upon the interviews, which followed a similar format and were conducted with over 25 participants from the support groups and over 100 micro and small producer members.

A total of 6 CI out of 19 CIs initiated were visited in 2010; the co-investigator had visited all eight CIs from the first phase in 2006 and 2008. Four out of the six CIs visited for the evaluation have been supported over two phases and so had a longer history of interventions; and the two others that were visited, though started more recently, also showed similar positive results. From the eight CIs in the first phase, four demonstrated highly positive results in the 2010 review, two others appeared to indicate successful outcomes from reports; on one (vegetable seeds) new information is lacking and one (sisal) appears not to have worked out. From the 11 in the second phase, only 2 were reviewed and both (textile and gem stones) showed similar outcomes, which are discussed below. One on biofuels appears to have been unsuccessful. The evaluation does not have any firm conclusions on the remaining 8 CIs, but based on results from similar CIs in phase one, and similar CIs in Uganda that were visited, the evaluators believe that useful outcomes are likely.

Table 3.3: Summary of CI outcomes

CIs	At End of Phase 1	At End of Phase 2
Phase 1–8 CIs	Positive – 4 Potential – 3 Unsuccessful –1	Positive – 4 Dormant – 3 Unsuccessful – 1
Phase 2–11 CIs		Positive – 2 Promising – 4 Unknown – 4 Unsuccessful – 1

OUTCOMES AT THE LEVEL OF THE FIRMS; ECONOMIC OUTCOMES

Overall we can say based on the details provided for the different clusters in tables 1 and 2, that many clusters and member firms have shown positive outcomes for economic development. In all CIs that were visited in Tanzania during this evaluation, almost all firms

involved with clusters reported that their income from their economic activities is higher now, than earlier income before the clustering initiatives began. The mechanisms for higher income and economic benefits can be attributed to several innovative activities[30] that were undertaken.

1. New products were developed that created additional revenues, for example in the seaweed cluster: new ways of serving seaweed as a tasty food; new products such as seaweed soap, where a few bars of soap earn as much revenue as one kilogram of seaweed.
2. New ways of working that led to increased productivity, e.g. in textiles and garments and mushrooms.
3. Increased access to markets because the existing groups worked cooperatively and did joint input purchase, joint sales, and worked together on larger orders in sectors such as textiles, stoves and mushrooms.
4. Improved quality and standards have, in some cases, increased the value added, and increased and provided for new markets, e.g. in the gemstone industry.
5. Outputs from local agricultural products and natural resources have increased, such as in mushrooms, gemstones.
6. Where the resource base is natural, as in seaweed, there is increased recognition of the need to protect the environment. This has become a priority among cluster members who depend on that natural resource base such as in seaweed, and this is also the case for the tourism clusters and for many agriculturists.

GENDER OUTCOMES

Worthy of mention here is that most of the clusters are pro-poor initiatives, especially for disadvantaged segments such as women. For instance, for mushroom, seaweed and the contract farmers for the vegetable seeds, most active members are women. Women also dominate the Nutriceticals and Vegetable and Fruit clusters. Even the metal cluster, which is dominated by men, produces technologies that to a large extent cater to rural women by the way of reducing their drudgery. For the Cultural Heritage and Tourism cluster, most food vendors and processors are women. The impacts on women in CIs, where large numbers of workers and cluster members are women, includes a significant feeling of empowerment through additional income, as well as the acquisition of new skills and responsibilities.

[30] Note these are local innovations rather than first in the world.

UNIVERSITY AND RESEARCH OUTCOMES

Only three people from the University answered the survey. That in itself, given the high ability and potential interest of university stakeholders, suggests a relatively low degree of impact on the University. All three who responded mention positive outcomes such as change in their own thinking, capacity to better understand the needs and solve problems of end users, cluster members and firms being important. They suggest some change in their research orientation, learning to adapt and use innovative ideas in their own work and increase the level of team and interdisciplinary work. On the other hand, while there were many statements of intent of how the researchers planned to contribute to some clusters such as mushrooms, textiles, food, and others through more focused problem solving research, no such outcome was observed, and it could be said that this is a potential that has not yet been achieved.

University-based, R&D intensive cluster initiatives such as sisal and energy have been unsuccessful. This is in keeping with the theory and general observations in many research studies, including in Tanzania, that there is a general disinterest of local industry to engage with academically oriented research. The private sector relies on simpler technologies and finds alternative means to source these, when required, via imported know-how and equipment[31] and the local university is not seen as a credible source.

The project resources and activities did however provide support to the Technology transfer unit at CoET as the project manager, increased the experiences and expertise at the centre, and provided some needed financial resources for its operation.[32] The work on clusters positioned the CoET as a partner for the new World Bank funded work on clusters that has begun in 2009 but the role that CoET may play in it not yet certain. The low impact on the College of Engineering and the University is also confirmed in the interviews where there was little evidence of the CoET or the University having embraced fully the ideas and small evidence of outcomes for teaching, research and extension at the University.

[31] Cited in the 2004 Bagamoyo conference in Bångens, L. 2004. Clusters of Competence: Forming Successful Alliances between University and Industry, p.161. This is noted as a challenge also in the case studies here on Bolivia and Nicaragua and the new BioInnovate initiative.

[32] It was stated that without donor supported income, the national allocations available annually to the technology transfer centre is less than USD 30,000.

GOVERNMENT POLICY

The two respondents from government organizations who completed all the survey questions appreciated the value of the training and one had participated in project management and a cluster facilitator. They said that the project helped them to solve some end users/firms/cluster problems; change their thinking about required policy support. One suggested that "the program could have been at the national level rather than being hosted at a specific institution as a personal program." They thought that the project helped "only in a small way", to influence government perspectives. At the local level, the programs have been more successful in specific instances in securing support of local and national bodies and these are noted in the cases above. In our judgement the project influence on the government and relevant agencies has been low. The examination of workshop participants shows the participation of many government representatives but their presentations suggest that the participation was more ceremonial, and not very substantive.

OTHER PARTNERS

The Tanzania Private Sector Foundation (TPSF) is implementing an "Enterprise Development Programme", a component of the Private Sector Competitiveness Project (PSCP) funded jointly by the World Bank (with IDA, DFID and DANIDA funds). The programme has several sub-components[33] and one of them is a "Cluster Competitiveness Program" (CCP). The aim of the three-year program[34], is to strengthen selected, geographic, industry clusters and address the challenge of low Small and Medium Sized Enterpsise (SME) competitiveness through value chain analysis. CCP has

[33] There is a matching grants program to provide assistance to firms to improve management systems, production techniques, marketing, skills, and technology. A Technical Innovation and Applied Research Scheme (TIAS) is aimed to develop a market for services provided by technical institutions and vocational schools, for training courses primarily technical, delivered to either individuals or private firms, in identified skill gaps. There is a program to provide around 500 awards in sizes of one to fifteen thousand dollars (US), to entrepreneurs with business ideas and start-up firms with risk grants, thereby enabling them to either start or upgrade a business. TPSF also manages a separate EMPRETEC programme of the United Nations Conference on Trade and Development (UNCTAD), which has an Entrepreneurship Training program to promote innovative and competitive Small and Medium Sized Enterprises (SMEs).

[34] It was initially designed for five years, but procurement delays have prevented activities for the first two years.

selected three clusters on the basis of economic impacts anticipated, potentials for growth, and presence of industrial leadership. They are to include – horticulture; food processing and value addition in many sub-sectors such as processing and preservation of meat, fish, fruits, vegetables, edible oils and fats, dairy products, honey, spices, grain mill products, and the manufacture of bottled and canned soft drinks, fruit juices; and tourism, to build on local assets. The program plans to provide technical assistance and training, improved linkages at all levels of the value chain to attain increased revenues, exports, incomes, jobs and productivity. This new program is closely allied to the CIs, and work supported in the ISCP and the CoET is also linked to the project management team through agreements. In the discussions it did not appear that the initiative was an outcome of the earlier cluster activities in the country but an independent and parallel activity that emerged from the ongoing interest of the three donors involved to promote economic activities and competitiveness in the private sector in the country.

ACHIEVEMENT OF OTHER GOALS AND OBJECTIVES

It was found that the focus of the work done has been primarily on the second objective of the program – the implementation of pilot cluster initiatives. There has also been a reasonable degree of attention towards the objectives of awareness creation and publications – though the majority of publications are compilations of workshop proceedings, where the event and its record have been given greater emphasis and the quality of the analysis and reporting not given much attention. While there were annual meetings and many papers presented, the efforts could have been more systematized, and additional opportunities, such as linking to the cluster website of the TCI were missed. Competence building for facilitators and the coordination of programs and activities, linkages between CIs within and between countries, and follow up forums have also been carried out. But often, linkages within CoET and across the UDSM, and with students, have been missed. Linkages with a number of relevant private sector actors and NGO members, who are active or relevant to some of the CIs are also sometimes missing.

CONCLUSIONS

Overall we can say that based on the field visits and interviews with the sample of different clusters visited (in tables 1 and 2), the positive outcomes reported by many clusters and member firms on economic indicators have been the most impressive achievement of the work done in Tanzania. At the same time as promoting innovations, the projects also offer positive evidence of innovations that are incremental and only new to the firms and economic agents involved. It has been almost impossible to generate research based innovations, at least within the few years of this experiment and with the very small resources provided for each cluster.

The most significant shortcoming of the project (shared with others in the portfolio) is the lack of attention to a robust M&E system that would allow the very different stakeholders, with very different incentives and priorities, and the National Steering Committee, to know jointly and learn what was working and what was not, then to respond quickly by making necessary adjustments to both project design and implementation plans. Even now, as the reports do not talk about certain clusters, which appear not to have worked, there is no learning on why they did not. Successes in the CIs require multiple conditions to be present and our examination suggests that among them the leadership available to the CI – both internal and external through the individual facilitators is one key element. The correct analysis of the challenges facing the firms and a successful determination of "quick wins", within the resources available is certainly another key element. Then the financial resources to solve identified bottlenecks must flow within a reasonable time period, and that was often not the case. The market conditions are certainly very important and a positive market demand, and the capability of cluster members to meet demands with a small amount of additional inputs is another necessary condition. In the successful case of the seaweed cluster, while the ability of the group to add value added products was a notable success, changing the market conditions for seaweeds to increase exports has not been successful. Ultimately without this information, the project has often focused on activities – increased numbers of clusters supported, training provided, and workshops and meetings, that did not always contribute to the goals and outcomes.

Without suitable baselines and monitoring of cluster improvements and challenges, the lack of timely, effective and adequate interventions can remove adverse effects and improve the results of all cluster projects will remain. The new 2010 final project report states that there were plans to refine and pilot test the M&E instrument. It is not clear why this has been so, given an extensive and detailed plans laid out in the Bagamoyo conference (see pp. 67–70), the two pilot evaluations undertaken at Sida initiative in 2006 and 2008; the effort begun with the survey of cluster facilitators in 2008 and the summary prepared by Ffowes-Williams on weaknesses within clusters and the need to strengthen the National Steering Committee. In the interviews it was stated that ongoing evaluations of the clusters had always been planned, but had never got off the ground.

Effective management of the cluster initiatives require a number of serious challenges to be met simultaneously. There is a need for higher level of coordinated actions that include – continued need for capacity building and training that build on previous achievements and needs that are specific to each cluster and the to the different types of actors – entrepreneurs, managers and workers in the productive enterprises, researchers, academics and government agencies and also the required level of support within the coordinating agency.[35] The majority of cluster members wish for training focused on relevant and applicable knowledge and skills as opposed to "academic" skills, that they can apply in their own contexts. This requires a good understanding of the specific requirements by cluster and over time and requires systematic follow up and mentoring.

A new phase has recently been approved by Sida to begin in 2011. The coordinating entity has changed and will now be the Tanzania Commission for Science and Technology (COSTECH), thereby moving the coordination to a higher and national level. The proposal calls for starting 14 new CIs, and it is anticipated that the new ones would be further afield and not necessarily close to UDSM. This has the potential advantage of allowing greater national visibility, access to and interactions of the CIs with a wider set of support

[35] The Training Needs Assessment Report, April 2009, p. 9, suggests that there is a need for a stronger links between the clusters and CoET through regular outreach services, and most members felt a need for a full-time officer to be fully responsible for the cluster activities. Also that there is a need for ongoing training and capacity building. A number of CIs, in particular engineering and textiles, suggested that student internship programs would be useful.

organizations and improved policy support. Problems that are well known for the firms such as lack of capital, infrastructure, and supportive policies could receive greater attention through the new organisational home. It allows for better interactions with the donor funded cluster initiatives being undertaken with much larger financial resources through the Tanzania Private Sector Foundation (TPSF). There are a number of risks going forward that need to be recognized. The most important are the efficiency of the new arrangements for coordination; the fact that the initiatives have rested on voluntary contributions of facilitators, with strengths and weaknesses of that; and the relatively low integration of the activities with the UDSM structure. A number of steps that can increase effectiveness in the future – on training, capacity building, follow up, and coordination have been highlighted in this study, the survey and in the earlier reports that have been cited – need to be given greater attention.

In a longer term perspective, the issues of financing the activities – at CoET and the University, now that the program management has moved to a national level, would be a potential risk for the University, and the joint objectives with Sida to make the University knowledge more available to economic agents. At the level of the cluster firms, the nature of new market opportunities, their size and growth, as well as opportunities to finance both the types of support provided so far, as well as financing of enterprises for the increased scale and investments, are clearly critical for ongoing success.

SURVEY RESULTS: ISCP-TANZANIA

Sample

The electronic survey was sent to 40 individuals and made available for respondents between 16 November and 17 December 2011.
It was answered by 11 people, of which three were from the university, two from government entities, three from a business association, one from a research institute, one from a firm, and one from a support organization. The numbers are too small to provide confidence in their quantitative value but the responses provide additional support to the qualitative findings from the field interviews.

Table 3.4: Respondents to the survey on the Sida Strategic Evaluation of Innovation Systems – ISCP- Tanzania

		No.	%
No. of people that received the survey		40	100.0
Total answers		11	27.5
Gender	Female	3	27.3
	Male	8	72.7
Age	Below 35	0	0.0
	36–45	0	0.0
	46–55	7	63.6
	Older than 56	4	36.4
Level of education	Primary	0	0.0
	High School	1	9.1
	Diploma	1	9.1
	Bachelors	1	9.1
	Masters	2	18.2
	PhD	6	54.5
Discipline	Natural Science	1	9.1
	Engineering	6	54.5
	Medicine or health	0	0.0
	Social Sciences	1	9.1
	Public administration	0	0.0
	Education	0	0.0
	Business and Commerce	3	27.3
	Other	0	0.0
	No information	0	0.0
Kind of organization	University	3	27.3
	Research Institute	1	9.1
	Government Organization	2	18.2
	Firm	1	9.1
	Financial Institution	0	0.0
	NGO	0	0.0
	Workers Union	0	0.0
	Business Association	3	27.3
	Other	1	9.1

PARTICIPATION

Of the three respondents from the university only two answered almost all questions. They participated as cluster facilitators, but only one reported on workshops and training to increase their capacity to transfer knowledge, providing training to others to transfer knowledge, on creating networks, links and alliances with other universities and research organizations and providing services to productions firms. (See Table 3.5). The two from governmental organizations participated on creating networks, links and alliances with universities and with research organizations, and one person also participated as project manager and cluster facilitator, in workshops and training to increase his capacity to transfer knowledge; and provided training to others. Of the four respondents from business associations and other institutions, only two participated in workshops and training to increase their capacity and also worked on creating networks, links and alliances with the University, firms, research institutes, government and others.

Table 3.5: Q12. I participated in the following ways:

	No.
Project management	0
Cluster facilitator	2
In workshops and training to increase my capacity to transfer knowledge	1
Provided training to others to transfer knowledge	1
Worked on creating networks, links and alliances within the University	0
Worked on creating networks, links and alliances with other Universities and Research Organizations	1
Provided services to production firms	1

IMPACTS ON UNIVERSITY RESPONDENTS

Getting involved in the project helped them to better understand the needs and solve problems of end users, cluster members and firms as documented in table 4.3. Two respondents changed their research orientation by "focusing on a grassroots approach and applied research"; producing "more research activities in nutraceuticals and functional foods"; but for one person the effect of the program was very direct: "the idea of innovation was there but there was no platform to implement it until I joined ISCP". All three university based

respondents said they learnt to adapt and use innovative ideas in their own work and increase the level of team and interdisciplinary work. "Value addition was possible through the ISCP" and in another "innovation ideas accumulated during research have been transformed into a small innovative firm, which deals with development, manufacturing and marketing of nutraceuticals and functional foods". Finally, for all respondents, this increased their level of team and interdisciplinary work as they found that "by sharing resources it is possible to do more than when doing it alone". Another said: "I have been working with researchers from other departments of the University (Department of Commerce and Management), pediatrics, food scientists, sociologists, agronomists, and others," and "the idea of innovation helped me to join with other researchers working with community outreach projects to implement some of my planned innovative activities. Through ISCP I was able to make members and firms in my cluster initiative to work together; something that was not there before". (See Figure 3.1 and Table 3.6)

The responses suggest that the role of participants could have been more effective if they could attend cluster facilitation course/training, if funding was more continuous, and if there had been enough raw materials and a good number of members to coordinate. Also, the worst difficulty that they had in making contributions was the lack of financial resources, followed by lack of time (See figure Y2). Only one of the respondents points out administrative issues were a significant difficulty. One person added that "there were no enough members to coordinate, most of companies expected to take

Figure 3.1: Q.13–17. My involvement helped to increase my own capacity to:

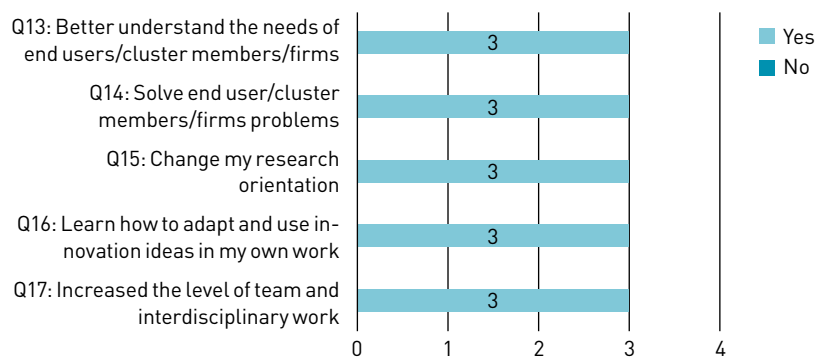
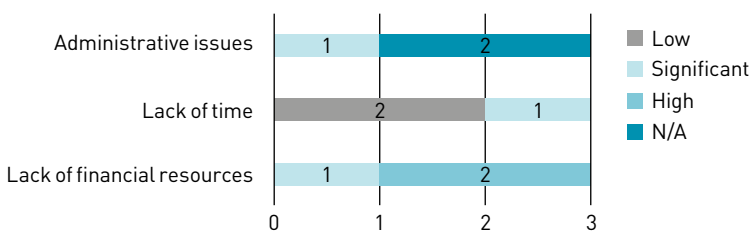


Table 3.6: Examples of how involvement helped them to increase their own capacity (all comments are as provided to the question)

Question	If yes, explain
Q13: Better understand the needs of end users/cluster members/firms	Cluster members, processors in particular, had little knowledge of the processing of *nutraceutical* crops such as soybeans and *moringa oleifera* leaves. Through my involvement they were introduced to best practice processing, handling and storage techniques, and understanding their products better.
Q14: Solve end user/cluster members/firms problems	It was easier for me to reach out to the cluster members, learn, and understand their needs. Through creation of initial trust cluster members were more open to talk about their needs and reduce lack of resources and raw materials, and to working as a team.
Q15: Change my research orientation	Focus on grassroots (down-up) approach and applied research. I would say Yes and No because the idea of innovation was there but there was no platform to implement it until I joined ISCP. More research activities in *Nutraceuticals* and Functional Foods.
Q16: Learn how to adapt and use innovation ideas in my own work	Although I was already working with innovation of the production systems, the aspect of value addition was possible through the ISCP. Always looking on how to solve problem with minimal resources. Innovation ideas accumulated during research have been transformed into a small innovative firm founded and owned by me. The company deals with development, manufacturing and marketing of *nutraceuticals* and functional foods.
Q17: Increased the level of team and interdisciplinary work	By sharing resources from members, it is possible to do more than when doing it alone. Have been working with researchers from other departments of the University (Dept. of commerce and management), pediatrics, food scientists, sociologists, agronomists, and others. The idea of innovation helped me to join with other researchers working with community outreach projects to implement some of my planned innovative activities. Through ISCP I was able to make members and firms in my cluster initiative to work together; something that was not there before.

Figure 3.2: Q19: The greatest difficulty you faced in making contributions were due to:

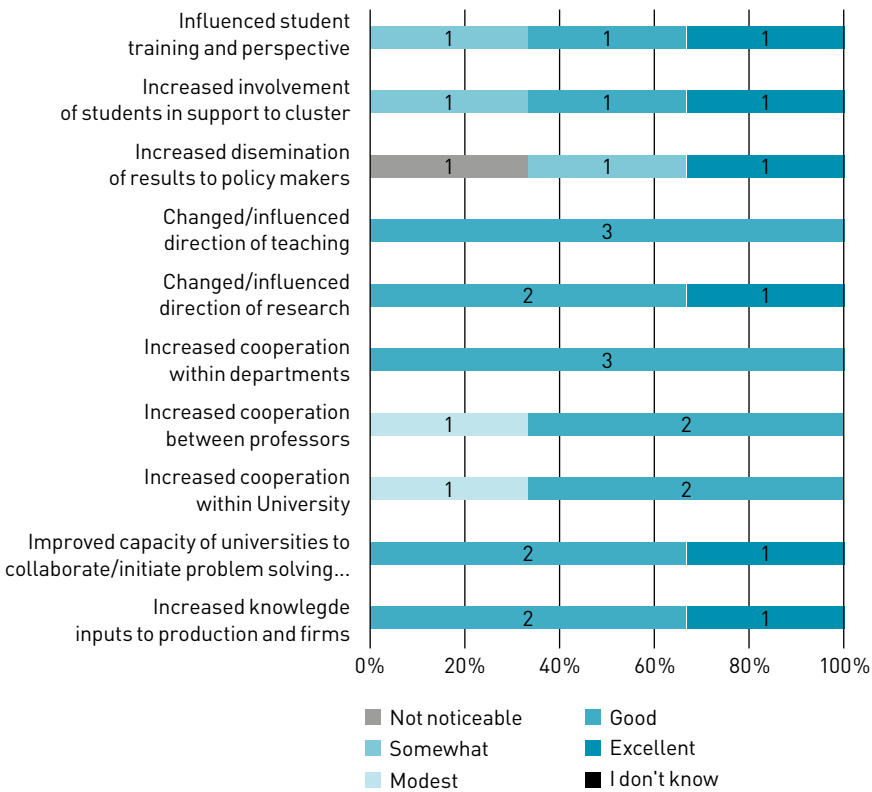


part were big fuel companies and were not interested in cluster issues.

Based on their experiences, the three respondents found that this project was between "a good and an excellent way" to increase knowledge inputs to production and firms, and to improve capacity of universities to collaborate/initiate problem solving/R&D projects. Increasing cooperation within university, between professors and within departments were considered less good, as well as changing/improving direction of research and teaching. In other areas, there was no consensus between people surveyed. (See figure 3.3)

For the respondents, the organization of the project could be improved if "inter-department collaboration is increased and topics related to cluster challenges was made part of research with funding from the university or government funding/training in marketing related aspects", and by "setting up an active leadership involving entrepreneurs who seem to have champion potentials for the development of the cluster, including facilitation and involved

Figure 3.3: Q.20. Based on your own experience, do you think, the project has helped to:



(fewer) people elsewhere, who are busy with administrative issues and therefore have little time for the cluster". Moreover, if: "the initial stages of project identification started with a bottom-up approach by first identifying business activities with enough members, and a their priority needs for coordination, followed by studying needs of individual and group members and the "qualifications" for entry into a cluster program".

The achievements reached that were mentioned include: better quality products of cluster members (they now can sell them in some shops and supermarkets), higher sales, "Production of a value-added product (seaweed soap) for the first time" and cluster members have become aware of the services they can get from the university; The CI enabled cluster firms to work together, something that they never did before, allowing "firms and members to learn, apply, and acquire funds." In one case, the respondent said that there were no achievements to report in his case.

IMPACTS ON RESEARCH INSTITUTES

Only one respondent from this category completed this survey. He participated as a facilitator in the project and said that the ISCP-Tanzania helped him to better understand the needs of user and "problems of clusters", to solve user problems by "discussing and giving alternative solutions", and to learn how to adapt and use innovation ideas in his own work by "understanding differences between design phase and actual implementation". Also, it changed his research orientation and allowed him to increase the level of team and interdisciplinary work by "providing suggestions of technical expert to untie problems". The respondent thinks that the capacity/role could have been more effective with more financial resources.

The respondent said that the experience showed that the project helped in a *good* way to increase knowledge inputs to production and firms, to increase cooperation between researchers and influence research training and perspective; and in *an excellent way* to increase involvement of researchers in support to cluster. Nevertheless, any increased cooperation within research departments was moderate and the direction of research did not have a noticeable change. The respondent thought that there have been improved outcomes in "areas of metal engineering like foundries" and felt that to increase the benefits it may be necessary to "engage consultants in competitive manner and with a reasonable fee".

IMPACTS ON GOVERNMENT ORGANIZATIONS

Two respondents from government organizations completed all the survey questions. Both said that they had worked with ISCP-Tanzania on creating networks, links and alliances within the university and with other universities and research organizations, and one had participated in project management and as a cluster facilitator. He participated in workshops and training to increase his own capacity, to transfer knowledge and provided services to production firms. They stated that the ISCP-Tanzania helped them to better understand the needs of end users/cluster members/firms by "identifying the technology gaps between the end users and technology developers", and "innovating working methods for heritage management institutions such as the National Museum of Tanzania and Antiquities Division".

The project also helped them to solve end users/firms/cluster problems; where they found important "the use of an participatory approach in the creation of trust among cluster members" and "technology identification and issues relating to IPR awareness." The project also helped them to change their thinking about required policy support. They pointed out that it is important to include "innovations systems in the new STI policy and also inclusion of innovation clusters, incubators and science parks in the National Strategy (MKUKUTA II)". They said they learned how to adapt and use the innovation ideas in their own work and "how to upscale the cluster idea into other sectors and geographical areas". It also allowed "involvement of key players" and increased the level of team work and cooperation by "enhancing dialogue and openness among staff".

They noted that financial resources, administrative issues and their lack of time were all difficulties for their improved contribution. One recommended that "the program could have been at the national level rather than being hosted at a specific institution as a personal program." They thought that the project helped, but only in a small way, to influence government perspectives, but was more successful with other issues. They noted achievements as: the CI "won several tenders for design and installation of exhibitions in Bagamoyo, Kondoa, Iringa, Ujiji Kigoma and Dar es Salaam (TCRA Communications Museum); CI was consulted by individuals and local authorities e.g. Bagamoyo District Council for establishment of a museum on history of Islam; and the Cultural Heritage Tourism Clusters will have a budget line from government

and operate with reduced dependence from donors." Suggested improvements were to "better profile the success achieved by the Bagamoyo Cultural Heritage Tourism Cluster at forums involving government decision makers" and "other key stakeholders".

IMPACTS ON FIRMS

Only one firm completed the electronic survey. The respondent stated that he had contact with the Arusha Vegetable Seeds Cluster, but did not complete the rest of the survey. (In all visits to clusters and firms by the evaluators, the questions for firms were used during interviews and in several clusters they were completed for the firms present as a group. Those results are provided in the report.)

IMPACTS ON OTHER STAKEHOLDER ORGANIZATIONS

Five respondents were from this category but only three stated that they had contacts with ISCP- Tanzania while two skipped the question. Of the three, two were facilitators, one as "a facilitator of the Dar Es Salaam Building Construction Cluster Initiative", and the other was "facilitator for Tanga Cultural and Heritage Tourism Cluster". They completed all the questions. They participated in workshops and training; worked on creating networks, links and alliances with the University, firms, research institutes, government and others. Only one of them provided training to others. One said ISCP-Tanzania helped to provide: "a clear understanding of clustering initiative, the importance of these initiatives, formation of a cluster in cultural and heritage tourism, networking and contacts with other clusters in Tanzania, and exchange of information, ideas and visits to other clusters from Uganda and Mozambique" and "training and financial support for the cluster initiative, benchmarking and networking with others."

The involvement has helped them with: "exchange of knowledge on clustering, cooperation of related firms in a cluster by raising productivity and specialization than firms working in isolation, the idea of competitiveness, but at the same time cooperation, to promote growth in the same industry, increasing revenue and a win-win situation for all stakeholders"; and "cluster facilitation, identification and development of a cluster, networking, collaborating competitively and strategic management of economic clusters." The project was useful for their organization because "it created a conductive business environment that could not have been easily achieved through the Association", and, to make ISCP-Tanzania work better they suggested:

"institute training workshops for cluster members on a variety of issues depending on their training needs and exchange program to cluster members to other similar clusters, where applicable a global exchange visit to successful clusters," and "ISCP-Tanzania should coordinate the exchange of information as well as collaborative efforts between clusters as well as other stakeholders in the triple helix, and should support the cluster and the facilitators financially."

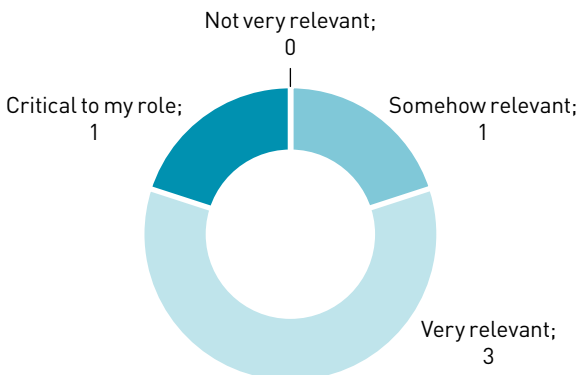
FACILITATOR EXPERIENCES

Five facilitators answered this special section and said they had worked in the following clusters:

- Bagamoyo Cultural Heritage Tourism Cluster
- Biofuel cluster in Dar es Salaam and Morogoro
- Building Construction Cluster Initiative, Dar es Salaam
- Seaweed Cluster
- Tanga Cultural and Heritage Tourism Cluster

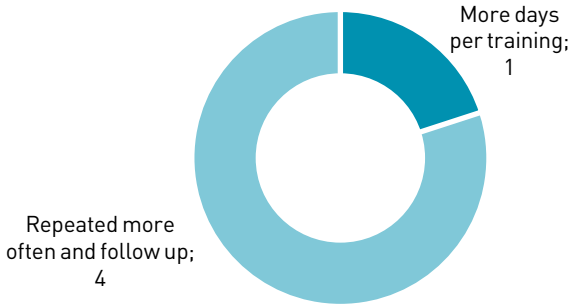
All confirmed facilitator training between 2005 and 2006. Most said the training was very relevant to their participation. (See Figure 3.4). It allowed: "to understand clustering dynamics and linkages, the Triple Helix cooperation, to recognize the cluster actors and gave confidence to act as a facilitator", "it gave an idea of how to facilitate a cluster initiative and put innovation into practice", and "it opened (us) to the challenges of working with people with different interests and educational levels". For one of the respondents, the training was critical for his role, because "he had no prior knowledge as a facilitator". For other respondent the training was just somewhat relevant for his role because "there were no members to coordinate and not enough demand for the business".

Figure 3.4: Q.82: How important was its relevance to your facilitation role?



Most thought it was necessary to repeat the training and also follow up on the training of facilitators in the future. They said that topics that needed more attention are: "strengthening innovation and clustering, and identification of clusters actors", "business management skills, record keeping, preparation of business plan and trust building, and concept of low hanging fruit", and "identification and qualification of a business sector for clustering".

Figure 3.5: Q83. In your opinion, are there aspects that could improve the training of facilitators in the future?



Overall, the five facilitators rated that their capacity was used *well or very well* to build trust, linkage within and across clusters, and to access markets. But they had more varied experiences of outcomes on building linkages with the University, government, and with regard to accessing finance and other inputs.

Figure 3.6: Q84–91. How was your capacity utilized to improve the performance of your cluster in relation to the following:

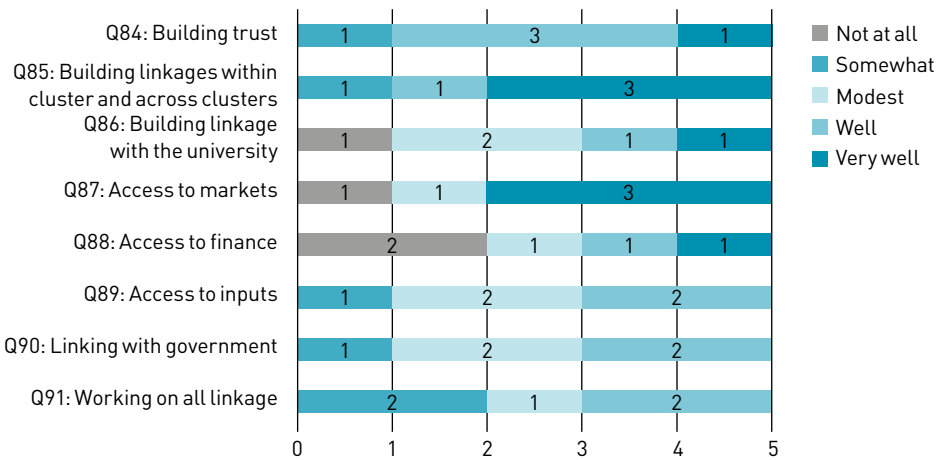


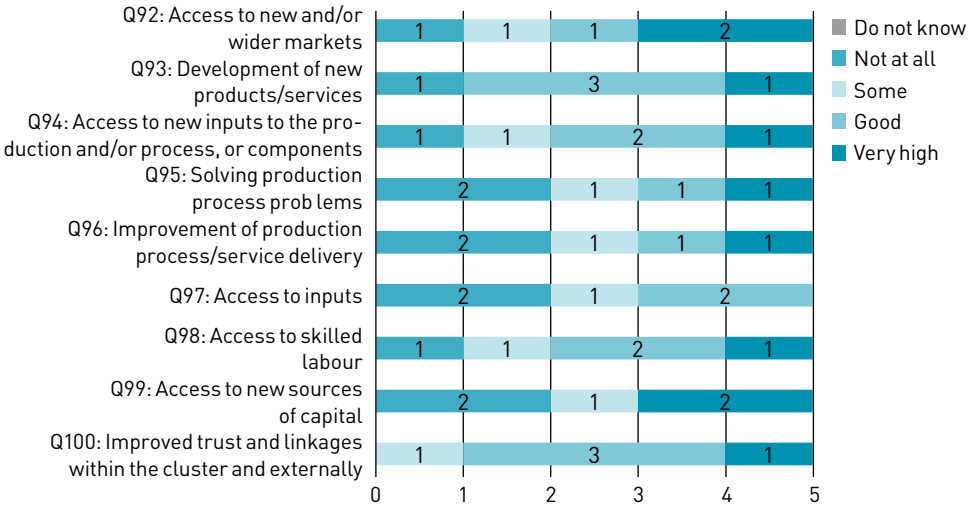
Table 3.7: Explanations of how capacity was utilized to improve the performance of their cluster in relation to the following aspects:

Question	Explanations
Q.84: Building trust	I was able to make the cluster members trust each other, trust the facilitator and link very well to the Triple Helix within the cluster. Initial cluster members are still with the cluster. Members from the outset understood the need to have trust on each other. The process of building trust requires creating awareness and identifying the activities that were beneficial but involved low risk as ground for building trust.
Q.85: Building linkages within cluster and across clusters	Cluster members needed each other to provide tourists with needed requisites, hence the cross border linkages. Constant exchanges with cluster members and between clusters e.g. between Bagamoyo cluster and Tanga Cultural Heritage Tourism cluster. I was able to make cluster firms and members work together in exchanging materials that they need, train each other through inter-firm trainings and using some common resources together. Knowledge of the industry was key to identifying area of common interest and benefits.
Q.86: Building linkage with the university	Although we enjoy a close link with the University of Dar es Salaam, my Cluster is yet to seek technical solutions from the University or other technical institution. We see the potential however of collaborating in future. Being a member of the academia, I made it possible for cluster firms and members to come freely to the university and meet me and other scientists. History Department University of Dar es Salaam trained tour guides of Bagamoyo Cultural Heritage Tourism Cluster. Not done yet.
Q.87: Access to markets	Some of them had markets already and I helped them get more markets. The market is available but still new; the city is yet to be a destination. Through production of promotion materials (DVD and brochure), participation in International Trade Fairs and linkages established with Tanzania Tourism Board and Tour operators. We have been able to identify the potential markets for the cluster and where we are focusing our activities.

Question	Explanations
Q.88: Access to finance	Cluster members are not yet bankable; access to loans from these institutions is risky business to them. Cluster members depend on their own capital to do business. Few firms have been able to secure finances and to expand the businesses through quality products and services. I was able to assist three firms to get funding through exposing them to funding agents. Through the cluster and support of the Association, banks are now providing special products to our members.
Q.89: Access to inputs	Firms were getting inputs from the same sources that they are getting now but access to inputs for innovated activities and products was obtained with my help. The cluster has attracted suppliers and created trust that has led to establishing credit facilities/relationships. Women's groups of the cluster secured fishing boats, equipment and machines for their businesses from national programs and Collage of Engineering and Technology.
Q.90: Linking with government	Cluster recognized and supported by the Bagamoyo Local Government Authority. Good relations and support from all regulatory bodies involved in the building industry as well as some of the key ministries. No significant issue has cropped up that needed government intervention. However, cooperation with some departments going on and gives support. Some firms were already getting help from government departments but I linked them to new departments that are useful to them.
Q.91: Working on all linkage	Linkage among cluster members and across the cluster and even with other SMEs is commendable. Not much linkage established with big businesses e.g. operators of tourist hotels in Bagamoyo. The Triple Helix was realized under my facilitation and inter-firm collaboration was created under the cluster initiative. We are yet to establish sustainable relationships with other clusters.

The facilitators think that the cluster improved trust and linkages within and outside itself, and helped the development of new products and services. However, the performance in the access to new and/or wider markets; solving production process problems, improvement of production processes/service delivery, and the access to inputs, skilled labour and new sources of capital, varied between the different clusters.

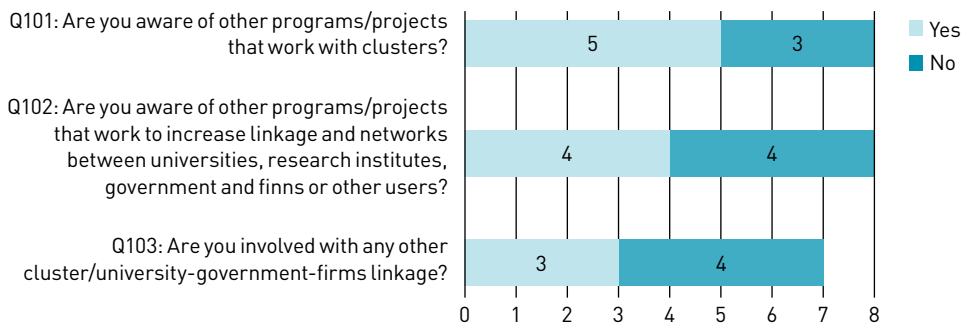
Figure 3.7: Q.92–100. Views on the impact of the cluster program on the specific cluster(s) you facilitated



OTHER CLUSTER EXPERIENCES

Only five of the eleven Tanzanian respondents were aware of any other clusters; of them four were aware of other examples of work to increase linkage and networks between universities, research institutes, government and firms, and three were involved with other cluster linkage. (See Figure 3.8 and Table 3.6).

Figure 3.8: Q101–103. Other experiences



DOCUMENTS CONSULTED:

ACDI/VOCA, "A Bountiful Harvest from the Sea: Seaweed Farming Brings One Woman a World of Benefits" at – http://www.acdivoca.org/site/ID/SEEGAADseaweedfarmersuccessstory

CoET (2009), "The Sixth Regional Conference on Innovation Systems and Innovative Clusters in East Africa(ISCP-EA) and First Regional Conference on Pan African Competitiveness Forum, Eastern Africa, Chapter", Proceedings, Dar-es Salaam, Tanzania

COSTECH (2009), "Strengthening Academia-Government-Industry Interplay Capacity to Support Development of Innovation Systems and Clusters Program in Tanzania"

Diyamett, B.D. and A.A. Komba, (2006), "Tanzania Cluster Initiative Project: An Evaluation Report from the Eight Cluster Initiatives", ATPS-Tanzania

Diyamett, B.D. and A.A. Komba, (2008), "Tanzania Cluster Initiative Project: An Evaluation Report from the Eight Cluster Initiatives", ATPS-Tanzania

Diligent Consulting with Miradi, Training Needs Assessment Report, Business Management Skills Training for Clusters Leaders and Cluster Firms Under the Innovation Systems and Clusters Programme (ISCP) in Tanzania April 2009

Diligent Consulting with Miradi, Training Manual: Business Management Skills Training for Clusters Leaders and Cluster Firms Under the Innovation Systems and Clusters Programme (ISCP) in Tanzania

Ffowcs-Williams, I. (2008), "ISCP-East Africa Facilitators Survey"

ISCP-EA, "Innovation Systems and Clusters Program, East Africa: An Information Brochure"

ISCP-EA,"Innovation Systems and Clusters Program, East Africa (ISCP-EA): An Information Pamphlet".

Mwamila, B.L. (2009),"Application for Planning Funds for Research Based Innovative Cluster Development in Africa by the Pan African Competitiveness Forum (PACF)"

Mwamila, B.L., B. Nawagwe, C. Lucas, and L. Trojer,"Research Based Innovation Development in Africa (2009–2012): A Proposal to Sida"

Mwamila, B.L. and L. Trojer, (2009), "Application for Swedish Cooperation Support to Research Based Innovative Cluster Development in Africa by the Pan African Competitiveness Forum (PACF)"

Mwamila, B.L. and A. Temu, (2005), "Innovation Systems and Clusters Program in Tanzania", Proceedings of the National Stakeholders Workshop, Bagamoyo, Tanzania

Mwamila, B.L. and A. Temu, (2006), "Innovation Systems and Innovative Clusters in Africa", Proceedings of the Launching Workshop on Pilot Clusters Initiative, Dar es Salaam

Mwamila, B.L. and A. Temu, (2006), "Innovation systems and Innovative Clusters in East Africa", Proceedings of the 3rd Regional Conference on Innovation systems and Innovative Clusters in Africa, Dar es Salaam, Tanzania

Mwamila, B.L, L. Trojer, B.D. Diyamett, and A. Temu, (2004), "Innovation Systems and Innovative Clusters in Africa", Proceeding of Regional Conference, Bagamoyo, Tanzania

Nawangwe, B. "Innovation Systems and Innovative Clusters in Uganda: Strengthening University Staff to Support the Development of Innovation Capacity and Innovation Clusters in Uganda"

Sida (2007),"Continued support to the Pilot Phase of the Innovation Systems and Clusters Programme (ISCP) in Tanzania", Memo

Sida (2006),"Continued Support to the Pilot Phase of Innovation Systems and Clusters Program (ISCP) in Uganda", Memo, November

Yussuf, I. (2009), "Low seaweed prices discourage farmers", Zanzibar News, 25th April

LIST OF INTERVIEWEES – TANZANIA

Name	Organization	Role in ISCP
1. Abraham Temu	CoET	National Steering Committee
2. Leila Jumbe	Entrepreneur	Facilitator- Kilindi Small Scale Gemstone Mining
3. Osca Kibazohi	CoET	Facilitator-Biofuel
4. Joel Norbert	CoET	
5. Enock Masanja	CoET	Facilitator- Sisal Cluster
6. Davis Baitani	Entrepreneur	Facilitator
7. Arnold Towo	CoET	National Steering Committee
8. Malima Bundara	Entrepreneur	Secretary-Educational Cluster
9. Omar Mzee	Sida-Tanzania	
10.Ezekiel Mwaikono	Kibaha	Facilitator-Cassava Cluster
11. Flower Msuya	Institute of Marine Science-UDSM	Facilitator- Seaweed Cluster

Name	Organization	Role in ISCP
12. Ranson Lema	Entrepreneur	Member-textile cluster
13. Rose Makoyola	Entrepreneur	Member-textile cluster
14. Flotea Masawe	Flotea marvelous Ltd.	Facilitator-textile cluster
15. Doreen Jacob	Flotea marvelous Ltd.	Member-textile cluster
16. Subilaga Kalowa	Fort Processing and Supplies	Member-Neutraceuticals Cluster
17. Dr. H. Mshinda	COSTECH	National Steering Committee
18. Justin Stokes	TPSF	Similar program
19.Hayley Alexender	TPSF	Similar Program
20. Samwel Asman	Entrepreneur	Facilitator-Mushroom cluster
21. Leonard Mwaikambo	CoET	Facilitator, textile cluster
22. Jamidu Katima	CoET	Principal, CoET
23. Burton Lunogelo Mhamilawa Mwamila	NMAIST; COSTECH; PACF	Project Coordinator; then Principal, COET; now Vice Chancellor, Nelson Mandela African Institute of Science and Technology, NM-AIST, Arusha; Chairman, COSTECH.

ADDITIONAL INTERVIEWS IN ZANZIBAR:

List of participants, Seaweed Cluster Initiative, 27th November, 2010

S/N	Name	Sex	Place/Affiliation
1	Mwanausi Mwalim	F	Bweleo
2	Fatma Ramadhani	F	Bweleo
3	Toum Budda	F	Kidoti
4	Mashavu Aziz	F	Bweleo
5	Amina Khamis	F	Bweleo
6	Bakari Machano	M	Kidoti
7	Hakim Machano	M	Chwaka
8	Ali Mrisho	M	Chwaka
9	Salama Khamis	F	Bweleo
10	Mwanahija Juma	F	Bweleo
11	Mwanaisha Makame	F	Paje
12	Patima Haji	F	Paje

S/N	Name	Sex	Place/Affiliation
13	Safia Ali Jecha	F	Nyamanzi
14	Zainabu Mharami	F	Nyamanzi
15	Fatuma Ramadhani Pandu	F	Bweleo
16	Juma Vuai	M	Kisakasaka
17	Harusi Hamad	F	Kidoti
18	Juma Zaidi	M	Bweleo,
19	Mwatum Juma	F	Bweleo
20	Mwajuma Mwinyi	F	Bweleo
21	Mwanabasi Juma	F	Bweleo
22	Safia Hashim	F	Bweleo
23	Rehema Ali	F	Kidoti
24	Kheri Mussa	M	Bweleo
25	Rajab Ali	M	Min. Of Agriculture
26	Flower E. Msuya	F	Institute of Marine Sciences
27	Asha Ameir	F	Commissioner of research, Ministry of Agriculture
28	Rajab Ali Ameir	M	Extension, Ministry of Agriculture
29	Margareth Kyewalyanga	F	Director, IMS

4 ISCP – Uganda

BACKGROUND[36]

Similar to Tanzania, the history of Ugandan Cluster Initiative program is traced back to the 6th TCI Conference that took place in Gothenburg Sweden in September 2003 and is broadly discussed in the earlier background to the development of ISCP-EA. For Uganda the beginning was the initiation of seven clusters that took place after training of facilitators and planning workshop in October 2005. A total number of 50 individuals were trained[37] who were selected based on prior knowledge, local workshops, and their relevance to the work plans and selected clusters. The objectives of the program were the same as for the regional cluster program: to develop clusters to a level that will enable them to cooperate and optimize utilization of resources for mutual benefits through mutual learning and interaction with the academia and government (policy makers).

The seven first seven clusters are as follows: 1) salt processing, Katwe 2) Katwe metal fabrication, Kampala 3) fashion and textile, Kampala 4) biofuels 5) management consultancy 6) pineapple processing, and 7) basketry processing. After 18 months of implementation these clusters were evaluated and 4 selected for up-scaling.[38]

Given the large interest in initiating and developing clusters in Uganda, fifteen new clusters were identified during the national workshop held in 2006, and plans were made for an 18 months pilot project.[39] The fifteen clusters are as follows: 1) ICT software, Kampala 2) education cluster, Kampala 3) building material, Kampala) 4) furniture cluster, Kampala 5) vegetable seeds, Kampala 6) edible and medicinal mushrooms, Kampala 7) goat rearing, Wakiso 8) fruit and vegetable processing, Luwero 9) fish farming, Kaliro 10) bee keeping,

[36] The field visit and interviews in Uganda were jointly undertaken by Bitrina Diyamett and Amitav Rath. This section on Uganda is prepared jointly by the same members of the team.

[37] For the resources allocated see introduction to ISCP. Ugandan ISCP Progress Report, 2007 to 2010, prepared by national Steering Committee.

[38] National Steering Committee, "Ugandan ISCP Progress Report, 2007 to 2010".

[39] Lindroos, M. 2007. "Continued Support to the Pilot Phase of the Innovation Systems and Clusters Program (ISCP) in Uganda", Sida memo of November 16th.

Lira 11) tree planting, Western Uganda 12) Ugandan robuster coffee, Western Uganda 13) leather processing, Jinja 14) dairy cluster, Southern Western Uganda, and 15) maize millers, Jinja.

MAJOR ACTIVITIES OF THE CLUSTERS

Activities identified for Implementation during the Pilot Phase include the following:[40]

- Mobilization of people and other resources within the cluster initiative and analysis of activities of cluster members.
- Preparation of grounds for and facilitation of implementation of short term activities (low hanging fruits as identified by individual clusters).
- Identification and facilitation of implementation of long term strategic activities such as strategizing on how to Access funds.

Details of such activities are included in plans of different cluster initiatives. Plans have also been evaluated by an international team, largely from VINNOVA. The team evaluated most of the proposals favourably with some minor revisions for some clusters.[41]

FUNDING

Sida provided Makerere University with the total amount of SEK 3.0 million[42] for the period of 1st November 2007 to 30th April 2009, of which SEK 1.5 million is for 2007 and SEK 1.5 million for 2008. The funds were to be divided among the different parts of the program as follows:[43]

	Activity	SEK
1	Bridging funds 4 Cl	580,000
2	Final supp art 4 Cls	60,000
3	15 New Cls	530,000
4	8 Cls (c ontinue d for 6mths)	280,000
5	Visits to Tanzania	190,000
6	Facilitation	410,000
7	NSC & FOT-MAK	440,000
8	VINOVA ADVISORY	510,000
	TOTAL	3,000,000

40 Ibid.

41 VINNOVA and CLUSTERNAVIGATORS, "Feedback on Ugandan Cluster Initiatives Action Plans 2007".

42 Lindroos, M. 2007.

43 Financial Report provided by Makerere University.

OUTCOMES

Outcomes will be discussed at two levels: general and cluster specific levels. General level implies general program level, largely referring to program management. Discussion will refer to existing documentation and interviews during the field visits.

GENERAL LEVEL

In comparison to Mozambique and Tanzania, cluster initiatives seem to have taken roots in Uganda. In regard to cluster management, there is now an established office specifically for the cluster program. The office is manned by 3 full time employees who are handling cluster matters daily. The cluster program also has its own website. The program seems to be well popularized nationally, and is well linked to other organizations in the country. The evaluators (Amitav and Bitrina) were able to visit some of these organizations, including Ugandan Investment Authority, Ministry of Finance and Economic Development and SNV.[44] Interview with individuals from these organizations revealed that collaboration between these organizations and ISCP-U is deepening, and could be long term. For instance ISCP-U has signed a memorandum of understanding with SNV to collaborate on studies and share emerging lessons from both parties in the development of agricultural sector. Some of the existing collaboration include the diary, vegetable oil seeds and pineapples sub-sectors. The Ugandan Investment authority on the other hand is collaborating with ISCP-Uganda in capacity building, especially on business skills. According to the ISCP-U progress report 2007 to 2010, the Authority has already trained – on average – about 30 cluster members. The Ministry of Finance and Economic Development occasionally organizes forums for exchange of information and ideas among various stakeholders involved in cluster efforts and value chain addition; ISCP-U is a party to this. What is even more interesting is the fact that most people interviewed in these organizations showed deep interest in cluster program, and have – to a large extent – grasped the concept of innovative clusters.

In an effort to intensify the role of university in cluster development, the ISCP-U has signed the memorandum of understanding with the Makerere Business School to start students attachments

[44] Stichting Nederlandse Vrijwilligers (SNV) was originally the Foundation of Netherlands Volunteers and since 1990 it has gone by the name SNV Netherlands Development Organisation. Source SNV Website, http://www.snvworld. org/en/aboutus/Pages/history. aspx.

program in which students of Entrepreneurship and Small Business Management will be attached to each cluster to enhance the competitiveness of cluster firms/farms through transfer of business knowledge and skills.[45] As of the time of this evaluation a total of 24 students from the Business School have been attached to the following clusters: ICT Software, Katwe Metal Fabrication, Rubaga Furnuture, Leather processing, Textile and Garment, Management consultancy. In addition there is plan to improve students attachments to clusters to include all other university faculties, including social sciences and media. Top program leaders in Uganda emphasize that virtually students from all faculties will find topic for dissertation/thesis by participating in cluster activities, and clusters will benefit from their involvement. E.g those from social science will do projects on things such as "trust" in clusters. This would also provide opportunity for researchers from different faculties at the same university to interact and learn from each other. Both Dr. Nawangwe and Dr. Ziraba acknowledge the fact that the ISCP project has made them interact with lectures from faculties which, as engineers, would never have interacted; and have learnt a lot in the process.

According Dr. Nawangwe and Dr. Ziraba, other efforts in the pipe line include: 1) strengthening the cluster leadership at the local level, and provide ICT facility and build capacity to communicate with the Cluster Secretariat in Kampala; 2) to improve the cluster website to include useful information for all the clusters. This will include, among others, different sources of finance, markets, including inputs, events, etc. Essentially every cluster will have a space of its own to report things; and 3) moving from clusters to national systems of innovation for some of the clusters, e.g. mushroom, by mobilizing sub-clusters in different regions of the country, and liking these up to make national systems of innovation.

It is also worth noting that ISCP-U seems to be very ambitious as far as cluster initiatives are concerned. In this regard, the Ugandan ISCP Progress Report, 2007 to 2010 states that one of the major objectives of ISCP-U is to establish 100 cluster initiatives by 2020 with 8 new clusters established per year. In relation to this in February 2009, about 70 new participants from the private sector, government and academia were trained in the area of cluster activities, and 8 more clusters were proposed for initiation.

[45] National Steering Committee, "Ugandan ISCP Progress Report, 2007 to 2010"

CLUSTER SPECIFIC LEVELS

The table below discusses only the clusters, which have been visited by the evaluation team:[46]

Features, activities[47] and outcomes	Challenges
Cluster 1 Luwero Fruits and Vegetable	
This cluster is made up of farmers of fruits and vegetables, mostly pineapples, dodo, ocra tomatoes and banana (F17 and F25). The cluster also includes processors, traders and transporters. The cluster has a total of four processing firms, located approximately 5–6 kilometers apart. Processed goods include, juice, wine and just dried fruits and vegetables. One of the largest processing firm (Sulma foods Ltd.) employees about 17 people and exports to Uk, US, Italy and Dubai. It seems they were able to break into the export market largely because their products are organic- no food additive. Fresh fruits are also exported, and attractive because of organic farming. There are about 175 farmers belonging to the cluster in total. According to the interviewed cluster members, the major benefits of ISCP-U are the expansion of the processing activities. The project trained other cluster members on the processing technology using equipments bought by the project. The existing business expanded and three more new entered. The training was conducted by the university lecturer (Department of food technology). - Other benefits are opportunity to network and learning from each other. - Farmers incomes have increased because of the enhanced processing activities. - The ICSP-Ug secretariat is assisting in common marketing, e.g. common branding. The University is planning to set up an incubation center close to the cluster.	- Efficient machines for processing - Quality improvement and packaging for most firms is still a major challenge.
Cluster 2 Leather Cluster	
Basically made up of manufactures of leather products such as shoes and bags, traders of finished leather materials, and only one tannery based in Jinja. There are several manufacturers of leather products located in Kampala, basically serving a small section of local market: army boots, school children and some men shoes; and women sandals.	- High taxes and high cost of production. For instance, sometimes it is much cheaper to buy finished leather material from Kenya rather than Uganda –

[46] Materials are derived from interviews during field visits, complemented by various progress reports.

[47] Most of the activities conducted are common to most clusters, which include: identification and training of facilitating teams, baseline surveys, refresher courses, identification of low hanging fruits, business training, awareness workshops and sourcing funding.

Features, activities and outcomes	Challenges
Outcome of involvement in ISCP-U include: - Networking and learning from each other. - Opportunities for exhibition. - Training on manufacture of leather goods, especially shoe making; so quality of the goods improved as a result of involvement in cluster. - Easy access to leather supplies. - Tannery training. - Waste water treatment.	to some extent jeopardizing the unity of a cluster. -Machines in use are very old. -Designs to break into the export market is still a major problem.
Cluster 3 Mushroom Cluster	
The cluster was initiated in 2007, and consist of the following business lines: mushroom farming (44 farmers), 2 spawn makers, 2 substrate suppliers and 2 companies adding value. Major products include: after shave, immunity boosters, mushroom beverages, porridge, and crunches. Outcome of the involvement in the cluster project include: -Enhanced sharing of information among by the then existing farmers, including a study tour to Tanzania where they learnt a lot; and therefore increased quality and productivity. Many more entered into the mushroom business, especially farming, and therefore mushroom growing has increased by 20% percent ever since. - Training on shitake spawn production and growing, and training in mushroom growing in general. - Opportunities for exhibition. - Joint supplies, especially if order is beyond the capability of individual entrepreneur.	-Quality control, standardization and certification is still a challenge, e.g. -Affordable houses for growing mushrooms. -Lack of affordable machinery. -Lack of common collection center, and decentralized spawn making centers. -Lack of funds generally.
Cluster 4 Katwe Metal Cluster	
The Cluster started its activities in 2006. It is estimated that there are about 800 firms employing over 3000 people in involved in activities such as: general fabrication, light machines, foundry, forging, furniture, motor vehicle parts, and industrial machinery. They make a large variety of products for mostly the local market. The outcome of the involvement of cluster in the initiative include the following: - The Metal Fabricators Cluster has been able to interact and benefit from other partners like Kyambogo University, Makerere University, Uganda Industrial Research Insitute, Nile Vocational Training Insitute, and as a result there has been producsts improvents in quality. - Job sharing when order is beyond the capability of individual firms.	-Lack of common premise where cluster members and meet and discuss their affairs. -They also wished to have some basic facilities such as toilets, etc. -Basic and important tools and equipments are missing, and very expensive.

Features, activities and outcomes	Challenges
Cluster 5 ICT Cluster	
Enhanced sharing of information and trust	
New software being developed for social groups	
Larger project handled	

CONCLUSIONS

This evaluation exercise has revealed that cluster project has taken roots in Uganda, with a good number of national organizations taking interest and collaborating with ISCP-U. This is very important for the sustainability of the project and also spill over to the broader national economy. The project has also encouraged the collaboration among different faculties of the Makerere University and collaboration between Makerere University and other universities such as the Kyambogo Univeristy. Government funding of the coordinating unit and the University of Makerere can be said to a positive outcome of the work and suggests the maximum level of sustainability of the work in Uganda among the ISCP countries.

At the cluster level, the most visible and most common benefit mentioned by nearly all interviewed clusters included – the benefits from enhanced networking and learning from each other among cluster firms and beyond them. Other benefits that were often mentioned include business training, job sharing and joint supply of orders in the event orders go beyond the capability of single entrepreneur or firm. In addition, improvement of quality and moving into higher value addition has been mentioned, but to a lesser extent.

The major question on the impacts on research in particular – apart from the university leading in cluster initiatives – is not evident at this point in time. The current student attachment program, is rated positively by students and cluster members, and could in the future bring to the fore, some of the cluster problems for researchers and even solve them. The fact that most of the clusters are in low tech sectors, the most likely contribution of the university will be in terms of supporting and transferring "incremental innovations" and providing the evidenced base for cluster policies that will be contributed by the Business Schools and Faculties of Social Sciences. However the major challenge that seems to be facing most clusters is capital. Most clusters can not purchase necessary equipments for production.

RECOMMENDATIONS

- Economic benefits from clustering are long term. The fact that some short term benefits are already emerging should be taken as a capital for persistence and perseverance, but moving in a right direction; this is only possible through continuous monitoring and evaluation. In this case what is immediately needed is the identification of monitoring and evaluation indictors. Efforts in Uganda is commendable in this regard: according to our interviews with the cluster secretariat, the program has assigned two consultants to carry out a situation analysis and business diagnostic studies of the whole program which will result into, among others, identification of indicators for monitoring and evaluation.
- Initiation of high tech clusters that will largely benefit from commercialization of university research. This is difficult, but careful selection of sectors, supported by government procurement, should be able to lead into something
- Clusters should be advised to join forces in purchase of expensive equipment.

SURVEY

The electronic survey was sent to the subset of thirty-five people, but only thirteen persons answered the questionnaire. Five of them come from universities, one comes from a research institute, two come from NGOs and five come from business associations. As none of the respondents are from government entities or firms these sections have not been considered. The respondent from research institute only answered about his participation in the project, for this reason this response has not been considered elsewhere. Of all the respondents ten persons completed most of the answers. The numbers are too small to provide confidence in the quantitative values but the responses provide additional support to the qualitative findings from the field interviews.

PARTICIPATION

Four of the five respondents from universities completed most of the questions. They reported having worked with ISCP-Uganda in the following ways: as Chairman of National Steering Committee; working at the ISCP/PACF-Uganda office which over sees, provides linkages for Clusters; and coordinates activities of all its 22 cluster initiatives etc; “I am a facilitator; work with ISCP-U as

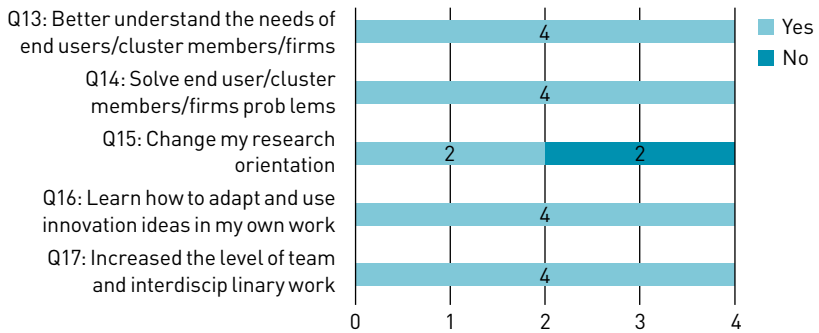
a field officer". Four of them reported having participated as cluster facilitators, in workshops and training to increase their capacity; providing training to others to transfer knowledge, and working on creating networks, links and alliances within the University. Also, three of them have worked on creating networks, links and alliances with other Universities and Research Organizations. Two of them have participated as project management and providing services to production firms. (See Figure 4.1 / Table 4.4)

Table 4.1: Respondents to the survey on the Sida Strategic Evaluation of Innovation Systems – ISCP UGANDA

		#	%
# people that received the survey		35	100.0
Total respondents		13	37.1
Gender	Female	3	23.1
	Male	10	76.9
Age	Below 35	3	23.1
	36–45	1	7.7
	46–55	4	30.8
	Older than 56	5	38.5
Level of education	Primary	0	0.0
	High School	0	0.0
	Diploma	2	15.4
	Bachelors	5	38.5
	Masters	3	23.1
	PhD	3	23.1
Discipline	Natural Science	2	15.4
	Engineering	3	23.1
	Medicine or other medical or health specialization	0	0.0
	Social Sciences	2	15.4
	Public administration	0	0.0
	Education	1	7.7
	Business and Commerce	4	30.8
	Other	0	0.0
	No information	0	0.0

		#	%
Kind of organization	University	5	38.5
	Research Institute	1	7.7
	Government Organization	0	0.0
	Firm	0	0.0
	Financial Institution	0	0.0
	NGO	2	15.4
	Workers Union	0	0.0
	Business Association	5	38.5
	Other	0	0.0

Figure 4.1: My involvement helped to increase my own capacity to:



The person from the research institute participated in the project in all the roles except as a project manager. The people that are from other organizations (two from NGOs and five from business association), six of them reported having worked with ISCP-Uganda – as a cluster facilitator for the Leather Processing Cluster-Jinja and the Super Goat Cluster – Wakiso'; member of the National Steering Committee and member of the Lake Katwe Salt Cluster; cluster facilitator – the Maize Millers Cluster; trained as a cluster facilitator and have since been benefiting from the training sessions organized for the various clusters; in the secretariat; in the clusters Program.

On their roles; all five worked on creating networks, links and alliances between stakeholders; four provided training to others, participated in workshops and training to increase their capacity to transfer knowledge; and only two have provided services to production firms.

IMPACT – UNIVERSITY

The university respondents confirmed that participation helped them to better understand the needs and solve problems of end users,

cluster members and firms; they understood what "kind of knowledge [is] needed per cluster initiative"; can "diagnose the problems that cluster initiative brings" and "they carry out needs assessment for cluster members". They also learned how to solve end user/cluster members/firms problems "trough trainings for their needs" and "with linkages to researchers" and how to adapt and use innovation ideas in their own work "providing skills training", "synergizing with others to be competitive", "being creative and sharing with their colleagues new ideas" and "understanding networks and using relevant examples". They also increased the level of team and interdisciplinary work: "I have able to team with researchers from technology to help metal fabrication cluster design a poor man's car" and "I have learn to work in a team, motivate others, respect one another, and build trust and self confidence and above all being accountable in all emerging situations". Only two of the respondents said the project have changed their research orientation, one of them said to have passed "from the biofuel industry to machine tools".
(See Table 4.2)

Table 4.2: Q13–17. My involvement helped to increase my own capacity to:

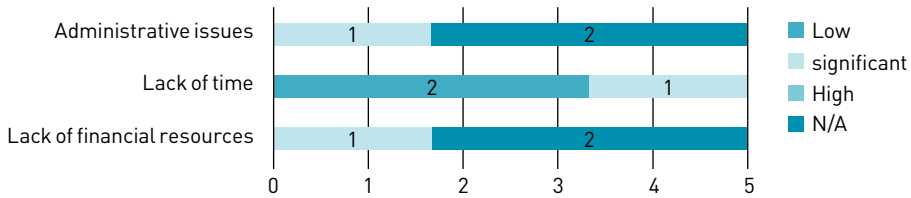
Question	Responses		
	Yes	No	Total
Q13: Better understand the needs of end users/cluster members/firms	4	0	4
Q14: Solve end user/cluster members/firms problems	4	0	4
Q15: Change my research orientation	2	2	4
Q16: Learn how to adapt and use innovation ideas in my own work	4	0	4
Q17: Increased the level of team and interdisciplinary work	4	0	4

Question	If yes, explain (answers below as provided by respondents)
Q13. Better understand the needs of end users/cluster members/ firms	I now know the kind knowledge needed per cluster initiative and better to transfer it there. It was through my personal interactivity with Cluster members that we were able to diagnose the problems of Cluster initiatives. Was able to carry out needs assessment for cluster members.

Question	If yes, explain (answers below as provided by respondents)
Q14. Solve end user/cluster members/ firms problems	A solution is being worked out through training of Clusters in Better Business Practices, providing linkages and Resource mobilization. Provided them with trainings and linkages to researchers. They have cleaner production, they produce purer products. This is through training from their needs.
Q15. Change my research orientation	Demand driven or problem based. Today I research in biofuels yet I am trained in Machine tools.
Q16. Learn how to adapt and use innovation ideas in my own work	Now as a field officer I can also provide business skills training, help cluster firms with business writing. One has to synergize with others in order to be competitive. This is because I have now really learnt that working alone as an individual is really hard to progress in a business setting. Therefore, in some situations I have always been creative & thought outside the box and come up with new ideas which I have always shared with my colleagues. Understanding networks and using relevant examples.
Q17. Increased the level of team and interdisciplinary work	As a social scientist I have able to team with researchers from technology to help metal fabrication cluster design a poor man's car. I have learnt to work in a team, motivate others, respect one another, and build trust and self confidence and above all being accountable in all emerging situations. I work with people from Agriculture and salespeople yet I am a biofuel guy. Yes through workshops to understand benefits.

For some respondents the financial resources were, in different degrees, an impediment to achieve better their project goals, while for one of them financial resources were appropriate and he said "more funds were committed to this project to conduct more trainings and visits to leading clusters based countries in the world". Additionally, one respondent replied that the time was enough to achieve his goals: "if more finances were available on time". Besides, although the respondents indicated that administrative issues were not a barrier to their performance, one of them said that his role could have been more effective without "institutional bureaucracy". (See figure 4.2)

Figure 4.2: Q19. The greatest difficulty you faced in making contributions were due to:



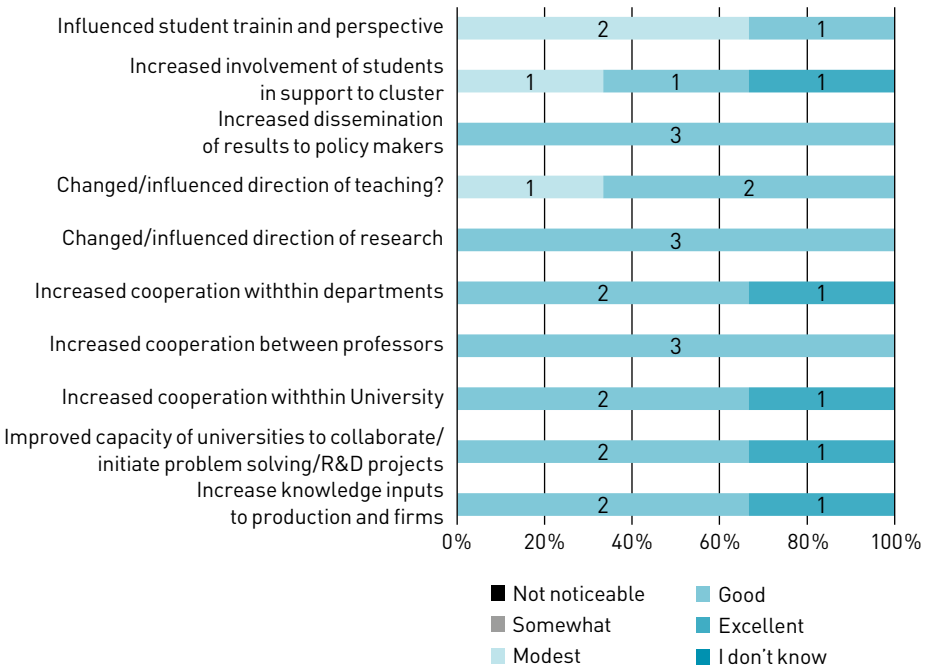
Based on their experiences, the respondents think that the project has helped, in a good and in some cases in an excellent way, to increase knowledge inputs to production and firms, improve capacity of universities to collaborate/initiate problem solving/R&D projects, change directions of the research, increase cooperation within University between professors and within departments, and increase dissemination of results to policy makers. In a moderate way (modest or good) the project has helped to change/influence direction of teaching. Besides, there was not a consensus if the project has helped to increase involvement of students in support to cluster. (See Table 4.3 and figure 4.3)

Table 4.3: Q20. Based on your own experience, do you think, the project has helped to:

	Not noticeable	Somewhat	Modest	Good	Excellent	I don't know	No response
Increase knowledge inputs to production and firms	0	0	0	2	1	0	2
Improved capacity of universities to collaborate/ initiate problem solving/R&D projects	0	0	0	2	1	0	2
Increased cooperation within University	0	0	0	2	1	0	2
Increased cooperation between professors	0	0	0	3	0	0	2
Increased cooperation within departments	0	0	0	2	1	0	2
Changed/influenced direction of research	0	0	0	3	0	0	2
Changed/influenced direction of teaching?	0	0	1	2	0	0	2

	Not noticeable	Somewhat	Modest	Good	Excellent	I don't know	No response
Increased dissemination of results to policy makers	0	0	0	3	0	0	2
Increased involvement of students in support to cluster	0	0	1	1	1	0	2
Influenced student training and perspective	0	0	2	1	0	0	2

Figure 4.3: Q20: Based on your own experience, do you think, the project has helped to:



For the respondents the organization of the project could be improved to increase the benefits - "through the National Council for higher education masters programs in line with innovative systems & innovative clusters", "increasing cluster and encouraging deliberate inclusion of cluster related studies in the university system" and trough "visitation of the two parties to each other in their premises". Some of the achievements reached are: "internships, curriculum designed by business school specifically for the cluster members", "other stakeholders have been brought on board such as SNV, UNIDO, CICS, among others, mobilization some funds such as the presidential innovation award, trust building hence members" and

"design of distillation column, poor man's car, adaptation by government of Uganda the cluster in its national policy, increased SME's performance, increased visibility of the University to the business community".

RESPONSE FROM OTHER STAKEHOLDER ORGANIZATIONS

There were two respondents from NGOs and five from business association. Five of them have worked on creating networks, links and alliances; four participated in workshops and training to increase their capacity; and only two provided services to production firms. They confirmed gains as: "knowledge, skills and capacity to conduct participatory result oriented programs, built network with a number of useful resource persons from other clusters, new ideas, experience in solving business cross-cutting problems, sharing of skills and knowledge from the international resource persons, and relationship with high institutions of learning, researchers and politicians", "funds to facilitate programs", "network with other clusters that have linked us to manufacturers of machinery and equipment for refining salt, training for running a cluster strengthened and increased quality salt from the lake" and "training and facilitation".

They said, they learned "the art of working with others", "the concept of clusters and how they can improve on production and quality", that "there is a need to integrate the whole supply value chain", and build "better business networks". The project was useful for their organization because "the link to a range of stakeholders created a lot of awareness towards business related problems and challenges, it allows one to think aloud/outside the box in order to achieve the targeted demand driven goals and programs/activities to be implemented emanated from the stakeholders not a matter of imposing something to them". It also "made adjust the way of thinking in a positive one of handling competition, increase productivity and quality of products", "help the organization to easily transfer the technology to end users and increase the volume of business", "improve sales and better budgeting", and "create linkages and improve on marketing of products".

They said it could work better by having:

Some quick response to research related requests especially in technical areas- food, tools, and machinery; Attachment of research fellows, develop research projects in regard to identified issues; improved relationship with the stakeholders by working hand in hand with the artisans in their workshops; constant monitoring of

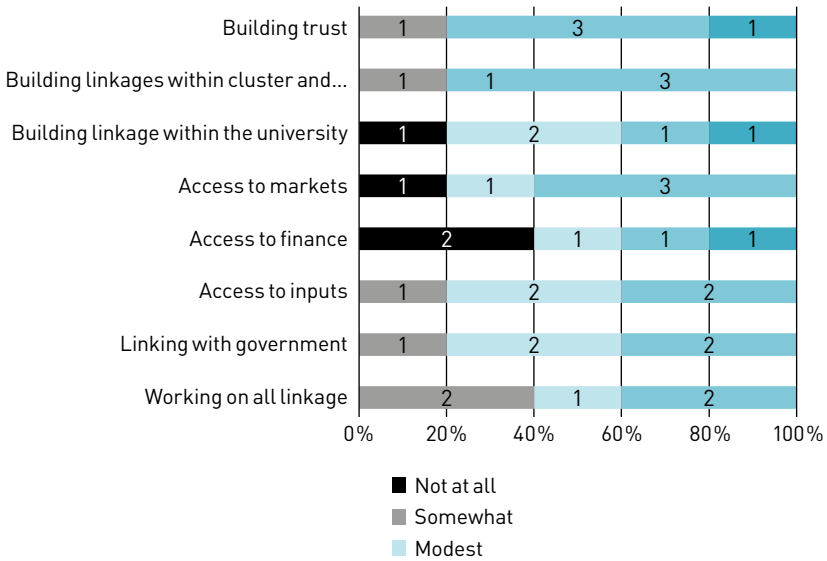
cluster activities by the ISCP Secretariat team and quick response to the cluster stakeholders on what the team feels about the ongoing cluster activities in view of the ISCP general objectives; constant quarterly reports on the performance of the clusters; awards- marks and trophies; share experiences with other projects elsewhere in the world as regards to successes and the contributing factors as well as challenges and how they were handled; more training and research; more benchmarking; a leading role to the private sector.

FACILITATOR EXPERIENCES

Six respondents said they participated as facilitators, at: Lake Katwe Salt Cluster – Kasese District Western Uganda; Maize Millers Cluster; Seeds Cluster; Textile and Garment Cluster; and Tree Growers Cluster. They confirmed that they received training as facilitators and it was very relevant and critical to their facilitation role in most of the cases: "I was able to understand the importance and usefulness of clustering", "it was well tailored to my roles", "the training took me through the clustering process and importance of a triple helix", "the knowledge and skills acquired where an additional capacity building to me as a human resource in handling business related issues, hence developed a new participatory approach to issues which was not the case before", "developing demand driven programs makes work interesting and hence easy to evaluate achievements or failures within a specified period in regard to a achieving common cluster goals, objectives and vision", and "I understood my role clearly and how to operate as a facilitator and what to do". All agreed that they needed to be repeated more often and followed up on the training of facilitators in the future. They pointed out that the topics that needed more attention are: "clustering as means of strengthening value chains", "clustering process resource mobilization for cluster sustainability", "courses focus on sharing experiences", "strategies towards achieving /attaining the hanging fruit level", and "networking".

As a facilitators, five said that they could use their capacity "well or very well" to build trust and linkage within cluster and across clusters. For most of them it was well or very well to build linkage with the university, access to markets and inputs, and working on all linkage. On the other hand, it did not help to access to finance and linking with government. (See figure 4.4)

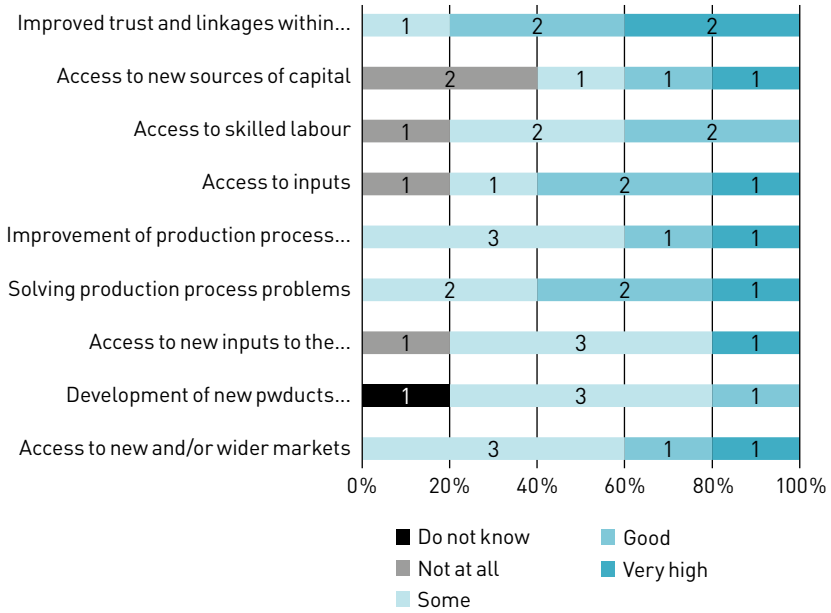
Figure 4.4: Asses how your capacity was utilized:



The respondents said that: "trust is formed gradually, while people were becoming members", "most of the members consult me many times on issues concerning their own businesses and cluster", "my experience as chairman of Uganda small scale industries association brought in many entrepreneurs in the cluster promotion", "it was not easy to convince the stakeholders but finally built hope and confidence in them basing on the objectives of the cluster initiatives". About building linkages within cluster and across clusters they said that: "the clusters started linking up to receive services from other clusters", "I was able to use my networks to meet relevant organizations", "We started with only ten members now we have about 45", and "We were able to link up with other clusters stakeholders and involved them in training and advisory services".

The facilitators think that the cluster improved trust and linkages within it and externality in a good and very high way. The performance in the access to new and/or wider markets, solving production process problems and improvement of production processes/services delivery was just moderate (some or good). But there were no agreement on improvements in development of new products/services, in access to new inputs to the production and/ or process, or components, in access to inputs, skilled labour and new sources of capital. (See figure 4.5)

Figure 4.5: Views on the impact of the cluster program on the SPECIFIC cluster(s) you facilitated



	Do not know	Not at all	Some	Good	Very high	Total
Q92: Access to new and/ or wider markets	0	0	3	1	1	5
Q93: Development of new products / services	1	0	3	1	0	5
Q94: Access to new inputs to the production and/ or process, or components	0	1	3	0	1	5
Q95: Solving production process problems	0	0	2	2	1	5
Q96: Improvement of production process/ service delivery	0	0	3	1	1	5
Q97: Access to inputs	0	1	1	2	1	5
Q98: Access to skilled labour	0	1	2	2	0	5
Q99: Access to new sources of capital	0	2	1	1	1	5
Q100: Improved trust and linkages within the cluster and externally	0	0	1	2	2	5

Question	Please, explain (answers below are as provided by respondents)
Q92	Have got connections to export organizations and local organizations. New markets have opened up. Some of the entrepreneurs identified their mistakes and improved on products and cooperation hence new markets in Kampala.
Q93	Introduced and demonstrated a post harvest technology (Maize sheller) to simplify the use of sticks to hit maize grains from the maize cob. Sharing experience and training. We are trying to develop animal feeds.
Q94	Linked part of the cluster stakeholders – farmers, the millers and others not yet -still on own initiatives.
Q95	Millers got training on mill maintenance hence reducing a number of common faults in the milling process. Sharing experiences. We are just beginning.
Q96	After the mill maintenance course millers change the production methods but the service delivery needs further study. Sharing of ideas and training. Slowly.
Q97	Collectively buying fabric from Nytil.
Q98	Members are skilled. Not much has been done. This is still a problem as most people are trained on job at times with low education levels, supply in labor market is not demand driven.
Q99	Linked to microfinance. None of the financing institutions has a favorable package and conditions for the entrepreneurs yet we have not yet identified one- the SACCOs are still infant with minute reserves to sustain the members.
Q100	Attendance of trade exhibitions and working together to fulfill orders. Linkage yes but trust takes time. Moving forward.

OTHER EXPERIENCES

From the people that completed the survey, four people were aware of other experiences that work to increase linkage and networks between universities, researches institutes, government and firms or other. Six of them are aware of other programs that work with clusters and are involved with another cluster linkage.

Question	If yes, please explain (answers below as provided by respondents):
Q101	UNIDO working with Basketry Cluster on product development, SNV working with Pineapple Cluster to increase productivity of high quality pineapples, PSF-Uganda sponsors clusters through cost sharing grants, CREEC working with Bio-fuel Cluster, CICS Government wing for Competitiveness & Investment Climate also tries to bring other stakeholders together through organizing national cluster Foras, and Uganda investment authority through its training for entrepreneurial development. Crafts, fishing, ICT. SNV, CICS, UIRI, MTTI, OVCOP, UNIDO and WWF. The World Bank promotes innovations. These some organizations that export and private sector foundation. Uganda Investment Authority (UIA).
Q102	CREEC working with many stakeholders such as universities, government, users research institutions to provide mechanism for technology transfer, pilot project implementation, training and conducting public awareness to mention but a few. The ATPS which is a multi-disciplinary network of researchers, practitioners and policy makers that promotes science, technology and innovation (STI) policy research, dialogue and practice, for African development. DFID, SNV, CICS, UIRI. Millennium science initiative through the national council of science and technology. NAADS can if it is properly re-organized, FIT -Uganda for price information, and PSFU- as an umbrella organization, UIRI- NARO- UNIDO-UMA-NUMA.
Q103	OVOP by Ministry of Trade for one village one product, UNIDO sponsoring product development in basketry Cluster and Bamboo Cluster Initiative, NAADS mainly for agriculture and working closely with farmers, textile development agency which provides training and business mentorship in textile & fashion. Imparting business management skills through UIA for local investment promotion/support. Kyambogo University in the designing of the boiler and distillation column for the mushroom and bio fuel clusters respectively. Research work with Mbarara University of science and technology.

REFERENCES

Lindroos, M. (2007), "Continued Support to the Pilot Phase of the Innovation Systems and Clusters Program (ISCP) in Uganda", Sida memo of November 16th

National Steering Committee, "Ugandan ISCP Progress Report, 2007 to 2010"

Progress Report for Katwe Metal Cluster, July 2008to July 2009

Progress report for Mushroom Cluster, 2006 to July 2009

Progress report for Fruits and vegetable Cluster, May 2008 – July 2009

Progress Report for leather Processing Cluster, August 2008 – July 2009

VINNOVA and CLUSTERNAVIGATORS, "Feedback on Ugandan Cluster Initiatives Action Plans 2007"

LIST OF INTERVIEWEES – UGANDA

	Name	Organization	Role in the cluster
1	Lucy A.M Mugisha	Private Sector Foundation Uganda	Business support/ facilitator Mushroom cluster
2	John Nuwamanya	Private Sector Foundation Uganda	Business support/ facilitator Dairy cluster
3	Hon. Ruth Tuma	Parliament	Facilitator Jinja Maize Millers' cluster
4	Mwebe Emmanuel	Uganda Leather Association	Facilitator Jinja leather processing cluster
5	Kulumba Samuel	Makerere University Faculty of Vet Medicine	Facilitator Jinja leather processing cluster
6	Tugume Alexis	Makerere University Faculty of Vet Medicine	Facilitator Jinja leather processing cluster
7	Tugume Alexis	Seeds cluster	Entrepreneur Cluster
8	Kigozi	Entrepreneur	Processor
9	Audrey Kahara Kawuki	Makerere University Business School	Director/ facilitator Textile cluster
10	Kigozi	Entrepreneur	Processor
11	Kizindo Salim	Entrepreneur	Chairman farmers
12	Mabonga Isaac	Tropical Beverages Uganda ltd	Processor
13	Mabonga Justine	Tropical Beverages Uganda ltd	Production Manager

	Name	Organization	Role in the cluster
14	Kibwami Edward	Government	Vice Chairman
15	Edith Wamara	Entrepreneur	Processor/facilitator
16	Gafuma Samuel	Kyambgo University	Facilitator
17	Name	Organization	Role in the cluster
18	Harriet Nansukusa	UNIDO	Secretary/facilitator/ farmer
19	Betty Kiwana	Betna	Chairperson
20	Lucy A.M Mugisha	Privte Sector Founda-tion Uganda	Treasurer
21	Bwanika A Innocent	Albert Baker Fund	Trainer
22	Mr and Mrs Bazanye	Entrepreneurs	Farmers
23	Dr.Barnabas Nawangwe	Faculty of Engineering, Makerere	Coorddinator of the ISCP-Ug
24	Dr. Yasin naku Ziraba	Faculty of Engineering, Makerere	Chairman of the National Steering Committee
25	Ms Grace Twinamatsiko	ISCP-Ug Secretariat	Coordination of ISCP-Ug activities
26	Denis Okumu	ISCP-Ug Secretariat	Coordination of ISCP-Ug activities
27	Geoffrey Were	ISCP-Ug Secretariat	Coordination of ISCP-Ug activities

5 ISCP – Mozambique

BACKGROUND[48]

The Mozambique participants were introduced to the ideas of the innovation systems and clusters at the same time as participants in Tanzania and Uganda. The process started when ten delegates from Mozambique participated in "The Competitiveness Institute" 6th Annual Conference on Innovative Clusters in 2003. But the initiative took longer to get moving in Mozambique compared to Tanzania and Uganda and its early development history remains somewhat unclear.

Sida supported ISCP-MZ for the period 2006–2009, with a contribution of SEK 2,250,000, according to the Assessment Memo. The activities are centered at the Faculty of Engineering at the Eduardo Mondlane University (UEM) and eight cluster pilot initiatives were identified in 2006.[49]

FINDINGS

The ISCP-Mozambique programme began with the setting up of a National Steering Committee and a one-week facilitators' training workshop held in June/July 2006,[50] supported by VINNOVA. The participants were selected based on their engagement in relevant R&D projects, government agencies or entrepreneurial activities. The workshop brainstormed ideas for possible CI, with more than 20 ideas elaborated. In the next step eleven CI were outlined. Final-

[48] This report was prepared by Amitav Rath and Bitrina Diyamett. It is based on documents reviewed that have been listed, a field visit and interviews by Bitrina Diyamett in December 2010 focused on the first 8 CI, and the response by one person to the electronic survey. Given the low response to the survey the survey response has been integrated into the text and not provided separately as for other countries.

[49] The UEM Final report states – the programme, initiated in 2005 was planned to be implemented in three phases, namely; Initiation of the Programme and Piloting, Full Scale Operationalization and Implementation, and Programme Consolidation. During the first phase of the programme that covered a period of four years from 2005 to 2009, a total of SEK 2.25 million was advanced by Sida to the programme in Mozambique.

[50] Annual Report, 2008 and Sida Prememoria, 2007.

ly, they were reduced to eight and approved CIs were recommended to send an application to the NSC. There were finally eight CI proposals, and the Steering Committee and the International Team[51] approved these in December 2006, as listed below in Table 5.1 (first 8 clusters).

Table 5.1: Names of clusters and facilitators, locations and distance from Maputo

No.	Cluster	Where	Start	Facilitator	Co-Facilitator
1	Small scale mining	Manica, 1200 km	2006	Antonio Cumbane	Marcelina Xai-Xai
2	Fruit processing	Maputo	2006	Maida Khan	Paulo Negrao
3	Wood furniture	Maputo	2006	Rui Vasco Sitoe	Yolanda Fernades
4	Waste management	Maputo	2006	Vasco Junior	Arnaldo Tembe
5	Cassava processing	Inharrime, 400 km	2006	Geraldo Nhumaio	Bruno Araujo
6	Beef processing	Magude, 150 km	2006	Francisco Mausse	Belmira Mata
7	Medicinal plants	Macia, 150 km	2006	Adelaide Bela Agostinho	Paulina
8	Cashew nuts processing	Nampula, 200 km	2006	Vasco Junior	Else Marie Fogtman
9	Fish processing	Vilankulo, 700 km	2009	Madina Mamade	Moises Rogerio
10	Medicinal plants	Vilankulo	2009	Simiao Balane	Isidro Muhate
11	Rural Eco-tourism	Vilankulo	2009	Nercia Ebal	Ildo Massitela
12	Fruit processing	Morrumbene, 550 km	2009	Manuel Cumbe	Laurenciana Manuel
13	Waste management	Inhambane, 500 km	2009	Helzio Azevedo	Abel Zico
14	Low cost building materials	Inhambane	2009	Zacarias Zarco	Nelsa Guiraguira
15	Heritage tourism	Inhambane	2009	Jose da Cunha	Alberto Mathe

[51] The International Team was initially contracted through VINNOVA and subsequently Sida entered into an agreement with SICD.

No.	Cluster	Where	Start	Facilitator	Co-Facilitator
16	Peri-Peri processing	Inharrime, 400km	2009	Geraldo Nhumaio	Afonso Sambo
17	Coconut and by-products	Massinga, 600 km	2009	Miguel Conceição	Idalina Armando
18	Honey farming	Homoine, 550 km	2009	Fernando Nhaliginga	Jaime Chambela
19	Fashion cluster	Inhambane	2009	Inocêncio Rafael	Iva Carmen
20	Organic fertilizer	Vilankulo	2009	Freydson Rafael	Rute Israel
21	Chicken farming	Vilankulo	2009	Carmen Stella	Paula Mangoba
22	Chicken farming	Inhambane, 500 km	2009	Augusto Massalonga	Álvaro Guimarães
23	Wood furniture	Vilankulo	2009	Edgar José Faria	

After the workshop of June 2006, and the selection of clusters, the process of "implementation in Mozambique" hibernated due to "difficulties of sending application proposal for funding" to Sida/SAREC.[52]

A new application sent in September 2007 was approved by Sida and activities restarted. The Sida PROMEMORIA, dated 18 September 2007, noted that given the delay of one year, a "refresher course / workshop" would be provided by the Swedish team. Other positive features noted were the "strong representation from several ministries and academia" in the National Steering Committee[53].

The Sida agreement (dated September 24, 2007, with UEM)[54] states that SEK one million five hundred thousand were allocated

[52] Annual Report of UEM to Sida, for January – December 2008, Date of submission: 23 March 2009, p.2.

[53] The National Steering Committee included 3 persons from the faculty of Engineering, UEM; and representatives of the Ministry of Industry and Trade; Ministry of Science and Technology; Ministry of Agriculture; as well as one person representing civil society. The facilitators included persons from various faculties – Science, Engineering, Veterinary and Traditional medicine, and that was positive. A notable absence given the focus of the work is the lack of involvement by anyone in economics, business and other social sciences, as well as the lack of participation from other business support services in the country.

[54] Signed by the Rector, subsequent to a proposal from Prof. Antonio Jose Cumbane, Faculty of Engineering, UEM, Coordinator of the Innovation

for the remaining period to December 2008. The contribution to UEM was for a little over one million SEK (though only 90 % was made available for activities before the end of the agreement period) and 420,000 SEK was allocated to VINNOVA for project support. The allocations were similar to the other ISCP grants in Tanzania and Uganda with the first payment of SEK 35,000 (around USD 5,000) made to each cluster, followed by a second payment of the same amount, to allow each CI to implement activities within their individual budget envelope.

Table 5.2: Allocations made in September 2007

Item	Budget
Initial: 8CI X 35,000 SEK	280,000 SEK (18.7%)
Second payment: 8X35	280,000 SEK (18.7%)
Incentive support for promising CI	220,000 SEK (14.7%)
UEM costs	300,000 SEK (20%)
VINNOVA – Fees, international travel	420,000 SEK (28%)
Total	**1,500,000 SEK (100%)**

The work resumed in September 2007, and the NSC met with Facilitators and encouraged them to implement activities as per proposals sent in 2006. The International Team came to Mozambique in November 17–24. An evaluation seminar was organized (in August 2008, presumably to plan the resumption of activities) to review achievements and discuss the ways forward focused on key challenges facing each cluster initiative; and the responses and priority activities for the cluster. In general, common priorities included the need to undertake "Situation analysis" of facts, statistics, reports, baseline surveys on who the cluster members are, the business issues, the value chain, determining priorities and how they can be met. When work resumed, it was reported that some clusters had managed to remain active during the pause, despite the problems with funding, specially those which had been linked to the bilateral research programme funded by Sida/SAREC at UEM – Cassava and Wood (numbers five and three respectively). The waste management cluster (number 4) had also been active without any financial support, since facilitators and stakeholders could meet easily.

Systems and Innovative Clusters Programme in Mozambique, dated 18 September 2007 for eight clusters.

The Final project report states that by early 2009 there were 23 clusters, with 15 new ones started in 2008. A total of 44 cluster facilitators had been trained by the external team and were involved in the Mozambique clusters. Table 3 lists the summaries of issues for the eight clusters done in the 2008 annual narrative report.

Table 5.3: Summary of Clusters in Mozambique

	Cluster	Features, activities and outcomes
1	Cashew nuts	Nampula is the main production centre for cashew. There is one local facilitator from the National Institute of Cashew and two others from Maputo, leading to high travel costs. About 30 stakeholder members of cashew farmers association, small-scale cashew processors and local authorities have been engaged in this cluster.
2	Small scale mining	The facilitating team undertook mobilization of the small-scale mines associations of Bandire and Munhena and worked with one medium enterprise exploiting ore deposits in Manica. Noted that the next step was for a market study and feasibility to install a processing unit; and saw a great potential on developing a cluster with water treatment authorities.
3	Cassava	Met with and had support of local authorities; also met with the existing cassava farmers associations. Led to commitment of local authorities and farmers associations to the clustering activities. A focal point selected was the Director for Economic Activities. Work began in training the farmers on appropriate technologies of cassava processing, especially for the production of flour for making cassava bread. Interviews with Cassava Cluster Facilitators suggest that there are about 90 individual cassava farmers (from 3 associations) and one processing plant for cassava processing who are active in the cluster. The main product is "rhale", equivalent to "gari" for West Africa. Cassava chips have to be transported 500 km to Maputo for milling, and so there is a need to develop local capacity for small scale milling and packaging of flour within the cluster, which the UEM plans to help with. The outcomes of the initiative were stated as: Sharing of experience among cluster members. Opportunity to link with the university and R&D organizations – to learn about new cassava varieties that are good for processing, as not all are. Upgrade processing technology as the traditional processing method is tedious, time consuming, and also not hygienic. The cluster demonstrated modern processing technology – but has not moved to the large-scale adoption of the process in the cluster. Efforts at UEM towards the development of chipping, milling, roasting equipment for cassava, with one chipping machine made at UEM and tested by the Department of Chemical Engineering. Links made with the local government – the District Commissioner supported facilities for the meetings. The Mozambican bureau of standards helped train in standards.

	Cluster	Features, activities and outcomes
		The challenges include: Take off was delayed. The project began almost 2 years after the facilitators submitted the proposal to the University. Even after it restarted very little was done after a few, initial activities. Facilitators said it has again been over a year since the last contact with the cluster took place. The distance to the clusters is a problem and there have been no funds for long distance travel.
4	Intensive beef farming	The facilitating team is lead by one person from the Ministry of Science and Technology and another from the Agriculture Research Institute. The team raised awareness on cluster development with local authorities (Administrator and Directors for Economic activities) and cattle farmers association, and about 50 farmers were mobilised to participate and develop the cluster. Organised a team to provide cattle vaccination for about 50,000 cattle. Next priorities were to build water reservoirs for animals for the dry season, preparation of mineral blocks for animal feeding and upgrade the local abattoir.
5	Traditional medicine	Facilitating team travelled and mobilised stakeholders – medicinal plant farmers association, local authorities, Ministries of Agriculture, Health, Science and Technology and local NGO and conducted awareness raising workshop. The outcome was the commitment of all stakeholders to engage in cluster activities. Identified land where there will be pilot plantation of medicinal plants (a key step), and also use it as a nursery for distribution of new species to cluster members.
6	Wood furniture	The Chair of the association of wood furniture is a co-facilitator. Several meetings held to create awareness on the cluster initiative. Involved the Ministry of Industry and Trade, and, also the Bureau of Standards. Priority is for training on quality assurance to improve competition. Interviews with Wood Cluster Facilitators and visit to the Cluster and discussions with one entrepreneur suggest: This cluster, involves 30 cluster members all along the wood value chain from those who go to the forest cut and collect wood, traders and those who make furniture and other wood products such as doors, window frames and roofs, though the cluster consists largely of producers and traders of wood products. The cluster initiative resulted in: Collaboration and learning from each other. Clustering has helped in job sharing in cases where a cluster member gets an order beyond his/her capacity. Joint tendering to supply larger orders beyond individual capacity.

	Cluster	Features, activities and outcomes
		Links between engineering and faculty of agriculture that are doing research on wood properties. Exhibition to promote sales. Challenges: The major challenge is lack of funding, with no resources available beyond those for holding meetings. For example, they wanted to develop a business incubator, but there was no money for this. The facilitator applied for project funds to hire equipment and venue to train cluster members on quality, especially finishing of products, but this was not provided and there was no response. The momentum could not be sustained because of lack of funding. It has been over one year since the last cluster meeting.
7	Waste management	Worked to organise scavengers operating on a dumpsite in Matola; stakeholders included the Matola Municipal Council and industries located in Matola and Machava. Here the installation of a demonstration pilot plant for briquettes based on biomass waste was considered.
8	Fruit processing	This was considered the most promising cluster where the main stakeholders were an association of fruit farmers and included researchers from the agriculture research institute and the Centre for Agriculture Promotion and the Export Promotion Institute. The University was transferring technology developed by the facilitator on combined fruit drying techniques and added value for indigenous species of fruit. The cluster organised training activities with farmer association. Based on interviews with fruits and vegetable Cluster Facilitators, the benefits have been seen to be their visits to the communities where they learn about native fruits and vegetables, including current processing; and the facilitators then advise the farmers on better methods after carrying out laboratory tests. University staff has been able to propagate the knowledge from one community to another. An example is the native tree (Macuacua) that is processed to produce flour, and used in times of food scarcity by some communities. This was tested in the laboratory and found to be rich in fats, and other nutrients. The nutritional value of this plant was propagated to other communities and the university introduced better methods of processing. The facilitator stated that this was an ideal interaction between traditional and modern knowledge and local resource use. Challenges: But the major problem according to her has been funding. It has been over a year since she visited the cluster and said "I feel bad to visit the cluster, because I do not know what to tell them – I do not have means to implement the plan discussed with the cluster members over a year ago".

CONCLUSIONS

For various reasons the work in Mozambique suffered from many problems from the start. Even though teams from three countries participated in the seminal event in 2003 that led to the ISCP proposals the start in Mozambique was delayed. It has been stated that unlike Tanzania and Uganda, there was little commitment from the University and the Faculty of Engineering. Either because of a shortage of interested people or a lack of institutional commitment, after the formal start, there were changes in the coordinators in Mozambique, and one coordinator left for PhD studies.[55] The current coordinator was appointed only in 2007, initially on a temporary basis. The coordinator's role within the local context was sufficiently frustrating that he offered formally to withdraw, at a meeting with the International support team and colleagues from Uganda and Tanzania in August 2007, but he was requested to stay on.

In Uganda and Tanzania, on the other hand, the project coordinators were the Deans/ Principals of Colleges, who had greater authority and resources to allow for smoother project implementation. The renewal of activities after a gap of 18 months created fresh enthusiasm, but that was not enough to overcome the challenges, including possible conflicts with teaching schedules, which have remained unacknowledged in any documents that we have seen.

The hypothesis that there was insufficient ownership of the project within the important organizations is reflected also in the interviews conducted, the fact that only one person from a productive enterprise could be interviewed, and that there was only one person who completed the survey.[56]

With the stop and go nature of the activities, coordination issues and other difficulties, there were very few national awareness campaigns in Mozambique, on the program, or for the benefit of cluster initiatives, as in Uganda and Tanzania. Another consequence was that the project was not well advertised nationally – the government knew very little about it.

It can be stated with certainty that the initial selection of the clusters located at distances of 200, 500 and 2000 km from Maputo was

[55] The report of Trojer, 2007, states "There has been a discontinuity in the programme management". The programme moved through 3 hands in just 18 months. The final programme manager, Mr. Antonio Cumbane, has limited support and a wide range of other responsibilities.

[56] It should be noted here that Mozambique was the only participating team that did not answer the UNIDEV survey.

challenging in the extreme. Given the main program purpose to engage the university in stimulating, catalyzing and promoting the transfer of knowledge, and the development of the clusters, a useful strategy could have been to limit the initial choice of clusters to those closer to the University. The selection of such a vast range of locations in Mozambique was most likely guided by concerns for regional equity and the fact that the majority of students and researchers are in Maputo. This provides one example of conflicts between immediate efficiency and effectiveness versus principles and goals of equity. Local facilitators were needed in distant CIs and it is impractical and inefficient use of financial resources to expect Maputo based facilitators to offer close support to them. This was noted in one report[57], but this observation was not enough to cause a change in direction. Even though this was an obvious challenge and was well noted, the multiple advisory and learning mechanisms provided through the Steering Committee, the MOU with Kampala, the meeting of PACF in Mozambique, and the support of the Swedish counterparts from VINNOVA and SICD, as well as the supervision at the local embassy, were apparently insufficient to solve the problems encountered.[58]

It was stated in interviews that there were problems in accessing the Sida funds due to delays at Sida and then exaserbated due to the procedures at the university, which were difficult and bureaucratic. It was also stated that there were design differences between the countries – the cluster projects could only access funding to hold meetings, and not activities at the cluster level, and did not have the seed funding of 10–20,000 SEK per cluster that the Tanzanian and Ugandan clusters enjoyed, and it has been noted above that there were funds for CI workplans as in other countries. It was also stated that with the difficulties in accessing and using the funds, 10 percent of the funds (225,000 SEK) was returned to Sweden as it could not be used within the approved time period.[59] The lack of detail in the final report does not make it clear what the funds were in fact spent on. And even if this amount (which was similar in size to the addi-

[57] Trojer, 2007.

[58] The fact is that multiple advisory supports designed into a project can fail to solve actual problems encountered. This can be a major source for inefficiency and ineffectiveness and also a note of caution for the objectives of large regional initiatives such as PACF. The same fact is also noted in the development of BIO-EARN and would need to be examined to improve the performance of Bio Innovate.

[59] Source UEM Final report for period: 2006–2009.

tional incentive support to the more successful clusters) was not spent, it meant that approximately 1.2 million SEK was spent in 12 months, which appear to have focused on providing the planned inputs. The narrative report suggests that the bulk of the resources were used in activities such as "building capacity" of additional facilitators, meetings and expanding the numbers of clusters in the program. Neither the reports nor the field visit during this assessment provide much evidence of outcomes at the cluster level.

We believe most of the challenges faced by the project are likely due to the larger country specific barriers pointed out in another Sida evaluation – high levels of poverty; low levels of education, including higher education, and a high level of illiteracy; the system of higher education struggling with problems of quality, efficiency and inequality, lack of basic scientific infrastructure, and weak capacity for Ph.D. training and doctoral studies; and the system of research, innovation and technology in early stages of development. Within these larger obstacles some of the design problems in cluster choices and sequencing of activities added to the difficulties in Mozambique.

A NEW BEGINNING

At this time the role of the coordinator has changed at the university. He has been appointed the Director of the Center for Research, and is also responsible for the office for technology transfer. This new position reports to the vice-chancellor of UEM, thus providing greater autonomy, authority and a university wide mandate. He has been the main person who prepared the proposal for the second phase for a total amount of 5.5 million SEK.[60] This has been approved by Sida and is now providing for a four- year project, which began in 2010. The location of the project funds has been moved to the Ministry for Science & Technology, which is the new agreement partner. This has the positive potential for greater government support and involvement. A new institute to oversee the support for Small and Medium Enterprises has been created and there are plans to use this institute to mainstream cluster activities in Mozambique.

[60] The proposal for the second phase, Sida assessment and approval documents, were not available with the evaluators. As a result detailed comments on the design are not possible.

The coordinator believes that there will be no management problems because the ministry had asked him to continue coordinating the project, as he is the one who knows it well. It is a good opportunity for him to interact with the government and popularize the cluster program. He is going to lobby to have it mainstreamed in government programs. He says that his first activity within this second phase is to organize a study tour to Uganda for himself and cluster facilitators, to learn from that project. He is convinced that the future is much brighter.

The new location of the project could in fact resolve the difficulties faced within the University. It could allow greater linkages with government and with other industry-supported institutions, ranging from technology support, finance, legal, quality self-organized institutions such as business and trade associations; and support existing institutions such as the National Cleaner Production Centre (NCPC), Export Promotion Center, the Mozambique Institute for Promotion of Small and Medium Enterprises (IPEME), as well as the Private Sector Association of Mozambique. The Ministry management of the Sida contributions for the National Research Fund[61] has been reviewed positively. It potentially solves the challenge where the project design covering large distances in the country may simply be too unmanageable and inefficient for the UEM and should be left to these other organizations. Well performing support organizations need to be brought into the cluster arrangements. But it has to be acknowledged that additional efforts would be required to rebuild the trust among the stakeholders, in particular the enterprises. The stop and go nature of the efforts to date have likely undermined trust.

The new arrangement at the national level with the Ministry, if it works well, could possibly hinder one of the cluster projects' goals of making greater using of the knowledge at the universities for economic activities and also to allow this exchange to enhance the

[61] Sida, 2010, reports is an in-depth assessment of Sida support to Ministry of Science and Technology with special attention to the role of National Research Council (FNI) during March-April, 2010. It also looked at the role of the Regional Centres for Science and Technology (CRCTs), and tools for promoting science, technology and innovation governed by the Ministry. The overall assessment is that the FNI, considering contextual and infrastructural factors, well lives up to what can be expected from a very young national research funding organization both in terms of research administration and management of funds. Since the start it has made substantial progress in the development of its institutional context and good operational practice.

training and research. The lesson could be that when an agent such as the University in this case is too weak in performing its basic functions, in its administration, management and is possibly stressed with increased demands for its core services of producing graduates, it may not be able to provide the nucleus for cluster initiatives, without internal improvements.

RECOMMENDATIONS

1. Review the impediments to previous implementation efforts including the lack of funding for key activities and ensure these are removed. Such reviews are always difficult and have a potential to embarrass key actors. But finding ways to undertake them and to use the lessons to remove obstacles is an important part of the learning process.
2. Ensure the inclusion of additional resource people with backgrounds in key areas of importance for any commercial activity – accountants, financial analysts, economists, market specialists, business consultants, and social scientists are some of them who should be brought in.
3. Recheck that all the clusters identified are the ones that should be promoted. This should be done with the use of more explicit criteria that should be developed for the likely success of cluster initiatives supported in the future.
4. Review the role of individuals selected as facilitators to ensure that the required range of expertise is available and they do in fact have resources of time and finances to work with the clusters.
5. Improve upon the diagnostic work, but only after some of the priority activities already identified and trust building activities have started.

REFERENCES

Annual Report of UEM to Sida, for January – December 2008, Date of submission: 23 March 2009.

Lindroos, M., Sida PROMEMORIA, date 18 September 2007.

SAREC letter, from the Head of Division to the Rector, dated September 24, 2007.

Sida, The National Research Fund (FNI) as a Tool for Research Capacity Building in Mozambique An In-depth assessment of Sida support to Ministry of Science and Technology, MCT with-

in the Research Cooperation with Mozambique, Sten-Åke Elming and Kenneth Abrahamsson, Sida Review 2010:15.
Trojer, L., Report on second visit in Mozambique 2007, November 2007.
UEM Final report for period: 2006–2009. Research programme title: innovation system and innovative clusters in Mozambique. No date.

LIST OF INTERVIEWEES-MOZAMBIQUE

Name	Organization	Role in Cluster	Email
1. Geraldo Nhumaio	UEM	Facilitator-cassava	Geraldo.nhumaio@uem.mz
2. Faustino Rodrigues	Mozambican Bureau of Standards	Facilitator-cassava	faustomoz@yahoo.com
3. Antonio Cumbane	UEM	National Coordinator	ajcumbane@yahoo.co.uk
4. Rui Vasco Sitoe	UEM	Facilitator-wood cluster	r-v-sitoe@hotmail.com
5. Yolanda Fernandes	Entrepreneur-wood cluster	Cluster member-wood	fernandesyola@hotmail.com
6. Maida Khan	UEM	Facilitator-Fruit Cluster	Maida.khan@uem.mz
7. Bruno Araújo	UEM-Faculty Agriculture	Facilitator-Cassava	baraujo@uem.mz

There was also one facilitator who completed the web-based survey. The responses have been integrated within the report above and not displayed separately.

6 The Pan-African Competitiveness Forum (PACF)

BACKGROUND

The Pan African Competitiveness Forum (PACF) is a new organization that emerged from the ISCP activities and from the collaboration with The Competitiveness Institute (TCI).[62]

The results and experiences in East Africa and the support of TCI, encouraged the key stakeholders to set-up a regional/continental forum for "competitiveness" in Africa. It was launched at a conference organized in cooperation with the African Union Commission (AUC) Directorate for Industry and Trade on April 16, 2008, attended by 110 people from the different sectors relevant to Triple Helix work, from 22 African and 10 other countries.[63] A follow on conference was organized in 2010.[64] The Sida contribution for the period 2008–2010 was SEK 3,070,000.

The PACF creation was prompted by the desire to promote innovation and cluster based initiatives across Africa. The 1st Pan African Competitiveness Forum endorsed the establishment of a collaborative structure – with a "General Assembly" for all PACF participants; an "Advisory Board" with initial representation from 16 African countries, the African Union (AU) and The Competitiveness Institute; and, an "Executive Board" – appointed by the Advisory Board – with 7 members, representing African Union; government institutions; knowledge institutions; and private sector stakeholders in North, East, West and Southern Africa.

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62 This section is prepared by Amitav Rath based only on documents available and selected interviews with PACF organizers.

63 The idea to establish PACF was conceived at the 8th TCI Conference in Hong Kong (2005), followed up at the 9th TCI conference in Lyon, France (2006) and a Steering Committee was constituted at the 10th TCI (2007) (from proposal document). Further activities in Africa included a "Seminar on Pan-African Competitiveness" in Addis Ababa in April 2007, through the initiative of ISCP – East Africa stakeholders; then in September 2007 in Cape Town; and in January 2008, a final PACF preparatory meeting was held during the All African Leather Fair in Addis Ababa.

64 Source is the information provided in the ToR and also in the draft proposal to Sida for PACF activities in 2009 – 2012, by the authors Mwamila B.L, Nawangwe, B., Lucas, C. and Trojer, L. version dated December 23, 2008.

A 2nd meeting of the PACF Advisory and Executive Board was organized in Maputo on 28–29 August 2008 in conjunction with the "5th Eastern African Regional Conference on Innovation Systems and Innovative Clusters in Africa" that took place in Maputo on 25–28 August 2008. The idea for "Lightning 1000 Fires Competition" which aims to support the initiation of 1,000 new cluster initiatives across the continent was discussed, which was seen as a competition for innovation and cluster based competitiveness initiatives in Africa, where the initiatives will be selected from a larger set of proposals and then receive seed support. From among those selected, the clusters that perform well, would be eligible for additional support. Another parallel initiative emerged for an "African-European Climate Innovation Initiative", promoting climate innovation technologies and applications, that could mitigate climate change and also, offer development opportunities to African businesses and people. The summary of PACF activities, structure and instrument; and the 2009–2011 draft work plan were discussed and it was stated that Sida welcomed an application for three year seed funding for PACF.

The PACF agreed to partner with the "Scandinavian Institute for Competitiveness and Development" (SICD), located at Blekinge Institute of Science and Technology, that emerged from the partnership of VINNOVA with ISCP – EA. SICD has decided that its mission is to support developing countries on cluster andinnovation based competitiveness initiatives.

The first activity was a workshop held on March 10, 2009 in Nairobi, Kenya. Here the expert group included the SICD, Cluster Navigators, VINNOVA and University of Dar es Salaam. The KGroup, local consultants Managing Director and its senior partner, Dr Kieyah. The workshop discussed Kenya's development constraint to be not a lack of market but rather the lack of capacity which is cluster specific. That leads to the cluster initiative as an organizing mechanism focusing on firms engaged in collaborative activities in a specific geographic region giving rise to increased competitiveness and innovation. The purpose of the workshop was to engage experts and major stakeholders and to deliberate the viability of clusterization in Kenya.

PACF and SICD followed up with three training programs for cluster facilitators, two for Nigeria and Gambia; and, one for Ghana and Senegal (11–14 October 2010). The second training programme in Nigeria was conducted by a team of SICD and Tanzania and Uganda trained facilitators over a four-day Facilitators training

course in Abuja, Nigeria for trainees from Nigeria and The Gambia. The course was conducted from 4th to 7th October 2010, in partnership with the Raw Materials Research and Development Council (RMRDC) in Abuja.[65] This workshop included three facilitators from The Gambia and 31 from Nigeria, who represented 3 Clusters from Gambia and 10 from Nigeria and covered textiles, oysters and rice processors from Gambia and kaolin, vegetable, brass, glass, rice mills, leather & shoe, furniture, tanning, cassava, bronze, textile, and ICT clusters in Nigeria.

It is reported that the training programs "worked very well", the programs made use of the trainers (trained earlier under the ISCP program) from Tanzania and Uganda. The use of the experiences from Tanzania and Uganda were said to relate more directly to the participants from the other countries.[66] Thus the dissemination of the knowledge and capacity building transferred can be seen as one outcome of ISCP-EA and the PACF.

The plans are for Sida funds to provide support up to USD 5,000 to pilot initiatives for up to eight clusters in Nigeria with the conditionality that a minimum matching local resources of at least USD 5,000 must be found and there should be linkage between research and industry.

The RMRDC is expected to provide financing for the initial activities for the pilots with all clusters attending the training to prepare business plans and make submissions to the National Steering Committee by 15th November 2010. These will be assessed by both the NSC, with recommendations to PACF and SICD for final comments. Of these 8 will be selected from the expected 10–12 proposals anticipated building a level of competition at the CI level. Follow up and assessment by the SICD and PACF international experts is planned for June 2011, and determine the 8 best performing CIs for the Sida support.

The PACF is planning for the next training programs in Kenya and Ethiopia in 2011 and is looking for appropriate host/anchor institution for the training and PACF activities. It has been registered as an NGO under the Tanzanian Societies Act.[67]

[65] Chisawillo, P. 2010. Reflections on the Cluster Facilitators Training Programme, Abuja, Nigeria 4–8 October 2010.

[66] Views of SICD trainer and also of those interviewed in Tanzania and Uganda.

[67] With the Certificate of Registration No. S.A. 16,713, on 28 December 2009. Source PACF INSTRUMENT (CONSTITUTION) and registration certificate.

FINDINGS AND RECOMMENDATIONS

The following time line shows the evolution of PACF from the idea stage to its first outputs.

2005	2006	2007	2008	2009	2010
Idea conceived - 8th TCI Conference, Hong Kong	Follow up - 9th TCI conference in Lyon	Steering Committee formed - 10th TCI September Seminar on "Pan-African Competitiveness" Addis Ababa April	January final PACF preparatory meeting at Addis Ababa. Launched at AUC April. 2nd meeting of Advisory / Executive Board in Maputo, August. 2009–2011 Draft work plan.	Sida approves proposal? March Nairobi workshop	Training – Nigeria, Gambia October – Nigeria, Gambia & Ghana, Senegal

Among the positive outputs that can be observed with regards to PACF is that it indicates the enthusiasm of those involved in the cluster initiatives in East Africa, especially from Tanzania and Uganda. The documents seen show that the PACF has been organized with considerable attention to the details of its structure, governance and membership. It has a very ambitious and broad vision to "light a 1000 cluster fires" across Africa. It is noteworthy that the PACF training workshops provided a scope for some of the persons trained in Tanzania and Uganda as facilitators to transfer their new capacity and experiences to other countries.

It is not surprising that given the common ownership with ISCP stakeholders, there is as yet, very little information available at the outcome levels for any cluster initiatives undertaken in the new countries, as was seen for the three national level cluster initiatives. In the absence of such data, it is not possible in this evaluation to state with evidence the success or lack there of for PACF. But drawing from the findings and conclusions from the country studies in Mozambique, Tanzania and Uganda, it is our view that the enthusiastic support for PACF is not matched by an equal degree of awareness of the likely challenges that such an initiative will face, when expanded across the continent. It has been reported earlier that the work in Mozambique suffered from many challenges from the start with few observed outcomes. This happened in spite of the large Sida investments in the country and at the University, the MOU signed between the three Universities in the three countries

to provide support and joint learning and the holding of a PACF meeting in Mozambique. Similarly, our field reports on Tanzania and Uganda show that there are many gaps in each country that need attention. While the PACF successfully completed the planned outputs of three training programs for cluster facilitators, two for Nigeria and Gambia; and, one for Ghana and Senegal in 2010, the first activity initiated in Kenya could not be followed up due to a lack of interest from local partners.

Effective cluster management appears to us to pose serious challenges that have been underestimated by the PACF. The success of the cluster initiatives require a number of inputs to be provided simultaneously, with a high need for locally coordinated actions and management, that is fully engaged in the local contexts. The understanding of the requirements must also keep pace with the changes over time. These are inherently difficult for a pan African organization and would require a high management cost that may not be effective.

On the other hand one of the goals of PACF "To provide a platform for knowledge sharing and the building up and expansion of the knowledge base on clusters and cluster based development initiatives in Africa" is a lower cost and lower risk endeavour at least for the near term of 3–5 years where the outputs are highly relevant for development. There remains much to learn about CI and how they can be made more effective and useful. Not only do we expect new and improved information from the Sida supported initiatives in the near future but these can also be supplemented by information arising from other donor supported efforts in Africa and elsewhere as well as from new evaluations currently underway in the Nordic countries.

REFERENCES

Chisawillo, P., 2010. Reflections on the Cluster Facilitators Training Programme, Abuja, Nigeria 4–8 October 2010.

Draft proposal to Sida for PACF activities in 2009 – 2012, by the authors Burton LM Mwamila, Barnabas Nawangwe, Carlos Lucas and Lena Trojer, version dated December 23, 2008.

Report on the 2nd meeting of PACF Advisory board / PACF Council, 28–29 August 2008, Maputo, Mozambique.

SICD, Power Point on Cluster Development and Support, Cluster Facilitation Training Workshop – Ghana and Senegal, 11–14 October 2010.

Consultative Workshop Report of meeting held: March 10, 2009, the Serena hotel, Nairobi, Kenya.

PACF Instrument (Constitution)

THE PACF Structure and indicative regional chapter boundaries, October 2008.

7 Bolivia: Universidad Mayor De San Simón (UMSS)

BACKGROUND[68]

The support to the Universidad Mayor de San Simon (UMSS) in Cochabamba[69] is different from all the other country cases in being one component of a large bilateral research support and capacity building program with financing of 64 million SEK for 19 different activities.[70] The overall program is broken into five areas, within which one areas is defined as "Research Management" with five activities – improve research policies and management; a research fund; fortification of institutional capacities to construct and to participate in innovation processes; strengthening ICT support for scientific and technological development at the UMSS; and improving scientific and academic information. Of these 19 projects, the present evaluation study has mainly focused on the activity "fortification of institutional capacities to construct and to participate in innovation". This project recived financial support of two million SEK (third in the group of 19 activities supported, see annex 1), within the project area of research management, managed by the Dirección de Investigación Cientifica y Technológica (DICYT) at UMSS.

Previous assessment of Sida's support to the UMSS was conducted in 2006.[71] It found that Sida support had improved both the quantity and quality of research, contributed through new PhDs trained under the "sandwich programs" and their subsequent outputs; and, it had expanded the areas of research to introduce more

[68] This report was prepared by Fernando Prada and the team of FORO Nacional Internacional, based on documents reviewed and field visit and interviews by Fernando Prada in December 2010 in consultation with Amitav Rath.

[69] A similar program is being implemented at the University of San Andres (UMSA) in La Paz, but it is in an earlier stage compared to the one in the UMSS. The UMSS is providing advice to the UMSA for their program.

[70] Sida's assessment and approved budgets of the cooperation, dated 3 July 2007 and updated on 2 September 2008. The distribution of resources for all 19 activities is provided in table 1.

[71] See for example, Thulstrup, E., Ramiro, M. and Decoster, JJ. 2006, "Building research capacity in Bolivian universities", *Sida Evaluation 06/12* Department for Research Cooperation, Stockholm: Sida. The first five reports included in annex 3, also provide evidence of these issues.

topics, particularly in the areas of food and agricultural. The bilateral program had increased the number of professionals working in laboratories and teaching; and the researchers had access to better and specialized equipment. It also concluded that UMSS had improved its internal rules and processes to facilitate research. These evaluation was less positive on other dimensions of outcomes. They noted there was a low priority of research for students; and even among professors, who have to divide their time between teaching, and managing projects – reports, fund seeking, procurement and service contracts. In terms of use of knowledge, it noted that extensions services were weak and the university were trying to organize and improve this role.

THE CLUSTER INITIATIVE

Encouraged with the developments of the 2003 TCI conference that led to an initiative on innovations and clusters in East Africa (described in earlier chapters), in 2004 Sida sponsored delegates from Bolivia, Honduras and Nicaragua to participate in the 2004 TCI Conference on Innovative Clusters held in Ottawa. Linked to this conference, researchers from the Chalmers University of Technology worked on an "action learning" research project, with stakeholders in the three countries, on an "Innovation Cluster Model", with UMSS as the partner in Bolivia. In Bolivia the UMSS ultimately decided in 2008 to partner with VINNOVA and the Innovation Project in Bolivia[72] was approved by Sida as one activity with only about three percent of the total budget of the renewed and much larger bilateral research support program of Sida.

According to Mr. Eduardo Zambrana, director of the DICYT ("Office of Scientific and Technologic Research" in English), this program was mainly designed with an academic focus.[73] The activity was located within a larger program, conceived to further the

[72] The ToR states that Sida contribution was SEK 1.26 million for 2007–2010 but the Sida assessment states it was SEK 2 million.

[73] In the assessment memo that approved the bilateral research cooperation the Swedish partner had not been selected and there was little content to what would be done, no explicit systemic vision of the Triple Helix or Clusters where the university – industry – government and other stakeholders work together to develop increased innovations in firms and clusters. UMSS first negotiated with Chalmers University of Technology on designing a project to make the UMSS an "innovative university". But for reasons not clear, this initiative did not get support and then UMSS decided to partner with VINNOVA.

ongoing framework of cooperation with Sida to strengthen UMSS research capacities, and their use, which are in addition to the work done under the Triple Helix/Clusters framework.[74] Mr. Zambrana, explained that UMSS had taken the lead to support clusters as part of its extension role and the Cluster Initiative is being implemented by the small office for extension – the Unit of Technological Transfer (UTT).

AREAS OF SUPPORT AND ACTIVITIES

As explained by the UTT, the project aims to advance the objective of "fortification of institutional capacities to construct and to participate in innovation", the UMSS is undertaking initiatives and activities, which can be grouped in three areas:

- Support of clusters.
- Improvement of innovation capacities among students and firms.
- Transfer and adaptation of technologies developed at the UMSS faculties to improve the productivity of the private sector production.

The Unit of Technological Transfer (UTT) at the Faculty of Sciences of UMSS has engaged in two cluster initiatives and new initiatives are being started. The first was its engagement with the food cluster in late 2008, and that was followed by the initiation of work with a leather cluster in 2009. New initiatives begun in 2010 are currently in formation and receiving support, and include textiles, manufacture of wood and timber, medicinal plants and local knowledge, and, the production of machinery. Table 1 summarizes the main characteristics of the food and leather clusters.

Activities for the support of clusters include the organization of producers, raising awareness and consolidating support from local authorities, improvement of commercialization networks and certification. For example, the food cluster members now have available a store to promote their products and it is entirely financed by the UMSS. In addition, they also get support for marketing and advertising – both the leather and food clusters have received support to create, design and disseminate fliers to advertise their products, as

[74] See UMSS/Sida/SAREC/VINNOVA, 2007, Report Innovation Project. This document presents the initial preparation process of a Triple Helix like program with the UMSS (See notes on "Phase 2: Introducing innovation system and cluster approach in Cochabamba and Bolivia based on Triple Helix collaboration").

well as support to create labels and brands. One idea given by the Cámara Departamental de la Pequeña Industria y Artesania Productiva de Cochabamba (CADEPIA, a regional chamber of commerce representing SMEs in the industrial and handicraft sector) to support the activities of the food cluster is to include local cluster producers in food purchases for social programs. This will require local producers to make new investment to be able to provide food products at the scale required. Nevertheless, this is an area where the UTT is working. Researchers indicated that there is plenty of capacity to adapt scientific knowledge to the needs of SMEs. As an example, the Center of Food and Natural Products at the UMSS is developing capacities to provide services of certification of food products at a fraction of the current cost, but this still needs to be implemented.

Table 7.1. Summary of two Clusters in Cochabamba

Cluster	Members	Features, activities and outcomes
Food	45 firms	The food cluster work began in late 2008 with 25 SMEs but it has expanded to 45 members as of December 2010. Members are mostly SMEs with between 3 to 5 workers, and some mid-sized firms. Activities include: (1) training and workshops on sanitation and certification, good practices in food production, and management; (2) commercialization, such as the organization of fairs, preparation of stands, and provision of a store to display and sell products of the cluster; (3) market intelligence, such as the preparation of five market studies for different potential products; and (4) design of prototypes to improve production, such as a fruit dehydrator in alliance with STEVIDA, a private firm.
Leather	43 firms	The leather cluster was created at the end of 2008, after the First Workshop of the Leather sector organized by VINNOVA (20/11/2008), and as of 2010 had 43 members – mostly SMEs with less than ten workers. Activities are grouped in three strategic lines: (1) Branding and marketing, including preparation of a cluster brand, preparation of flyers to offer products of the cluster; (2) quality improvement, training to improve tannery techniques, courses to improve management (Kaizen method), accounting; and (3) design, to improve product design with some workshops, and (4) the introduction of two new machine prototypes to attach soles to shoes, and for cleaning leather dust.

OTHER WORK

There are several additional groups of activities towards promoting innovations. First, the UTT aims at *gathering support from the various laboratories and research institutes for specific demands of the private* sector in parallel with their own process of consolidation and strengthening capacities. The main instruments for this aim has been training activities and information workshops organized by the UMSS, in topics such as intellectual property, marketing, market research, organization, labeling and certification, accounting and formalization. There are ongoing plans to extend these training activities with the support of other faculties within the UMSS, such as legal advice, industrial organization, market research for exports and commercialization networks.

Secondly *promoting entrepreneurship among students and firms* constitute another area of support of private sector activities, and have the potential to increase its impact in the future by increasing its current scale. The UMSS is periodically organizing an "innovation and entrepreneurship competition" among students. The 2008 and 2009 competition gave prizes to several projects related to industrialization of native food species as camu-camu and tuna, information technology applications to education, and silver craftwork, among others. Nevertheless, there are less resources available to the implementation of these winning projects. Lack of credit access is a limitation to implement these projects.[75] So far, there have been 300 students that have participated in these competitions, received training in entrepreneurship and developed business plans – there are 60 business plans that students have already developed according to the UTT. In parallel, the UMSS is promoting a seed capital facility for entrepreneurs (EMBATE in Spanish). At this point, EMBATE has selected several investment projects for financing, but the available funding is still of small scale.[76]

Credit access is one of the main limitations to implement these ideas. An important activity to improve entrepreneur's access to credit, but still at implementation stage, is the support from

[75] Prizes and support for implementation amounts up to Bs 15,500 or US$2,200.

[76] In November 2010, the Vice-Minister of Science and Technology organized a workshop between EMBATE and the network of seed capital funds in Bolivia (Incuba Bolivia) to coordinate similar initiatives in Bolivia. See http://cdccba.wordpress.com/2010/11/23/primer-encuentro-nacional-de-incubadora-de-empresas-de-base-tecnologica-de-bolivia/

the Fondo de la Comunidad. This is a financial firm that supports business projects and provides microfinance services. The UMSS is working with this institution to provide funding in the future to these initiatives; and the Fondo de la Comunidad, in opinion of its representative Mr. Guido Céspedes, considers this an important strategy to expand their activities: "a consolidated cluster means more potential clients, but our [Fondo de la Comunidad] support means that we are improving the productive sector capacities and its competitiveness".

Adapting and developing technologies to support the production process of firms in the clusters constitute a final group of activities but this needs improved knowledge of market conditions and further testing of the initiatives with market studies. For example, the UMSS have created prototypes of two machines to support the leather cluster (a pneumatic machine to attach soles to shoes, and a machine to remove dust from leather). Although these prototypes could solve some problems at the production level, it is not clear whether these are viable under economic/market feasibility conditions. Studies of alternatives to the same machines and other technologies, of potential market and demand, a plan to develop intellectual property over the prototypes, and a clear assessment of the cost-benefit of the use of this machine in the production and by individual firms, as well as how to obtain finance to develop these machines all require deeper assessment than has been undertaken so far.

OUTCOMES

As mentioned the main focus of this study was to examine the outcomes of the first thematic area "fortification of institutional capacities to construct and to participate in innovation". The work in Bolivia started only in late 2008 and so it is early to clearly asses outcomes, and certainly not the longer term potential impacts. At this time, it can be observed that the organization of the UTT at the UMSS has contributed to the convergence of several activities inside the university in a more programmatic way to support innovations and the application of knowledge in the private sector. In this regard, the UTT has shown several achievements, although still in a small scale, but with a potential to extend these ideas at a low-cost. The present study has identified the outcomes of this program in several dimensions.

At the university level, the project has developed an implicit methodology to support clusters, whose scope is expanding through the UTT outreach activities. By supporting part of the administrative cost of managing research and most of the coordination costs to implement the extension role of the UMSS, the program (through the UTT) have been able to become a focal point to integrate the activities of the actors of the Triple Helix. Using Mr. Zambrana words, donors are usually reluctant to finance administrative costs and tend to focus on research and development projects. However, the real challenge consists on knocking at other actors' doors to get their support and convince them to participate in clusters and, in general, in the UMSS activities. The leading role that the UMSS has taken with the food and leather clusters have allowed the beginning of a schematic approach whose main interventions are coordination and advocating activities, meeting with national authorities, case studies on the benefits and the feasibility of clusters, and getting the support of key stakeholders such as CADEPIA, the government and researchers at the UMSS labs and faculties.

Although the components of the Sida-UMSS program of support are part of the same program, they have worked independently. Nevertheless, they show some convergence in the area of promoting and expanding the extension role and activities of the UMSS. As previously indicated, the apparent misalignment between research capacities and SMEs requirements regarding the extension role of the UMSS was already known at the design stage of the project. There appears to have been some progress in alignment because of the University plan to improve its extension role. In general, four projects within the Sida-UMSS program (see annex 1) aim at improving management capacities at the university to strengthen the extension role at the UMSS, while the other 15 correspond to specific research projects. This mismatch is understood at UMSS and the DICYT is currently implementing measures to better integrate the applications from the UMSS research and lab facilities to the cluster programs – and in general, to the extension activities of the UMSS.

At the firm level, this project has been able to organize producers and firms under a competitiveness agenda. As previously indicated, a main limitation of technology transfer and cluster projects is the weakness of the productive sector in Cochabamba (and Bolivia in general, because this is also the case of the UMSA). However, it has been relatively easier and faster to organize producers in several other clusters in

2010 after the accumulated experience of the food and leather cluster – a learning effect that could be important in the future to expand the reach and impacts of the UMSS support. For example, the textile and wood and timber clusters, created in 2010, are already receiving training to organize their member firms and planning their activities, vision and mission.

At the level of other actors involved indirectly in the project, it is perceived that researchers and faculties at the UMSS are devoting more time and resources to the competitiveness agenda, but this could have a greater potential if more faculties and schools within the university participate with the aim of expanding the scope of services to the private sector. So far, researchers and faculties within the science area have been the main actors supporting clusters through the UTT. However, the particularities of the targeted private sector in Cochabamba (low-productivity SMEs) means that other faculties could provide key support in areas such as market studies, legal advice, development of brands and marketing strategies, among others. Although the support of faculties such as economics, law, and humanities have been specific to some activities within the cluster, the demonstration effect is an incentive to further this support and involve other faculties to increase the capacities of the UMSS to support private sector activities and improve the extension role of the university as a whole.

It is worth noting that the activities related to raising awareness and consolidating support from local authorities have achieved a formal commitment from them to further the competitiveness agenda. In this regard, the results from the survey in Cochabamba indicates that the UMSS is one of the few institutions that is committed to improve clusters along with the Industrial Chamber. Here, the UMSS has an advantage to influence public policy due to its privileged position in Cochabamba and its prestige helping firms to organize. Nevertheless, this is a feature that usually is under the radar: the UTT has held several meetings with local authorities in order to integrate this program in a common framework for competitiveness in the region, and this outreach activities have extended to representatives of larger firms, commerce chambers and other institutions with interest to further the competitiveness agenda.

CONCLUSIONS AND RECOMMENDATIONS

The leadership of the UMSS, particularly the UTT and its personnel at offering and coordinating the support of the science faculty and other UMSS institutes and faculties, has been key at coordinating the different components of the two main existing clusters in Cochabamba (food and leather); and this role is expanding with the formation of other clusters. UMSS has engaged in supporting the formation and consolidation of productive clusters, mainly through two channels. First, direct support of private sector activities through development projects that individual faculties, laboratories and professors are implementing to support productive activities and indirectly, they promote associations between producers. Some of these activities also promotes innovation by improving production techniques and inputs (seeds, training to farmers and firms, and land, among others). Mr. Zambrana argues that this correspond to "NGO-type" of support in the sense that these are mainly individual projects and they are not part of an integrated program. This modality is probably inefficient since different faculties and researchers tend to work separately under this model, but it is, however, still a common way that the different faculties and research institutes collaborate with the private sector. In the future, these activities carried out independently by different faculties can also contribute to a more programmatic support from the University to the private sector. Since the UTT has shown some progress with the food and leather clusters, it is likely that in the future a growing part of the UMSS support to clusters through this office and contribute to obtain a much larger scale of UMSS extension activities.

Regarding evidence of better performance of the economic agents (SMEs) in the clusters, it is important to state that there is as yet no data on performance of the actors nor a baseline. There is some evidence of more sales mainly through the stores that the clusters are providing through the support of UMSS. Here, cluster producers sell their products, harmonize their production and improve labeling and information, receive support to advertise their products through fliers for example. This is a clear improvement, but there is not enough data to assess the value of these benefits. It would be necessary to compare their sales over time and with other similar producers outside the clusters, to attribute the impact of higher sales to the intervention and not to an overall improvement of SMEs or the economy. UMSS will need to improve data collection in order to

show more evidence of impacts in the future by starting, to systematize data about the SMEs participating in the cluster, and these – financial statements or similar, will also be crucial for future growth through loans.

There are two other areas of concern. One is indicated by the low level of participation of stakeholders in the electronic survey. While this could be due to many reasons that have little to do with the success of the initiative it raises concerns on the degree of stakeholder involvement. The other is the lack of systematic project documents that are outcome oriented and can assist in the management and coordination of the large bilateral support that is intended to be increasingly outcome oriented. In addition, the known characteristics of the economic context, the weakness of the SME sector, with a few large companies and a majority of micro and SMEs with low productivity and capitalization cannot be easily overcome as they have low capacity and resources. The producers are fragmented and their products tend to be similar but with heterogeneous quality. CADEPIA, an organization targeting these SMEs with the aim to formalize them and improve their productivity through training in managerial and administrative capacities, indicated that there are no incentives for association and there are no instruments in place to encourage associations between small firms in most sectors beyond the work by UMSS.

There is also an issue of alignment between the type of research capacities that the UMSS has and the type of support that most SMEs in Cochabamaba require. This issue appeared frequently in the interviews with researchers and professors in laboratories and science faculties at the UMSS. Some topics and research areas are not necessarily suitable for SMEs in their current situation. For example, the biotechnology lab is experimenting with applications to improve the quality of native crops, but its application would be more suitable to large firms because of the scale needed to become economically feasible. SMEs mostly need support at formalizing their activities, associating with other producers to increase their production scale, adapting technologies at a low-cost to improve productivity, as well as activities such as promoting access to commercialization channels, labeling and certification, and credit and financial support.

Nevertheless, it is important to frame the achievement in the particular context of Cochabamba and Bolivia. First, the weaknesses of the private sector and the clusters imply that the type of interventions

related to the coordination of activities of cluster members – formalization and training of producers and raising awareness in the public authorities of the clusters – are more important now than technological transfer or strategies to consolidate innovation systems. Although technological transfer and promoting innovation are important elements of the plans and are powerful ideas to bring together the cluster members and political authorities, the coordination and advocating role of the UMSS should be recognized as the one having the most immediate impact at forming and consolidating these clusters in Cochabamba. Second, the activities of the cluster are notable given the scarce resources from international cooperation, the government and the university, but their area of influence still covers a small part of the producers in both clusters. Third, there is still a lot of work to do to engage large enterprises in the process of cluster consolidation and potentially mobilize additional resources.

There is a lot of potential to expand some of the achievements described in section 3. First, there is an important demonstration effect, not only considering the dissemination activities of the UTT/UMSS but especially the improvement of the visibility and marketing of the products. UTT has helped the producers creating a logo for the cluster, provided marketing support, contacted producers with government authorities and secured the support from private sector institutions such as producer unions (CADEPIA) and financial service providers (Fondo de la Comunidad). It is likely that more producers will apply for support and information, and if that it is the case, the UTT and other institutions will have to scale up their capacities – because the diversity of producers often requires specific support in a case-by-case basis. Nevertheless, there is an opportunity here to standardize the type of support to SMEs to be able to expand the number of associates of clusters without significantly increasing administrative costs.

Second, the type of support that SMEs in Cochabamba is critical now in the areas of formalization, marketing, commercialization, legal advice, administration and related, but as SMEs grow and the cluster is able to engage a group of larger partners, innovation and competitiveness will take a bigger priority. Therefore, it is important to take measures to promote new ideas to adapt the knowledge of the UMSS professionals and scientists. This implies broader university reforms such as providing better administrative support to projects that professors are implementing in order to free time for research activities and teaching; reducing paperwork to facilitate

implementation, fund seeking, collaboration between faculties, access to public funding; and, as has been clearly indicated in previous Sida assessments, implementing mechanisms to keep the professionals working at the UMSS. Two areas are already working and could be scaled up: mechanisms to promote internships with the private sector and also with the teacher's research projects; and promote the initiatives and entrepreneurships of the students through contests. Teachers and scientists have been supporting these two areas.

Third, the support of Sida have been crucial to increase scientific and research capacity and implement laboratories at the UMSS. In addition, this support have been complemented with additional funding for research management, which has also supported the participation of the UMSS in the formation and work of the clusters. Other organizations, such as CADEPIA, are obtaining grants to support SMEs and informally, are coordinating with the UMSS to sum up efforts to support clusters. Several actors involved in the functioning of the food and leather clusters indicated that a great part of the labor consist of meetings, coordination activities with a several array of sectors and actors, paperwork and training activities, so any future support needs to take into account that this context can cause delays and, as a interview indicated "the private sector will not be willing to participate unless the pace of changes accelerate."

In sum, the UMSS have been able to implement a system to support clusters in Cochabamba, and several positive impacts could be seen in the case of the food and leather clusters, with the direct support of the UTT. However, the results have not been adequately measured in terms of, for example: increased production, use and adoption of better production technologies, or increments in labor and capital efficiency, among others. Therefore, while it has been possible to note the several activities to consolidate clusters, and it has been also possible to recognize some progress and achievements at the impact level such as the networking, participation of SMEs, and improvements in marketing and commercialization networks, among others, this impact is still limited to small networks of producers at the early stages of this project. But there is potential that this impact can expand in the future with the support of the local government. The cluster activities have been incorporated in the local government agenda through an agreement of collaboration between the UMSS and the Local Government (Gobernacion de

Cochabamba), as well as in other agencies of cooperation in specific projects of the clusters (USAID, Spain Agency for Cooperation). Moreover, there is a demonstration effect since local authorities (governor) seem committed to scale up these clusters and are working and getting advice from Mr. Zambrana and the UMSS for this purpose. However, these impacts would take time and resources to consolidate. On the other hand, there is still work to do at measuring these preliminary results quantitatively and that was not possible to do during this study. In addition, the time period for impacts is small at this time, less than two years for some clusters and less than one year for others, and new clusters have started in 2010.

The evidence shows that this support has been key to consolidate clusters, and the UMSS through the UTT and other faculties have a clear role as a hinge between the government, the research capacity at the UMSS and the SMEs. No other actors (government, private sector) have been able to mobilize efforts to improve clusters and no other similar effort could be identified, other than the local government commitment to strengthening "conglomerados".

ASSESSMENT:

Relevance: The intervention is highly relevant as per the needs and priorities of Bolivia and the need to increase capacity for increased outcomes for development.

Effectiveness: It is too early to judge effectiveness but there are promising results.

Impact: Again too early to assess impacts but interim outcomes are positive.

Sustainability: The continuation of funding by Sida ensures immediate sustainability and future directions will depend on outcomes.

Efficiency: The contribution to the "innovation" and use activities is very small and within this small budget and late start it appears reasonably efficient. There is a clear need to increase efficiency through beginning of analysis of firm and cluster level outcomes, and studies on integration of the research components and the application efforts.

The overall rating of this cluster is promising and requires urgent attention in the two dimensions noted above.

SURVEY SUMMARY

Eighteen names were provided by the Bolivia coordinator for the follow up survey. The electronic survey was sent in Spanish on Nov. 20, 2010 and there were three sets of reminders sent, but only six out of the 18 persons responded. Three of the six are from universities, one from a research institute, one from a financial institution and one from a partner. Only three of the six respondents answered most of the questions and they were one from the university, one from a research institute and one from the partner organization. The person from a university had participated in workshops and training to increase his capacity to transfer knowledge; and providing services to firms. The person from the research institute has participated in supporting the leather cluster and the respondent from the partner organization has been involved in creating networks, links and alliances between the stakeholders. As none of the respondents are from a government organization or a firm these sections were omitted. Finally, given the small number of responses, only a summary of some responses deemed most relevant are provided below.

All six persons said they had contacts with the project. The University person said his involvement was as part of the meeting on incubators for technological base firms; and, he also worked in the food and leather cluster in Cochabamba. The person from the research institute said that that the project helped him to better understand about the needs of end users, solve user problems, changed his research orientation, mostly by "learning in the field rather than with the theory."[77] Besides, he learned how to adapt and use innovation ideas in his own work and increased the level of team and interdisciplinary work, as he point out: "because you do new things and are totally different."

The only respondent who had been involved as a cluster facilitator, said he was involved in the food cluster. He received training on 11 November 2008 and he considers it as very relevant to his facilitation role, because "it helped him to understand the methodology of carrying out the activities of the cluster"; but he thinks that more training days were necessary. He used capacity well towards building trust, building linkage with the university, accessing to markets, accessing to finances, and working on all linkage. But his capacities helped in only in a modest way building linkages within cluster and across clusters, accessing inputs and linking with government.

[77] "Porque uno aprende mejor en el campo que en la teoría".

He felt that the food cluster performance was modest in solving production process problems, improvement of production process/service delivery, building trust and linkages within the cluster and externally; and in access to inputs, skilled labor and new sources of capital. He also believes that there was no improvement in developing new products/services, accessing to new and/or wider markets, or accessing to new inputs to the production and/or process, or components.

There was one mention of the Industrial Chamber of Cochabamba having another program/project that worked with clusters.

ANNEX 1. UMSS PROGRAM

Budget 2007–2010 in US dollar, although with subsequent modifications noted in the case of specific projects.

Table 1. Budget UMSS

	2007	2008	2009	2010	2007–2010
i. Strengthening of Research Management at UMSS					
Strengthening of Research Policies and Management at UMSS	750,000	1,000,000	2,800,000	800,000	5,350,000
Research Fund	2,450,000	2,800,000	3,000,000	3,200,000	11,450,000
Fortification of Institutional Capacities to Construct and to Participate in Innovation Processes	300,000	600,000	600,000	500,000	2,000,000
Strengthening ICT Support for Scientific and Technological Development at the UMSS	200,000	200,000	600,000	500,000	1,500,000
The System of Libraries, Scientific and Academic Information at UMSS	200,000	200,000	300,000	300,000	1,000,000
Total Strengthening of Research Management	3,900,000	4,800,000	7,300,000	5,300,000	21,300,000
ii. Science and Technology Area					
Natural Products from the Cochabamba Flora	1,010,000	1,020,000	1,020,000	940,000	3,990,000
Biotechnological transformations: Application and research of Bolivian microbial biota to the benefit of society	1,640,000	1,540,000	1,440,000	880,000	5,500,000

	2007	2008	2009	2010	2007–2010
Technology and Processing of underexploited Tropical and Andean Foods	1,650,000	1,290,000	1,180,000	1,080,000	5,200,000
Energy Project (UMSA-UMSS joint project)	150,000	860,000	1,070,000	920,000	3,000,000
Adequate Technologies in Poor Bolivian Regions Starting from Non Metallic Mineral Resources	150,000	1,070,000	960,000	820,000	3,000,000
Subtotal Science and Technology Area	4,600,000	5,780,000	5,670,000	4,640,000	20,690,000
iii. Health area					
Development of new strategies for the evaluation and prevention of nutritional deficiencies and its relation with the control of tropical diseases	150,000	2,000,000	1,500,000	800,000	4,450,000
Subtotal Health area	150,000	2,000,000	1,500,000	800,000	4,450,000
iv. Social and Humanity Area					
Demographic Dynamics and Life Conditions in Cochabamba's Tropic and its surroundings	400,000	450,000	400,000	350,000	1,600,000
Human Settlement in Chapare IIA (AAHH)	550,000	500,000	500,000	450,000	2,000,000
Sustainable Development in the Tropic of Cochabamba	650,000	650,000	650,000	450,000	2,400,000
Pre-colombian Cultural Dynamics in Cochabamba-Bolivia Part II (2007–2010) (Research-Training-Museography)	650,000	550,000	350,000	400,000	1,950,000
Paleo-ecology, Archaeology and Ethnology in the Valleys, Yungas and the plains of Cochabamba-Bolivia	150,000	500,000	500,000	400,000	1,550,000

	2007	2008	2009	2010	2007–2010
Activity of governing: scenarios, institutions, and strategic actors in policymaking and policy implementation in Bolivia	150,000	400,000	400,000	350,000	1,300,000
University and Higher Education for the Information Society (2007 – 2010)	150,000	1,000,000	800,000	800,000	2,750,000
Energy & sustainable development Governance and citizenship in the oil and gas sector in Bolivia	150,000	500,000	400,000	400,000	1,450,000
Subtotal Social and Humanity area	2,850,000	4,550,000	4,000,000	3,600,000	15,000,000
Memo: Reservation for new projects	0	370,000	530,000	1,660,000	2,560,000
Memo: Total Research environment (ii, iii, iv, and reservation)	7,600,000	12,700,000	11,700,000	10,700,000	42,700,000
GRAND TOTAL	**11,500,000**	**17,500,000**	**19,000,000**	**16,000,000**	**64,000,000**

ANNEX 2. LIST OF PROJECT DOCUMENTS CONSULTED

Project Area I: Research Management at UMSS. Updated 2009-06-11.

Scientific Research Cooperation Program for the Swedish International Development Cooperation Agency (Sida) and the UniverSidad Mayor de San Simon (UMSS) for the third phase of the program. Project: "Fortification of Institutional capacities to construct and to participate in innovation processes". Independent Auditing Report of the budget implementation state done between April 1st and December 31st of 2007.

Sida's assessment and approved budgets of the cooperation with UniverSidad Mayor de San Simon – UMSS, Cochabamba for the period 2007–2010. Enclosure 1. Enclose to Agreement on Research Cooperation Between Sida an UMSS Period 2007 – 2010. Dated 2007-07-03.

Sida's assessment and approved budgets of the cooperation with UniverSidad Mayor de San Simon – UMSS, Cochabamba for the

period 2007–2010. Enclosure 1. Enclose to Agreement on Research Cooperation Between Sida an UMSS Period 2007 – 2010. Updated 200-09-02.

Sida's assessment and approved budgets of the cooperation with UniverSidad Mayor de San Simon – UMSS, Cochabamba for the period 2007 – 2010. Enclosure 1. Enclosure to Agreement on Research Cooperation Between Sida and UMSS Period 2007 – 2010.

UMSS/Sida/SAREC/VINNOVA (2007). Report Innovation Project. This correspond to notes of a field visit to Cochabamba.

ANNEX 3. LIST OF INTERVIEWEES

Name	Organization
Ing. Omar Pérez	Director del Instituto de Investigación – UMSS, Responsable de la UTT
Ing. Rodrigo Osinaga	Coordinador Cluster del Cuero
Wendy Sansetenea	Coordinadora Cluster Alimentos – UMSS
Ing. Daniel Santiesteban	Gerente General – CADEPIA
Ing. Candy Sanjinez	Directora de Desarrollo Industrial
Ing, Roberto Soto	Director de Biotecnologia
Dr. Carola Rojas	Investigador Centro de Alimentos
Ing. AbdonQuiroz	Docente Iinvestigador CIDI – UMSS
Sr. Guido Céspedes	Gerente en el FONDO de la Comunidad
Ing. Nelson Hinojosa	Agroquímico – UMSS
Lic. Ana Maria Romero	Directora del Centro de Aguas
Gerardo Guzman Rustan Roca	Investigador en el Centro de Energía

8 Nicaragua: Innovative University Program (IUP)

BACKGROUND[78]

As noted in the Bolivia study, encouraged by the African experience and the outcomes at the Bagamoyo conference (see ISCP), which in turn was an outcome of the 2003 TCI conference, Sida sponsored 16 delegates from three partner countries in Latin America – Bolivia, Honduras and Nicaragua to participate in the 2004 TCI Conference on Innovative Clusters held in Ottawa.[79] Linked to it and as a preparatory step, researchers from Chalmers University of Technology worked on an "action learning" research project supported by Sida, with stakeholders in the three Latin American countries.

The main purpose was to "introduce and develop a *process*, that will *increase awareness*, cooperation and debate on the role and opportunities that *"innovation clusters"* may have in the development of innovations".[80] An important observation made by the researchers was that while each country introduced cluster thinking as one "method or model" to analyze local innovation systems and competitiveness strategies, they also determined with the local participants, that the cluster model needed to be expanded to include additional stakeholders that are important to the specifics of the innovation systems in the different countries. Revisions were made to include unions in Honduras, the donor community in Nicaragua and indigenous communities in Bolivia.[81] The work, the results and conclu-

[78] This report was prepared by Fernando Prada and the team of FORO Nacional Internacional, based on documents reviewed and field visits and interviews by Fernando Prada in November 2010, and consultations with Amitav Rath.

[79] Participants included 7 persons from Bolivia and three each from Nicaragua and Honduras. Alänge, S. and Scheinberg, S. 2005a. Innovation Systems in Latin America, Sida, p.57. It provides a more detailed background on p. 5. There is an electronic version of Alänge, S. and Scheinberg, S. 2005b, with the 95 pages of the printed version, as well as the presentations made at the TCI conference, that provide almost 90 pages of additional details on the findings and plans for each of the three countries.

[80] Sverker, A. and Scheinberg, S 2005a, p.7.

[81] Ibid, p.20. There is no discussion on why unions or the donors were not considered relevant stakeholders in all countries. The report introduces the stakeholder model on page 18 as belonging to a family of related

sions regarding further steps in the three countries, have been reported in greater detail in the above Sida report.

Following the meeting and subsequent discussions between Swedish partners and the local universities, the outcomes were different in each country. In Nicaragua, the outcome of this preparatory work was the "Innovative University Program" (IUP), approved by Sida in 2007, with the continued partnership with Chalmers University. The proposal was jointly created by a wider partnership, between Chalmers with ten University members of the "Consejo Nacional de Universidades" (CNU). As a result of the motivation of the partners at the CNU, the IUP's primary focus was to stimulate and strengthen the ten Nicaraguan universities to engage in more effective partnerships with the key non-University stakeholders. Sida made a contribution of SEK 8 million for the period 2007–2009.

The earlier work had drawn attention to nine key areas where further in-depth analysis and initiatives were required in relation to barriers and facilitators for "innovation and clustering", with each defined largely by a type of activity or by a key partner. One key area out of the nine appears to have been chosen from the options put forward earlier, called the "Entrepreneurial University", whose purpose was defined "to make the University more entrepreneurial and take an active role in innovation processes in society.[82] The logic chain behind this focus would be that the key constraint to the utilization of domestic research in Nicaragua was the lack of capacity at the Universities[83] (defined and listed below), that when these capaci-

innovation systems concept and on page 19 lists 10 groups of stakeholders that were identified for Nicaragua.

82 Ibid, p. 63 and 64. The name of the activity was changed from entrepreneurial to the innovative university, and there is no discussion in the project proposal or in the Sida assessment why this one constraint was chosen for attention and whether this was the binding constraint.

83 Sida had been engaged in partnerships with Nicaraguan universities from 1980, but in more traditional research capacity building – strengthening research in universities, technical cooperation, scholarships for researchers and students, knowledge transfer programs, conferences and training programs, among others. An earlier evaluation found that in Nicaragua there had been rapid improvements since 2002, where in one University with increased capacity they were able to attract competitive research funds from other sources; the PhD graduates are training new students; many researchers serve as invited experts in national commissions and one had played a catalytic role for innovation clusters. One had approved a research policy in 2003, and the others have prepared draft policies and strategies; and the administration and management of research, audit systems had become more efficient. Boeren, A., Alberts, T., Alveteg, T., Thustrup, E. and

ties are improved it would lead to increased generation of knowledge, cooperation and innovation, by working together with other stakeholders.[84] The project methodology[85] was developed by the collaboration partner, Chalmers University of Technology.

It is important to highlight the portfolio perspective, while the activities supported in the three countries of Eastern Africa and Bolivia, all have used elements of the Triple Helix, cluster models, the case of Nicaragua, while referring to it, does not focus on the Triple Helix. The IUP has similarities in its concepts – though with a wider definition of relevant stakeholders, but the project activities end with the aim to strengthen Nicaraguan universities to engage in partnerships with key stakeholders. It is only in its post project outcomes "to promote innovation" that the five country projects have similarities. Given the focus of the study on the portfolio, and, on "innovation outcomes" going beyond the activities, the present report attempts to find a balance between assessing the particularities of the IUP, together with any innovation outcomes, and has used common methodological elements to allow some degree of comparability for the overall study. Therefore, the summary below is not a review of all the input-outputs and activities by

Trojer, L. 2006, *Sida/SAREC Bilateral research cooperation: Lessons learned*, Sida Evaluation 06/17.

84 According to the proposal, the objective was "to develop and drive an action learning program over a 2-year period that will support the CNU and the 10 leading Universities in Nicaragua in creating (or strengthening) their role, position, competence, structures, management practices and relationships (partnerships) with their key stakeholders (government agencies, industry, unions, communities, financial institutions, NGO's, media, etc.), in society that are needed for contributing to the prosperity of Nicaragua through generating knowledge, cooperation and innovation".

85 The proposal states that an action learning methodology will be followed that supports and builds on the priorities in the universities and CNU that demand further development of the relationships, conditions, structures and processes to make the Universities in Nicaragua more innovative. The theory listed as the "Cycle of Experience as developed by Scheinberg and Alänge (1997, 2000, 2004, 2006) includes the following stages for a complete learning experience: sensation (feelings, worries, trends, issues), awareness (what are the facts, priorities, goal setting), mobilizing of energy (planning and acquiring the resources needed), action (doing), contact (keeping in touch with self, others and goal), reflection-analysis (what are the results of goals and process, mistakes made, learning), integration-standardization (how can we use what we learn in our current work or organization), closure (unfinished business defined, celebration or mourning)". The references are not provided in the proposal.

individual universities, or the project, but an overarching analysis of the indicators towards the final objective. There is an effort to provide sufficient information about the project to allow the reader to understand the initiative.

THE INNOVATIVE UNIVERSITY PROGRAM (IUP)

IUP was designed as an action-learning program over a two and half year period to support the Council of Nicaraguan Universities (CNU) and ten member universities to become "innovative universities". The CNU, the coordinator of the IUP project is a public consortium grouping the ten member universities (four public universities and six private). It is responsible for enacting national higher-education policies, approving new universities and distributing state funds (as per law to transfer 6 % of total fiscal income in the previous year). The stated goals towards the "innovative university" were to create (or strengthen) the University's role, position, competence, structures, management practices and relationships (partnerships) with key stakeholders (government agencies, firms, unions, communities, financial institutions, NGOs and media, among others), in order to generate knowledge, cooperation and innovation that ultimately benefit the Nicaraguan society.[86] The IUP activities were conducted during the 2007–2010 period (the original time period was extended by one year) and these were developed following a previous assessment[87] and used an expanded set of eight sub-objectives (CNU and CIP 2006):

1. To transform the roles and responsibilities the CNU and the Universities have in the current and future innovation system in partnership with the other stakeholders (Government agencies, industry, unions, communities, financial institutions, NGOs, among others) in Nicaragua.
2. To create the policies and strategies needed so the University include innovation, technology transfer and intellectual property as part of its mission and practices.

[86] The Council of Nicaraguan Universities (CNU) and Chalmers University of Technology (CIP), 2006, Proposal for: The Entrepreneurial University Program in Nicaragua. 31 August 2006.

[87] As in Alange and Scheinberg, 2005.

3. To assess and improve the research management process, including plans, designs, methods, networking and management practices that will support the applicability and integration of the research activities and results into society.
4. To develop functions, processes and structures in the Universities in order to support an innovative and entrepreneurial orientation in their vision and practices, particularly in the 'research to market' process, action-learning and extension practices.
5. To further develop the role and career of the researcher and the contracts and incentives needed to ensure the continued development of this group from a research and innovation perspective.
6. To develop an atmosphere and culture at the university (and the CNU/Advisory Council) that promotes more transparency, sharing and learning, through developing a more systematic way of working, reflecting and cooperating with stakeholders.
7. To develop the mandate, strategies and management practices at universities for assessing, protecting and creating value from intellectual property based on new knowledge, services, products and technology generated at the university.
8. To select five Nicaraguans to pursue Master degrees in Sweden and to deliver the Chalmers Course in Idea Evaluation and Feasibility studies on site in Nicaragua for CNU and relate stakeholders, in order to develop local competence in IP and Intellectual Capital Management.

Table 8.1 shows the IUP budget as presented by Sida (2006) for total cost of 8 million SEK, allocated over three years.

One project output worked to "identify problems hindering research collaboration between industry and university in Nicaragua; to find means to better link, utilize, and enhance value of research at Nicaraguan universities to the industry where it better can appropriate value". Based on interviews with representatives from both industry and universities in 2009, they concluded that "local companies have little knowledge or understandings of what the Nicaraguan universities have to offer, while universities in their turn know very little about industry and the needs of research it has. Factual quality of the universities appears to play a secondary role after the perceived impressions, which in turn are often rooted in historical or uncertain examples".[88] This is similar to the findings of

[88] Johansson, M., Löwstedt, M. and Frank R. Melander, F.R. (2009), *How to Enhance Value of Research Results. University-Industry Collaboration in Nicaragua,*

Table 8.1. Innovative University Program in Nicaragua (total budget in SEK)

	Nicaragua	Nicaragua – administered by Swedish counterpart	Swedish counterpart
Workshops	150,000		
Printed material		30,000	45,000
Communication		70,000	70,000
Visits of the Nicaraguan project leaders (benchmarking international visits)	150,000		
International consultants	144,000		
Travel (international)	144,000		1,293,000
Travel (local), including accommodation	304,000		40,000
Per diem	36,000		180,000
Final conference	100,000		50,000
Local assistant	140,000		
Fees and overhead			2,556,000
M.Sc. training at Chalmers		2,500,000	
TOTAL	**1,024,000**	**2,600,000**	**4,234,000**

Source: Sida 2006 (exhibit 2b).

several previous studies on challenges to universities in Nicaragua to promote innovation. Other challenges include scarce financial resources within the universities that hamper research programs, leading to difficulties in bridging the gap between an early research output into a market ready product, "something found worldwide but especially troublesome in Nicaragua due to rather weak governmental funding possibilities."[89] As with the scoping report, it concluded that there is considerably more research activity and capabilities in Nicaragua but the diffusion of their products, learning and know-how is rather limited. Local companies tend to acquire technology from external sources. The reasons include: lack of research

Master of Science Thesis in Management and Economics of Innovations. Chalmers University of Technology. Göteborg, Sweden, 2009, p. 5.

89 Ibid. It is worth emphasizing here that for the portfolio being studied and especially in the case of BioEARN, that these are a group of generic and common challenges for converting research outputs to innovations globally, which are further accentuated in poor countries due to the greater lack of national funds, the structure of the economy and weaker linkages, discussed in the theory chapter in volume I.

culture, limited resources and lack of financing for innovations and for entrepreneurs, inadequate innovation processes, lack of knowledge about intellectual property, and the poor links between university and industry.

The IUP response to the identified challenges was an action learning program, where the participants were given a wide exposure, experience and practice in many key models, concepts and methods needed to support innovation and innovative behaviour. The project activities aimed at strengthening Nicaraguan universities to engage in partnerships with key stakeholders. It did not include activities that focused directly on the economic agents or on the support and policy structures, but the program worked to define roles of the different actors in innovations systems, to link the University with industry, to let the industry know more about the research potential that exists at the universities and to create alliances between deferent key sectors in the innovation systems.

ACTIVITIES AND OUTPUTS OF THE IUP

Annex I provides a comprehensive list of activities that CNU and its member universities carried out during the project along lines each of the eight objectives described earlier.[90] A notable positive feature of the activities undertaken is the emphasis placed on three monthly reports of progress on each activity and sub-goal, as well as a mid-term review of the activities in each of the eight objectives by each University. Below is a summary review.

- First, the introduction of concepts and a conceptual framework to understand and promote innovation in the universities, to allow the introduction of several reforms at the Universities to advance in the objectives: (1) transforming the roles and responsibilities of the CNU and the universities, and (4) developing functions, processes and structures for innovation.
- Second, the integration of fragmented activities in order to strengthen the extension role of universities and collaboration between them, to allow progress on (2) creating policies and strategies needed to include innovation in universities' mission and practices, (3) improving the research management process, and (5) developing the role and career of the researcher.

[90] The Annual Progress Report, 2009, submitted in August 18, 2010, includes an extra objective: "To create a platform, policies (laws) and alliances in Nicaragua to strengthen the national and local innovation system and the Intellectual property regime."

- Third, the consolidation of a platform of dialogue between the university and the private sector, which refers to the objectives (6) creating an atmosphere and culture that promotes sharing and learning with other stakeholders, and (7) creating ways to interact with other stakeholders and protect their knowledge through intellectual property of knowledge, services, products and technologies generated.
- Fourth, the support of five master students to create capacities in intellectual property, corresponding to the objective (8).

Introduction of concepts and a conceptual framework to understand and promote innovation: A critical component of the IUP has been the organization of consultation/dissemination mechanisms, such as workshops with multiple stakeholders, training sessions with national and international experts, meetings with several stakeholders to disseminate the results of the program and workshops, and preparation of printed material.[91] This group of activities has been the core of the program and has also contributed to build a network of collaboration between universities and professionals.

Among the outreach activities - "six workshops were organized and delivered to the key stakeholders in the Nicaraguan innovation system – on how innovative universities could be organized and structured and how they should work with their key partners like government, industry, finance, media"; high level meetings with national authorities to gather political support, as well with representatives from the financial sector, industries, and media. One activity consistently mentioned in the interviews was the benchmarking trip, where several representatives of Nicaraguan universities were able to visit Costa Rica and Panama. The objective of the trip was learning about the experience of relatively more advanced countries on the organization of their innovation and cluster systems. The results were also disseminated in a press conference and interviews to the local media.

One characteristic of the IUP in Nicaragua is that Sida's support goes to a consortium of universities. Therefore, one important component was strengthening the management and administrative capabilities of the CNU. This also had the advantage of

[91] Annual Progress Report (January to December 2010) as of 15 October 2010. Narrative report based on programs/projects result matrix with its expected results (impact, outcome and outputs) and quantitative and qualitative indicators. See Annex 1 for a list of these activities.

concentrating financial resources through a mechanism (CNU) that has the mandate to distribute public funds among universities (6 % of public sector income). The CNU platform has also provided opportunities for benchmarking and knowledge transfer, since representatives of universities frequently meet to monitor progress of joint projects and initiatives.

Integration of fragmented activities into a single objective of strengthening the extension role of the university and collaboration between universities: Universities have been carrying out several initiatives about intellectual property, support for student internships in private sector companies, offices of technological transfer, dissemination of available supply of value-added services, social work, extension of research and direct support of SMEs, and clusters through specific projects funded by international cooperation and public funding. The IUP has contributed to give coherence to this group of activities under the framework of "innovation". Moreover, it has promoted the creation of Offices of Technological Transfer, and measures aimed at improving student internships and greater participation in local firms, organizing resources within universities to improve research activities, among others.

Many activities that were being implemented in individual tracks were seen to be more integrated with the university authorities, making an effort to streamline activities by modifying internal legislation to provide better support. For example, each university was required to commit to a series of clauses in a contract to monitor their progress towards reforming the institutional structures according to their own priorities. This progress has been measured periodically in progress reports by each university (see annex 2). Another important example is the organization of support for student internships and all the different efforts to connect students with labor markets. This is probably one of the areas where the concept of innovation has been most influencial, in CNU universities.

One important output has been the publication of a book that describes more than 40 innovation projects in the universities, carried out during the last five years.[92] These innovative projects have been systematized with the collaboration of the ten universities and published by the CNU. Some of these innovations are in the fields of: (i) biology, like pest bio-controls and provision of small labs for

[92] Alemán, F, Medrano, H., Norgren, A. Reyes, A. and Scheinberg, S. (eds), 2010, Innovaciones en las Universidades Nicaraguenses: Casos exitosos, CNU-Sida-CIP.

education purposes; (ii) agriculture, like systematization of best practices and support to a banana cluster by the International School of Agriculture and Livestock (EIAG in Spanish); (iii) information technologies and education, like a video game to teach mathematics to children; (iv) research projects in topics such as anthropology, health and resource management; and (v) developing of methodologies and best practices, like strategies for water management, proposal of activities for rural extension, and education and program improvements.

A preferred platform of dialogue between the private sector, universities and the public sector: When asked about relevant platforms where the universities and other key stakeholders of an innovation system converge and dialogue about their interest, most interviewees indicated that other dialogue platforms have promoted dialogue between the private and public sector but never included the academia. The CNU has promoted these dialogues by organization of meetings, workshops and the dissemination activities described above. Therefore, universities and the CNU now participate in other dialogues promoted by multilateral development banks to improve competitiveness,[93] particularly one supported by the Inter-American Development Bank. Moreover, each university has been required to meet with their stakeholders on a regular basis in order to develop a research agenda with the input of their various customers and interest groups.

One area where these dialogues have converged is on the topic of intellectual property. In this case, there have been several activities to provide training about intellectual property (seminars, workshops and the completion of five master degrees by students on this topic); and the implementation of these policies within the universities. One of the main outcomes is a final assessment of the current practices in each university, but as the individual mid-term reviews indicate the progress has been different at each University with regards to the development of new norms, policies and their implementation.

Support of master degrees for students interested in the management of intellectual property policies: Related to the previous point, five students have been granted the financing to pursue a master degree in IP topics in

[93] Ms. Regina Lacayo, current representative of the Nicaraguan Chamber of Commerce (CACONIC) and former program officer for the IADB Competitiveness initiative, indicated that the IUP platform and CNU universities are now continuously working in projects where CACONIC is also participating.

the Intellectual Capital Management (ICM) at the Chalmers School of Entrepreneurship (CSE). The progress report (2010) indicate that universities developed a process to select the students, and now there are five students pursuing this degree – two of them had already completed their degree as of October 2010. In addition, Chalmers organized an Idea Evaluation course, where 45 participants received training about intellectual property and identified potential ideas within the research institutes and faculties.

OUTCOMES

The evaluation team has put its emphasis on the outcomes generated by these activities. The "objective of the field visit and the survey was to determine how, with whom and with what results, the program worked with the different actors in the innovations systems, linked the University with industry, and created alliances and transferred technology (…) The objective is not towards a verification of specific activities, or their individual quality. The key issue of the evaluation is whether across the projects, where there are observed "impacts" on research use; and, what lessons can be learnt."[94] The field investigations would confirm the following outcomes,[95] summarized below and then explained further:

The IUP has contributed to achieve a common language and appropriation of the main concepts it has been promoting such as innovation, entrepreneurship, improving services to address private sector needs;

The IUP, although gradually and not homogenously among universities, public institutions and the private sector, has brought changes in current institutional structures in order to provide a better environment that could increase innovation, entrepreneurship and research collaboration;

The IUP has contributed to provide a common framework to better align the research interests between universities and industries, but these linkages require further support to get consolidated.

The last progress report stated that there now exists a draft law for science and technology and innovation completed and presented

[94] Email to the project coordinator for planning the field work.

[95] As the project was still in the final months of completion at the time of the visit, these have to be referred to as short term outcomes and not impacts. Impacts in terms of increased knowledge inputs to production and firms, of collaborations, problem solving, and economic changes can only be judged appropriately over the coming years.

to the parliament, by an expert group supporting the National Council of Science and Technology (CONICYT).

A potential outcome from a working group of the CNU and ten universities trained on intellectual property and innovation is an ongoing process of developing policies on intellectual property, on innovation and for research.

A common language and appropriation of the main IUP concepts by universities: This singular achievement was highlighted by Dr. Freddy Aleman in the first briefing by telephone when planning the visits. This then became a working hypothesis that has been fully checked out in the field. Concepts such as promoting innovation and entrepreneurship, improving services to address private sector needs, streamlining student internships, intellectual property, responding to private sector and market needs, strengthening productive clusters and conglomerates, and the Triple Helix model, have become established in the language of universities. During the meetings and interviews, although the problem of different "cultures" between the private sector and the universities was often mentioned, not a single person indicated that there were opposite or clashing views between the actors, but indicated in fact that there were complementary roles and mentioned the potential impact of the concepts. This is an achievement given the particular context at the universities before the IUP, where most universities were more focused on research rather than extension services.

Subsequent changes in institutional structures support the view that *CNU universities are willing to include these concepts in their internal normative.*[96] This was one of the objectives of the IUP project, but given the universities' autonomy, transforming their internal legislation was a prerogative of each university. Although gradually and not homogenously among universities, they have been adapting their normative to introduce innovative concepts. The case of UPOLI, a private university in Managua, is worth highlighting. Under the

[96] See Annex 2 for a list of monitoring documents that contains the initiatives to transform their internal legislation taken by CNU universities. In particular, each university presented a mid-term review of their progress at the end of 2009. From these documents it is clear that, most universities, with different degree of progress, are in the process of changing key pieces of internal normative to facilitate providing services to the private sector: intellectual property normative, procurement, creation of an office of technology transfer, management of research, resource allocation and roles of students, professors, research institutes, among other.

leadership of the Vice-Rector Dr. Lydia Ruth Zamora, a team of eight people in UPOLI has introduced concepts from the IUP in their internal functions. For example, it has established an office of technological transfer, introduced various courses on entrepreneurship and management skills to their students, established a competition fund to support student's business initiatives, and an advisory service office to provide technical assistance to students, among other initiatives. Although other universities have engaged in similar initiatives, the pace of change and the organization of a like-minded management team at the university constitute a particularly good practice.

A common framework to better align the research interests between universities and industries: Despite the progress at promoting dialogue and establishing a common framework of understanding between the three actors of the Triple Helix, university research is still not perceived as entirely relevant for the two other actors' activities, particularly the productive sector. As indicated, most of the research at Nicaraguan Universities responds to the interest of the researcher, for example, students and young researchers pursuing a research degree or professors engaging in their own research projects. However, the support to SMEs has become a priority in all universities. In this regard, a joint initiative by the Council of Science and Technology (CONICYT) and the CNU universities – also supported by Sida – has made an comprehensive inventory of the type of services that each university (at the level of faculty schools and research institutes) are able to provide to the productive sector. Each university was guided to meet with their stakeholders on a regular basis to develop a research agenda, with the input of their various customers and interest groups.

IUP has been an opportunity for universities to integrate their own faculties' capacities. One question of the complementary survey indicates that most of the perceived impacts of the IUP have occurred within universities, their professor and faculties, and to a lesser extent the perceived benefits have been outside the scope of universities. This is consistent with consultation carried out in the field: IUP has permitted the integration of several institutional, normative and research initiatives under a common framework. According to table 2 (including only valid responses), most of the perceived impacts captured by responses to our complementary survey indicate that the most visible impacts have occurred at the university level (joint projects with other faculties and professors) but not necessarily influencing policy

makers or economic agents. It was reported by Chalmers that the Universities in the CNU went from no collaboration before to teaching each other about research methods, entrepreneurship, IP, and learnt to share information (documents, policies, ideas), experience and contacts. Although this impact cannot be assessed quantitatively, the judgment arrived at is that universities appear to have increased capacity to utilize their research activities more effectively and generate synergies. There was frequent mention during the discussions that "nowadays universities have to adapt to the demands of other actors outside the university", which constitutes a change that can integrate outside demands with interests inside the universities. The table below provides an indication of the views of some of the participants from the universities on the outcomes of the project on their instituions, but given the small number of responses it does not have quantitative value.

Table 8.2. Based on your own experience, do you think, the project has helped to:

	Null	Modest	Good	Excellent
Increase knowledge inputs to production and firms	1	0	1	2
Improved capacity of universities to collaborate/ initiate problem solving/R&D projects	0	0	0	4
Increased cooperation within University	0	0	0	4
Increased cooperation between professors	3	1	2	1
Changed/influenced direction of research?	0	0	3	1
Changed/influenced direction of teaching?	2	1	0	2
Increased dissemination of results to policy makers	1	0	1	2
Increased involvement of students in support to cluster	2	0	0	1
Influenced student training and perspective	2	0	0	1

Notes: There were 15 respondents for Nicaragua. This table does not include the 6 who did not answer the questions and 2 who responded "do not know". Source: Electronic survey.

An important goal of the project was strengthening collaborative research between universities. This is a work in progress with a perception that universities could improve their working together,

though there are important examples and a recognition that this has improved compared to previous years. For example, there is evidence that the network of universities is helping them to work together in several areas. Some areas of improvement are: raising awareness about the importance of creating synergies and promoting collaboration; joint participation and organization of academic events and workshops; technical cooperation between universities in their area of expertise; and increasing sharing of experiences, contacts and opportunities. However, these joint projects are still perceived as fragmented and infrequent. The reasons for this are: competition for funding, similar research capabilities among universities, small size of many projects that do not justify increased partnerships, lack of harmonization of administrative procedures to engage in joint projects (procurement, hiring), and lack of incentives to do so, among others.

Consolidating research capacities at universities has been a first step in a series of reforms needed to strengthen their linkages with the private sector. Universities have been focusing entirely on producing research in the form of publications and generation of knowledge. But the number of research papers produced is not an end in itself, and one of the impacts of IUP has been making it clear that modern universities need to engage more consistently with the demands of the private sector, the market and communities. Although it has been difficult for Nicaraguan Universities to interact with the biggest companies in the sector they engage – although there are also several cases where these companies are starting to look with interest these initiatives by providing sponsorship to specific activities – there is a consensus that universities are finding a balance between their development and research role. By focusing on vulnerable sectors, such as SMEs, it will be possible to optimize their services and provide support to SMEs activities. There is evidence that this has been happening in other vulnerable sectors such as indigenous knowledge: "the research aims to find successful ways and methods that the university can work and create relationships with indigenous communities that can result in mutual benefits. The aim is that the indigenous community can benefit by getting support in finding value in their traditional products so that they can find additional income (even commercial success) for their community."[97]

[97] Scheinberg, S., Norgren, A., Perera, F. and Alänge, S., 2009, *The Role of the University in Protecting and Creating Value from Indigenous Knowledge*,presented at GLOBELICS 2009, 7th International Conference,, Dakar, Senegal, 6–8 October 2009, p. 1.

The field visit was also an opportunity to appreciate whether universities are adequately targeting their research and extension activities to satisfy existing demand. A majority of the interviewees believed that the primary target for the universities' extension role should be medium and small companies (SMEs). But this raises an important dilemma for the universities and the researchers. On the one hand, there is a critical mass of researchers trained in top-notch research in their specific areas of expertise, but they lack adequate resources to further their research in Nicaraguan universities. Potential users of this knowledge are often large and medium-sized companies, which are few in Nicaragua, and those that exist are more interested in acquiring knowledge and technology abroad; or transnational enterprises, that tend to operate with their own technologies.

On the other hand, there is a heterogeneous mass of SMEs with low levels of capitalization, income and savings that usually require low-cost technology applications and also need to improve administrative, legal and routine productive processes. This dilemma between different demands is especially acute in the case of public universities, whose mandate to support vulnerable populations is very strong, in the national political and social context. Providing value-added services directed to the larger and more sophisticated firms could potentially be profitable and self-sustainable in the future, but providing these services to the smaller firms would probably require subsidies. There is some evidence that this is happening, such as in the case of quality certifications for the food industry.[98]

In our field visit, we focused on three aspects of the context that have shaped the IUP initiatitive: (i) what are the main characteristics of the linkages between universities with markets and the private sector; (ii) how universities are using their improved research capacities to strength their extension role; and (iii) what are some of the main barriers to improve the universities' extension role.

Linkages to markets: When asked whether universities have linkages to markets in order to provide services to the private sector, there were two types of answers from our interviewees. First, they indicate that universities have not been responsive to the opportunities that

[98] One difficulty is that most universities do not have adequate policies for the use of their laboratories in the case of certifications, so services are usually made on a case-by-case basis. Ms. Callejas, CEO of a food business company, indicates that sometimes universities still do not have established rates and fees for these services.

markets provide to improve research and mobilize additional financial resources, to put value to the knowledge generated in the university, to increase the number of ventures, and to disseminate knowledge and technologies. This has certainly been one of the main ideas behind the IUP. Second, there was another group that argued that the linkages between universities and the markets has worked well in the case of the "market for development projects and related consultancies". In these cases universities staff have been able to stand out due to the level of their research and the supporting research institutes. These research institutes – and frequently professors individually – compete for funding from the "market" provided by foundations, international cooperation and public funds; and sometimes private companies. Here they show evidence that they are receptive to market needs and have the capacity to adapt to changing contexts and demands. It was also accepted that even in the second case, there is a mismatch between the types of research that universities usually conduct, and the types of demands that development projects and consultancies make on them.

Critical mass of researchers in universities and its extension role: The idea that there exists relevant research and solid research capabilities within universities, but the private sector have little knowledge of the type of services that universities can provide was very common when explaining the weak linkages between universities, industries and other actors. Nevertheless, further analysis and comments point out the fact that several incentives are not aligned to improve the pertinence of the universities' research (from the private sector point of view). First, except in the case of the few research institutes with scientific personnel dedicated entirely to research, all other academics in the universities have to divide their time between research, teaching, management of their own projects, dissemination of their findings and fundraising.[99] Second, students applying to a degree are responsible in part of the research production in universities, through their thesis and projects. In the opinion of some professors interviewed, most research is made to obtain a degree and the likelihood that students will continue this research is rather low. Third, not all universities have fully implemented their Offices of Techno-

[99] Question 19 of the electronic survey "the greatest difficulty you faced in making contributions were due to" reasons such as lack of time, administrative issues or lack of financing, the few respondents (4) strongly indicated that "lack of time" was the main reason they could not contribute more with the program.

logical Transfer (OTT) to help researchers to disseminate and offer their services. A fourth reason is the nature of demand discussed earlier. In their opinion, there are few funds and demands for ventures and technological transfer.[100]

Attention to the particular context in Nicaragua and universities is key for their extension role: The political and social context was a topic that according to the respondents has had critical influence during the implementation of the IUP. Ideology, lack of financial instruments and expertise, different interests, and even the lack of trust in capitalism and the private sector are elements that are perceived to be at the root of a mutual distrust between universities and other actors, particularly from the private sector. However, these barriers have clearly receded in the opinion of interviewees. Still, there is a perception among some of our interviewees from the private sector that universities are not easily willing to change at the required pace to become innovative. Another key contextual element is the fact that the private sector is very stratified. It is composed of a small number of large firms and a myriad of non-integrated small and medium firms with low-productivity. Therefore, an important number of respondents indicated that the main target of the universities' extension role should be to primarily support medium and small companies (SMEs).

CONCLUSIONS AND RECOMMENDATIONS

The main findings of our field visit, conducted during the last week of November 2010, are consistent with most of the findings that previous assessments about the situation of science, technology and innovation in universities in Nicaragua (see context and the IUP response). In addition, it was possible to find evidence of the impact of the IUP regarding research collaboration and how the ideas disseminated by the program are permeating and contributing to transform institutional structures; better ways of interacting with other stakeholders; and attitudes of researchers, university authorities, public institutions, and the private sector, to concepts such as innovation, entrepreneurship and research collaboration, among others. These findings are also consistent with the issues brought up in a previous assessment of the risks of the IUP idea (Sida 2006):

[100] Agora Partnerships, an investment mechanism with the support of international cooperation and multilateral development banks, provides support for entrepreneur's business plans. See www.agorapartnerships.org

"It is difficult to foresee the effectiveness of the transfer mechanisms and the impact of this program. It may take different forms at the universities and need different time span to be realized. The universities may also have difficulties to employ staff at the technology transfer units due to lack of financial resources. The program also aims at changing the image of university, which now to a large extent is considered as a closed entity by the Nicaraguan industry. There has been political conflicts regarding the position of the public universities in society, therefore, the political situation in the country may influence the possibilities to change this image." This statement describes part of the difficulties and challenges that the IUP has faced to achieve its goals.

There have been several issues of project design that could have been different. This action-learning program was designed to be completed during a period of 2.5 years but it required almost four years to be completed. This leads to the observation that at a minimum the time required for the initiative was underestimated. Another issue is the focus of all activities remaining on CNU and the Universities. While accepting that the work required to transform the Universities was likely to have required more efforts than provided for, the larger question in design is whether there could or should have been more parallel activities as listed in the 2005 report and they could have involved other stakeholders more directly and that the budget allocations would have been recast. The authors of the assessment at Sida were both involved in the approvals and management of the ISCP-EA. Yet, they accepted as a fact the view of the CNU which proposed "another type of approach than the one undertaken in Eastern Africa". This underlines a tension for Sida staff, as to the degree to which Sida should or should not intervene in redesigning the proposal submitted by national partners.

The difficulties of translating research to innovation in a short time, is illustrated below. The 2004 TCI conference papers by UNA[101] describes their own innovations, and the concept of "innovations" as used is instructive. UNA listed the rapid multiplication techniques for Taro, plantain and bananas; (Green house techniques); In vitro propagation – pineapple, cocoyam, taro, plantain and banana through the supply of healthy plant material; and the use and management of landraces for animal feeding as innovations. But then went on to add that the "research outputs were not com-

[101] Presentation by Universidad Nacional Agraria (UNA) in TCI conference, in Ottawa in 2004.

mercialized", because "the technology was for small farmers, for small industry; the role of the University was to generate the technology, but not to commercialize, while farmers organizations or private sector should take care of commercial production". Even though there was "huge demand... but not possibilities of commercial development" because of the limited "mission" of the University, the lack of financial support and because the agriculture cluster is not organized. Similarly, and again, in the new project output in 2010 listing University innovations there is an impressive and large numbers of important research outputs of the ten Universities, but the report does not actually indicate any cases where the bottlenecks between research and innovation have been overcome. Similarly, the new output in 2010, lists a large number of important research outputs of the ten Universities, but does not indicate any cases where these bottlenecks have been overcome. The question has to be raised as to whether the project could have achieved additional measurable outcomes that resulted in increased economic benefits being realized through a different perhaps wider focus on ensuring greater exchanges between stakeholders through efforts at improving actual use beyond strengthening the CNU and the group of Universities.

The overall conclusion is that universities are better prepared to become "innovative universities", as was the goal. But full impacts take time and for universities to translate the improved institutional environment to promote stronger links, and to support innovations. A number of initiatives are mentioned in the book "Innovaciones en las Universidades Nicaragüenses", but they are still fragmented. The potential and initiative from faculties, professors and scientist to improve these outcomes are noteworthy but there remain many other limitations due to structural problems, such as the lack of financial resources for research and innovation, the weakness and low productivity of the SME sector, and the still limited engagement of larger companies, as discussed. Finally, as the project was still in the final months of completion at the time of the visit, the impacts in terms of increased value to economic agents – knowledge inputs to production and firms, collaborations, problem solving, and economic changes can only be judged more appropriately over the coming years. Hence it would be important for the partners to see if there could be annual reviews after the completion to see how the new capabilities developed unfold to produce the desired impacts.

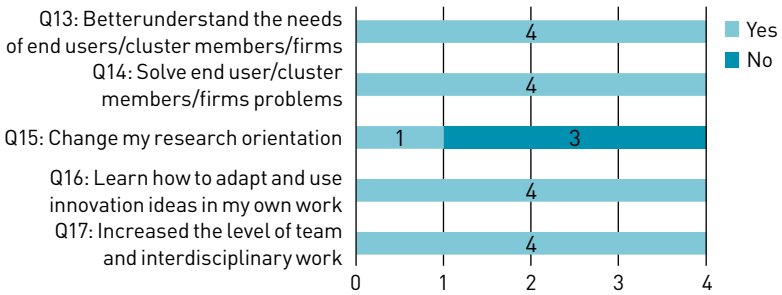
THE SURVEY

The electronic survey was sent in Spanish on Nov. 30, 2010 to a list of 37 email addresses provided by the project coordinator and the survey was closed on Dec. 20, 2010. In spite of five reminders, (on 6, 9, 13, 15, 17 December), only fifteen people answered the questionnaire when it was closed on 20 December. Ten of the responses are from universities, two from government entities and three from NGOs. From the ten from universities, only four said that they had contact with IUP-Nicaragua and only these four completed the survey. Only one of the two from government entities completed the survey. There were no respondents from other research institutes, firms, financial institutions, unions or business associations. That resulted in only 8 useful responses. All eight have participated in workshops and training to increase their capacity to transfer knowledge. Also, only person from University and one from a NGO were involved in project management, providing training to others to transfer knowledge, on creating networks, links and alliances within the university or on creating networks, links and alliances with other universities and research organizations. The numbers of respondents are too small to provide confidence in quantitative values but the responses provide additional support to the qualitative findings from the field interviews.

OUTCOMES – THE UNIVERSITY

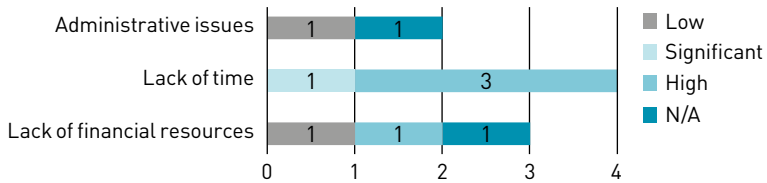
The four useful responses from the universities indicate that getting involved in the IUP-Nicaragua project helped them to better understand the needs and to solve problems of end users, and firms. People from this group of respondents started to understand new concepts and methodologies, learn new tools for interpretation of users needs and translate them to projects and programs, helped researchers to do a better analysis and interpretation of data, and started to work directly with users in their production areas with the capacity they get from the program. Beside, all of them learnt how to adapt and use innovation ideas in their own work and increase the level of team and interdisciplinary work. One of the surveyed said "one innovative idea was the need to improve the coverage of the project, idea or proposal, in order to submit them in an attractive way to the user; this concept could be adapted to any area of my work in management of R&D". Only one of the surveyed also says that it made him/her change his/her research orientation. (See Figure 8.1)

Figure 8.1: Be involved helps me to improve my own capacity in:



Most said that challenges were a lack of time, financial and human resource with lack of time as the highest difficulty they had to face. (See figure 8.2)

Figure 8.2: Q19: The greatest difficulty you faced in making contributions were due to:



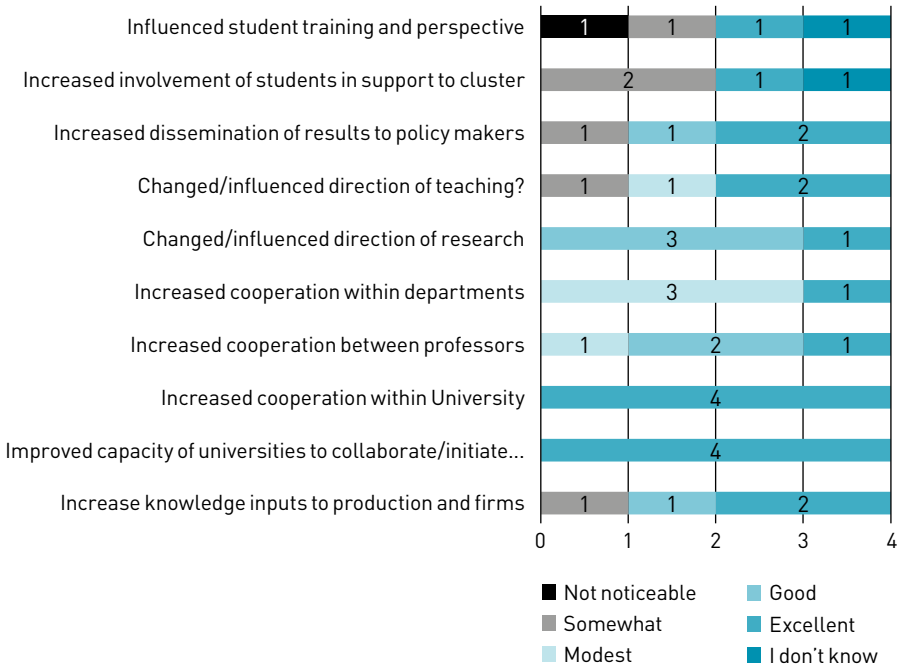
All of the four think that the project helped in an excellent way to improve the capacity of universities to collaborate/initiate problem solving/R&D projects, increase cooperation within university, and increase cooperation between professors. In other areas there were not a consensus. (See figure 8.3)

They suggested that the organization of the project could be improved with more knowledge on innovation, training for human resources an building a network between the ten universities of CNU. Some of the achievements listed are: submitting proposals for the design of an intellectual property policy, for building networks, and for technological services for laboratory quality. Additionally, they thought adding entrepreneurship and innovation as new issues in three academic programs would help.

SURVEYED FROM THE GOVERNMENT

One person from government responded and she considered that the IUP-Nicaragua helped her to better understand the needs of end users and firms, in particular to understand better the innovation system inside enterprises and universities. Also, it changed her

Figure 8.3: Q20: Based on your own experience, do you think, the project has helped to:



Note: The numbers show respondents who answer the questions.

thinking about required policy support towards to the implementation of policies and rules that improve and foster innovation in the country. Besides, she learned how to adapt and use innovation ideas in her own work, through the implementation of new process of monitoring and implementation. She thinks that her capacity and role could have been more effective if there were processes that allowed the institution where she works to link all the sectors that work with the innovation system and if they had access to financial resources to foster activities on these matters. Lack of financial resources and time, as well as administrative issues are the most significant difficulties.

However, for her the project helped in an excellent way to increase knowledge inputs to production and firms, to change/influenced direction of policy design, and to increased dissemination of results to policy makers. Also, it has been a good help to improve capacity of universities to collaborate/initiate problem solving/ R&D projects, to increase cooperation within government organization, to increase cooperation between policy makers, and to increase

involvement of government functionaries in support to cluster and influenced government functionaries training and perspective. Besides, the National Plan of Science, Technology and Innovation, the proposal of the law for Science, Technology and Innovation, and a better link between sectors are some examples of achievements considered by the surveyed. Also, she proposes that better knowledge and technology transfer is a way that the organization project could be improved.

NGOs

All three respondents participated in workshops and training to increase their capacity to support productive enterprises and one out of the three respondents has worked on creating networks, links and alliances with the University, firms, research institutes, governments and other organizations. They didn't answer the rest of the questions.

FACILITATOR EXPERIENCES

Even though this was not a focus of this project, one person completed this section. He participated in the cluster *Plátano en Rivas*, Nicaragua, that was not a part of the project. He did not receive any training as a facilitator. He used his capacity very well to build trust, linkage within and across clusters and linkage with the university. He helped to access to market, finance, and inputs, as well as creating linkage with government. He rated his role in improving cluster performance as very high in most categories.

ANNEX 1. LIST OF PIU ACTIVITIES 2007–2010 BY PROJECT OBJECTIVES

1. To develop the roles and responsibilities the CNU and the Universities have in the current and future innovation system in Nicaragua in partnership with the other stakeholders in Nicaragua.
   a. To create a platform, policies (laws) and alliances in Nicaragua to strengthen the national and local innovation system and the Intellectual property regime.
      i. Clear goals and an action plan were developed for creating a national agenda for Innovation and science and technology (planning documents)

   ii. A process was explored, developed and defined for how to develop a new law and policy for Nicaragua for innovation and science and technology (planning documents)
   iii. A team of experts, authorities, law makers and civil society were identified (expert lists)

b. Creation of innovation networks
   i. Creation of a leading advisory board (with representatives from Industry, Government, Financial sector, Associations, Media, NGO, Unions and municipalities) which provide stakeholder perspectives and feedback to the CNU on the Innovative University Program, and to create joint learning opportunities (advisory board list).
   ii. UNA and UNI support the creation of networks on entrepreneurship, with participation of Universities and actors that take part in the program (list of participants in networks).

c. CNU development
   i. Six meetings with Rector team to support them in redefining their roles and responsibilities as leaders in the innovation system representing the CNU (presentations and notes from meetings). Rectors of CNU Universities received feedback of the finding of the program, and were continuously made aware of the importance of the goals of the program and how important it was for them to support their team, and be active in engaging in the IUP.
   ii. A process of integration of science, technology and innovation into the agenda of each University (examples of mission, visions).
   iii. Innovative University program integrated into the majority of the CNU universities strategic and operating plans (examples of annual operative plans).
   iv. Ten meetings with the CNU Research council to review program strategies, results, plans – to get their inputs, improvement ideas and commitments. In addition – to develop the research council leadership team (agenda and meeting notes).

d. Training and competence development
   i. Six workshops were organized and delivered to the key stakeholders in the Nicaraguan innovation system – on how innovative universities could be organized and structured and how they should work with their key partners in,

eg: government, industry, finance, media, etc. – see Goal 7 for more details.

ii. Created special training sessions for the key members of the innovation system in Nicaragua – eg: organized by the leaders of Conicyt and COSEP, inviting their members as well as government agencies, private universities, private SME, etc.

e. Special activities for and with Government
   i. Four meetings with the Vice President of Nicaragua – to present the IUP – updates of results achieved and to plan cooperation needs for future activities (agenda and meeting notes).
   ii. Twelve meetings with Conicyt directors – to get to know each other, review past and upcoming activities and identify areas for cooperation (agenda and meeting notes).
   iii. Ministry of Economy – National Patent office (RPI) (agenda and meeting notes)
      1. Six meetings with Mific RPI office – to support them in redefining their roles and responsibilities in supporting the Universities in developing their IP policies and practices.
      2. Support to RPI to define and develop a new strategy for how to create products and services and an approach to support society and market awareness of IP issues.
      3. Support to RPI to develop training materials and approaches to support CNU development of IP policies and practices.
   iv. Trained the leaders of INPYME for their strategic development (agenda and notes)
f. Special activities and Links to industry
   i. The CNU-COSEP forum was developed and conducted to explore the links and potential cooperation between the two sectors and partners (link to webpage, documentation and presentations from the round tables, summary of results).
   ii. Training of CADIN leaders and member companies on Geographical indications and appellations of origin (presentations).
   iii. Conafruve and APEN leader participated in IUP workshops and advisory board meetings
g. Special activities and links to financial sector

i. Ten meetings with Agora Partnerships leader to explore and develop the cooperation between CNU and Agora (meeting notes).
ii. Agora leader trained the IUP participants in venture capital and programs they are offering (presentation).
iii. Three meetings with the leader of the government agency Fondo Credito Rural (rural credit fund) to explore opportunities for cooperation and work on advisory board (meeting notes).

h. Special activities and Links to Media and general diffusion of results
   i. Met with the key editor of the leading newspaper (La Prensa) to discuss their editorial policy for reporting on innovation, science and technology (meeting notes).
   ii. Three press conferences to inform representatives from the various media organisations on the accomplishments of the IUP (press releases and meeting notes, pictures).
   iii. Diffusion of the program both internal in CNU and in the public media
      1. Radio interviews with leadership team – eg: after each workshop a radio interview was conducted (links to coverage).
      2. TV coverage after Benchmarking trip (link to coverage)
      3. Print media (articles)
         a. Freddy interviewed for La Prensa (3) and Nuevo Diario
         b. Andreas interviewed in Nuevo Diario (1)
      4. University publications of IUP (articles)
         a. Bulletins, scientific journals
      5. Webpage of many CNU universities – review (links to webpages)
      6. Local TV channel – eg: in Rivas
   iv. Presentation of IUP at conferences, seminars, etc. (presentations)
      1. Globelics – India 2007
      2. Globelics – Senegal 2009
      3. CIP Forum – Gothenburg 2007, 2009
         a. International conference on IP and Innovation – chaired by Chalmers and Göteborg University. Presenting the IUP experience, with the conference Innovation Systems in Developing Countries – fol-

lowing a humanistic approach. CIP Forum – 6 September 2009,
    b. Sari Scheinberg – Chalmers Industrial Technologies (CIT), Andreas Norgren – Chalmers Industrial Technologies (CIT), Sverker Alänge – Chalmers University of Technology, Freddy Aleman – National University Council (CNU), Nicaragua
  4. Congress on Science and Technology – Bolivia – October 2009
  5. PILA – EU Program – Colombia – November 2009
 v. Publication of books, articles, etc.

l. Innovation cases from the Universities identified, documented and shared with the others
  i. A visit to Nicaragua typically lasted for 2 weeks. A normal 2 week period included meetings and work with the various stakeholders in the innovation system
  ii. 3 day workshop for CNU and stakeholder group
  iii. CNU – follow up at each university. Analyzing work done and planning for next steps
  iv. Rectors – Development Day
  v. Research council meeting. To review IU program in general and specifically: role of the researcher, research inventory and data base and masters program
  vi. Conicyt – Advising the National Council for the Innovation, S&T Law and policy creation
  vii. MIFIC RPI – mission and strategy for diffusing MIFIC competence in Nicaragua
  viii. Advisory Council – input from innovation system stakeholders. Press conference
  ix. Training in Conicyt or Cosep seminar.

2. To create the policies (research, IP, innovation and entrepreneurship) needed for how the university aims to include innovation in its mission and practices
  a. Identification and invitation to leading experts around the world to train the IUP participants in IP and innovation policy development (training materials and presentations)
    i. Mats Lundqvist – Sweden
    ii. Karen Hersey – USA
    iii. Diannette Gallardo – Panama

   iv. Beatriz Garcia – Cuba
   v. Jamie Hardy – USA
b. Each university prioritized the polices to work with
c. IUP Workshops to support the CNU leaders on the development of IP policies for each university (training materials)
   i. Staff from the ten Universities (over sixty teacher-researchers) trained on
      1. Purpose of Innovation and IP policies
      2. Contents and structure of the IP policy document
      3. Stages of Development of the IP policy – what it takes and who is involved and how long is needed
      4. Examples – of various types of IP policies
d. Action learning process on how the policy, practices, resources, organization forms and processes are in place or needed for making the research results more visible (presentations).
e. Analysis of the existing practices and policies each University has in terms of Research, Innovation and Intellectual Property (assessment document).
f. Development of CNU university policies
   i. Redefinition and improvement of Research policies (examples collected)
   ii. Development of a draft for IP and Innovation policies (examples collected)
   iii. Identification of the process for creating, approving and implementing the policies (notes from meetings with University leadership team)

3. To assess and improve the research management process, including the plans, designs, methods, relationship building and management practices that will support the applicability and integration of the research activities and results into society.
   a. Assessment of the research management process
      i. Identification of good examples of research to market process in each University in order to have cases to learn from in the CNU Universities (good examples).
      ii. Assessment of methods for collecting research activities at each university and how they present their research results internally and externally.
      iii. Assessment of current research design and management practices in each university.

iv. Assessment of the policy, practices, resources, organisation forms and processes in place or needed for making the research results more visible in the university and more available for the society for each CNU university.
v. Identification of training needs for researchers and supervisors of student research projects.

b. Improvement of universities research management processes
   i. Introduction of the issue of research visibility and the necessity of having systems and data bases that support the collection and diffusion of the research activities (presentation).
   ii. Evaluation and development of the curriculum for research methodology training (in each university) – to ensure that the 'research to market' perspective is included.
   iii. Assessment and development of the curriculum and determined how to upgrade the entrepreneurial or innovative skills of the teachers and students.
   iv. Improvement and development of new research systems (documents, norms and regulations) to include IP management and innovation and technology transfer perspectives.

c. Training and competence development
   i. IUP workshops dedicated to introducing models, methods and structures needed to develop research to market strategy and practice (training materials).
   ii. Universities are sharing experiences and training each other in research management (training dates and materials used, participants).

d. Develop links to customers
   i. Developed process for supporting universities to define customer needs (training materials).
   ii. Development concept, process and results – in creation of university research agenda (research agendas).
   iii. Identification of the various ways and possibilities of integrating the stakeholders and customers into research process (training materials, actual examples).

e. Improve research visibility
   i. Started an inventory of the research activities and products developed at each University in order to identified good practices or products that could be commercialized (research data bases).

ii. At least five Universities have developed a data base for research, technology transference and post graduated studies in order to let know society about this activities.

f. Book for University innovation cases

i. Universities have developed a process to select Innovation cases that has been successfully in reaching society.

4. To develop functions and processes and structures in the University that will support how an innovative and entrepreneurial orientation will be integrated into its vision and practice, particularly in the 'research to market' process.
   a. Training and development of CNU on Technology transfer office (TTO) (training materials and presentations)
      i. Universities and stakeholder group have been trained and made aware of the need to have a TT function, the processes and competences needed to drive this function.
      ii. Universities given a package of documents, contracts, norms and regulations for IP and innovation and technology that were used as 'best practices' (at MIT) which were all translated into Spanish.
   b. An assessment of the current practices of technology transfer and extension at the CNU universities (meeting notes)
      i. Assessment how research and extension units at the Universities are linked and whether or not a new unit dedicated to TT is needed.
      ii. Assessment of the curriculum to determine what kind of training exists and what needs to be improved to support the university's transformation to be more innovative.
      iii. Assessment of the current practices regarding Research and Extension at the universities.
         1. Awareness training in innovation and IP for researchers, teachers, etc.
         2. Search and documentation processes for value identification
         3. Evaluation of commercial, legal, market, etc viability
   c. TTO vision and strategy developed and communicated
      i. Workshop (materials and presentations)
   d. Core TTO activities are reviewed and some are integrated into existing Roles and responsibilities of research and extension directors.

i. Examples of function or process that University has developed to transfer products of research.

5. To further develop the role and career of the researcher and the contracts and incentives needed ensure the continued development of this professional group from a research and innovation perspective.
   a. Conducted an assessment of the Researcher role and position in the university (notes from meetings)
   b. Incentive Programs developed in CNU to give some rewards to researchers who are producing results (documents, money allocated in budget)
   c. Competitive funds are now available to support research activity in CNU universities (UNA, Unan Managua, Unan Leon and UNI, – examples)
   d. Integrate research approach, methods and studies – into the curriculum
      i. Training on how to write research proposals, how to apply for money, how to write scientific papers (training materials)

6. To develop an atmosphere and culture in the university (and CNU/Advisory Council) that encourages more transparency, sharing and learning, by developing a more systematic and conscious way of working, reflecting and sharing.
   a. University Leadership support and commitment to IUP
      i. Meetings with rector group to establish commitment (meeting notes)
      ii. Meetings with the research council to establish cooperation and commitment (meeting notes)
      iii. University leaders meet regularly with the IUP driving teams (notes from meetings)
   b. IUP driving team in each university has authority and strategy to lead IUP
      i. Teams have both oral and written (operating plan) mandate and authority to lead University transformation to become more innovative.
      ii. Driving teams meet continuously with the IUP leading team to get support, feedback and direction (meeting notes).

c. Quality management, continuous reflection, evaluation and improvement
   i. Ongoing assessments – weekly, every 3 months, annually
   ii. IUP midterm evaluation – evaluation of the results achieved in the program till February 2009, at the same time, and reflection on the results achieved, success, failures, mistakes, and what can be learned and improved to set priorities for the time that remain for the program. With the midterm evaluation it was possible to identify resources needed to succeed and create an action plan linked to the operation plan at each university.
d. Assessment of current work practices and management routines
   i. Training of the IUP participants in process thinking and mapping (see maps from training).
   ii. In the IUP workshop – conducted action learning training and assessment of current work practice and way of managing routines (training materials and presentations).
   iii. Evaluation of working style, groups working process and university routines for working and reportingn(training materials and presentations).
e. Training & application of Cycle of experience to support systematic approach to work and research
   i. Becoming more conscious and systematic in way of working and managing work.
   ii. The Cycle of experience concept, model, methods taught to IUP stakeholders.
      1. In IUP workshops, in Conicyt seminars (training materials and presentations).
   iii. IUP participants apply the COE in their respective organisations – (examples) eg:
      1. To plan, lead and assess meetings
      2. To design research projects
      3. To assess the research to market process
      4. More consciousness in how work is being conducted (more reflection, feedback)
f. Continuous assessment of culture and work processes (agenda, questions and notes from follow-up meetings at each CNU university, mid term analysis, final analysis)
g. Increased sharing and diffusion of knowledge and work – internally and externally

i. Universities share experiences and good practices to let the other learn.
   1. IP Policy development (examples Uraccan and Uni with other CNU)
   2. Every IUP workshop integrates time and demand on the CNU to present their way of working and approaches and results achieved (see workshop goals and flow, university presentations)
   3. University system for science, technology and innovation (UNA – to others)

ii. Universities teaching each other and sharing methodology
   1. Research methodology (Unan Leon to Bicu and EIAG Rivas)
   2. Entrepreneurship training (Uni to the others)

h. Sustainability of teams, work and results achieved
   i. A visit of each of the ten CNU universities was done in order to have a final assessment of results and experiences, integration plan for processes, activities, etc., definition of roles and responsibilities.

7. To develop competence and strategies for protecting and creating value from intellectual property based on new knowledge and technology generated in the university.
   a. An assessment of the current practices of IP in each University.
      i. Each university conduct assessment of their IP policies, practices and management.
      ii. Each University presented their status of policies at workshop in November.
      iii. Leading team from the universities received feedback on their IP policy, norms and regulations.
      iv. leading teams learn about aims of the process and methodology for conducting an innovation and IP assessment/ audit.
   b. Training and development of key personnel in management of IP functions and value creation models – IUP workshops and key themes (for a detailed description of workshops 1–4, benchmarking trip and On Site workshop – please see previous annual reports):

i. Workshop 1 (July 2007) – innovative university concepts, world trends, innovation, cycle of experience (systematic way of working)
ii. Workshop 2 (November 2007)– university policy for research, IP, innovation, entrepreneurship, theories on relationship building in order to create Strategic alliances and relationship building.
iii. Workshop 3 (February 2008)– innovation systems, Chilean experience in building innovation systems, problem solving methodology
iv. Workshop 4 (May 2008)– technology transfer function, competence, processes – the USA experience, process mapping, Evaluation of current successful and not so successful relationships in key strategic alliances, and how the industry sees and uses strategic alliances with the university
v. Benchmarking trip (July 2008) to Costa Rica and Panama
vi. On site workshop (Nov 2008) –
vii. Workshop 5 (Feb 2009) IP and Innovation policy, Strategic alliances, Presentations from leaders of Nicaraguan industry and Presentation of cases.
viii. Workshop 6 (July 2009) Integration and sustainability, status review on key IUP activities and goals (IP policy, innovation case book, innovation system network, sustainability and integration – what will support and hinder) planning for next year, presentation of the new Chalmers course, local innovation stakeholders presenting and process mapping.
    1. On site visit to each university (final assessment of results and experiences, integration plan for processes, activities, etc., definition of roles and responsibilities, formal closure with each university).
    2. Meeting with the various stakeholder groups
ix. Ministry of economy (MIFIC), RPI office developed a program and approach and trained the CNU universities (leadership, researchers, teachers, etc.) in IP.

c. Identify good examples of value creation from research, extension and education
    i. Started a process and identified criteria to select successful innovation cases from each CNU university
    ii. The design and format for University Innovation Case book was developed

iii. Editorial teams created and a process developed for feedback and improvement of each case
iv. Cases were documented and written
v. Feedback was given to each author for improvement

d. Entrepreneurship training
   i. Assessment of CNU universities of existing entrepreneurship training
   ii. Various models of entrepreneurship training presented in IUP workshop
   iii. At least 5 of the CNU university developed their own approach to offer entrepreneurship training
      1. UNI, UNA, BICU, UPOLI, UCA

8. To select 5 persons for Masters Education in order to develop local competence in IP and Intellectual Capital Management and to deliver a Chalmers course on Idea Evaluation in Nicaragua.
   a. Chalmers Master Candidates
      i. Chalmers team developed marketing material to diffuse the offer for CNU and other universities in Nicaragua
      ii. Chalmers team presented offer
         1. In IUP workshops to diffuse the scholarships among the University Communities.
         2. In specific information meetings in various open meetings for CNU (located at UCA; UNI and UAM)
         3. In the research council
      iii. Each university conducted their own marketing – in house
      iv. Continuous evaluation and improvement of methods and approaches for the diffusion and marketing of the offer.
      v. Chalmers team offered extensive support to students interested on taking the master
      vi. Final results
         1. Number of students applied to Chalmers
         2. Number moved to the 2nd stage
      vii. 5 candidates were accepted into the Chalmers Business Design Masters program

Period	Intellectual Capital Management (ICM)	Chalmers School of Entrepreneurship (CSE)
2008–2010	Lucia Alvarado	Daniel Alvarado Roberto Mena
2009–2011	—	Ricardo Amador Cesar Porras

b. Chalmers Course on Idea Evaluation developed and approved
    i. CNU Universities developed a process to select five persons for Masters Education at Chalmers University to develop local competence in IP and Intellectual Capital Management, unfortunately they do no succeed. As a result Chalmers team create idea to offer an in situ training in Idea evaluation and Feasibility studies that will be carried out in the first semester of 2010.
    ii. Chalmers team met with CSE course leaders in Sweden to adapt current program (course PM) for Nicaraguan conditions and demands (meeting notes)
    iii. Chalmers team presented course concept and research council for feedback and eventual approval
    iv. Criteria developed for who from IUP program participants and an extended group – should be trained

Annual target – Expected impact, outcome and outputs for January to December 2010

1. Redefining the role and responsibility of the universities in Nicaraguan society
    a. Development of National Laws and Policies for science and technology
        i. Draft law and policy for science and technology and innovation should be completed and presented to the parliament
        ii. Expert team working as a good support for Conicyt
    b. Innovation stakeholder groups should continue to work and learn together
        i. To create the conditions needed for improving the relations and cooperation to support a more dynamic and productive innovation system
2. Policies and strategies for innovation, IP and entrepreneurship developed for the CNU Universities
    a. Continued development of IP policies
    b. Conduct a status assessment on what policies have been created and what still need to be developed

3. To assess and improve the research management process, including the plans, designs, methods, relationship building and management practices that will support the applicability and integration of the research activities and results into society

   a. Develop links to customers
      i. To continue to work with building relationships with the university stakeholders to support:
         1. To keep in touch with their change of needs and conditions
         2. Development of the research agendas
         3. To invite them into the research process
      ii. Improve research visibility
      iii. To continue to support the remaining five Universities to develop a data base for research, technology transference and post graduate studies in order to let know society about this activities.
   b. Book for University innovation cases
      i. To support the Universities to develop their cases – by selecting and using an editorial board
      ii. To publish 1000 copies of this book

4. To develop functions and processes and structures in the University that will support how an innovative and entrepreneurial orientation will be integrated into its vision and practice, particularly in the 'research to market' process.
   a. CNU-Chalmers Team offered continuous support to the driving teams inside each university to continue their work in establishing the processes needed for supporting innovation and Technology transfer

5. To further develop the role and career of the researcher and the contracts and incentives needed ensure the continued development of this professional group from a research and innovation perspective.
6. To develop an atmosphere and culture in the university (and CNU/Advisory Council) that encourages more transparency, sharing and learning, by developing a more systematic and conscious way of working, reflecting and sharing.
   a. University Leadership support and commitment to IUP
      i. To continue to meet and support the rector group – evaluation and improvement of their role and responsibility in the IUP
      ii. To continue meeting with the research council to establish cooperation and commitment

iii. To continue to support and follow up with the University driving leaders

b. Quality management, continuous reflection, evaluation and improvement
   i. To continue to conduct continuous assessments – weekly, every 3 months, annually
   ii. To conduct a Final evaluation of the IUP program
   iii. To continue to use the COE as a holistic and organizing model for working and evaluating

c. Increased sharing and diffusion of knowledge and work – internally and externally
   i. To continue to support the Universities to share experiences and good practices
      1. The Chalmers Idea Evaluation course will be a forum for this exchange
   ii. Universities to continue teaching each other and sharing methodology

d. To develop and lead a Final workshop – for IUP program – (July 2010)
   i. To gather all IUP participants for final review of results achieved and celebration
   ii. To hold a Press conference
   iii. To get presentations from each team – on key results achieved during the 3 year program
   iv. To develop and present a Final evaluation – to assess the key results a chieved in the IUP

v. To conduct a Final ceremony – awards and certificates

7. To develop competence and strategies for protecting and creating value from intellectual property based on new knowledge and technology generated in the university
   a. To conduct a final assessment of the current practices of IP in each University.

8. To select 5 persons for Masters Education in order to develop local competence in IP and Intellectual Capital Management and to deliver a Chalmers course on Idea Evaluation in Nicaragua. (goal adjusted in 2009)
   a. Current 5 Chalmers Master Candidates supported
   b. To develop and deliver the Chalmers – Idea Evaluation Course (January – July 2010)

i. Finalization of the program goals and methods – to support universities develop competence, systems, methods and processes for supporting a sustainable way to evaluate the potential value – that research results and ideas have – for society and for the university.
ii. To develop the curricula and adapt it to Nicaragua conditions
iii. To select participants – approximately 45 participants from the Nicaraguan innovation system – from among:10 CNU universities, MIFIC RPI, Agora, INTA, COSEP, Conicyt
iv. To support the delivery of introductory module in IP – by Mific RPI (February 2010)
v. To deliver 3 training modules – by Chalmers team (March, May, June 2010)
vi. To develop and follow up on homework assignments

9. Key activities leading to the diffusion and sustainability of this program
   a. National conference – celebrating the Innovative University Program of Nicaragua (July 2010)
      i. To define the Key goals in a clear way
         1. To share the results, reflections and experiences of the IUP
         2. To gather the key actors to generate ideas and strategies and plan for the future of innovation in Nicaragua
         3. To diffuse the work done and achievement of IUP that can lead to the creation of new relations, idea and priorities that support innovation activities needed to develop Nicaraguan society
      ii. To develop the methods, design and program for the conference
      iii. To identify key speakers to invite
      iv. To identify key participants to invite – beyond the leading teams
      v. To identify and plan for the venue and logistics for conference
      vi. To lead an excellent and productive conference
      vii. To publish a CD with all of the presentations from the conference
   b. To diffuse the results and experience of the IUP (2010)
      i. On TV – To promote the IUP conference

ii. On radio – To promote the IUP conference
iii. In print To promote the IUP – press release and Press conference
iv. Webpages – in each university

c. Sustainability
   i. Plan to sustain research activities (UNA to others) 2010
   ii. Final conference – round tables focus – future of innovation
   iii. After each workshop – each university is visited by the CNU and CIT leading team
   iv. Between each workshop the university works on their prioritized areas, the CNU team calls and visits each university and the CIT teams calls and writes to each university
   v. Documentation, all work is continuously documented by CNU and CIT and every 3 months – an analysis and summary of results and experiences is conducted
   vi. Continuous follow up and support to Conicyt, MIFIC RPI, CNU
d. Publications planned:
   i. Publication of University Innovation Case book (September 2010)
      1. To conduct editing review and give feedback to the authors
      2. To improve cases – in content, structure and pictures
      3. To work with book publisher to negotiate agreement and price
      4. To publish 1000 copies of the book
   ii. Publication of the Innovative University Program book (December 2010)
      1. To gather the chapters from each university on their experiences, results and reflection from participating the IUP
      2. To write up the first section of the book – reviewing the goals, model, methods, philosophy of the IUP program
      3. To produce a draft for CNU reviewers to review and give feedback
      4. Print 500 copies – in English and Spanish
e. Participation in national and international conferences and seminars:
   i. University 2010 – The future of universities in Latin America – Cuba – February 2010 – Freddy Aleman – presenter

ii. Exit Nicaragua – the closing of ASDI's 30 year work in Nicaragua –
    1. April 2010 – in Nicaragua – Freddy Aleman – Poster session
    2. May 2010 – in Stockholm – Sari and Andreas – Poster session

Other planned activities:

(E.g. visits, human resource development)

1. CNU-Chalmers leadership team – to meet and evaluate and reflect on the results achieved in the IUP in order to
    - Develop the final report for 2010
    - To develop strategies for Phase 2 – to sustain and further develop the IUP

ANNEX 2. REFERENCES

Documents of CNU-CIT Program of Entrepreunerial University

1. Alemán, F., Programa: Universidad Emprendedora. Julio 2007 – Diciembre 2009. UNA.
2. CNU – CIT. Programa la Universidad Emprendedora en Nicaragua 2007–2009. Evaluación y Análisis de la mitad del PUE. Julio – Noviembre 2008. BICU.
3. CNU – CIT. Programa la Universidad Emprendedora en Nicaragua 2007–2009. Evaluación y Análisis de la mitad del PUE. Julio – Noviembre 2008. EIAG.
4. CNU – CIT. Programa la Universidad Emprendedora en Nicaragua 2007–2009. Evaluación y Análisis de la mitad del PUE. Julio – Noviembre 2008. UCA-2 Octubre 2008, Preliminar.
5. CNU – CIT. Programa la Universidad Emprendedora en Nicaragua 2007–2009. Evaluación y Análisis de la mitad del PUE. Julio – Noviembre 2008. UCATSE.
6. CNU – CIT. Programa la Universidad Emprendedora en Nicaragua 2007–2009. Evaluación y Análisis de la mitad del PUE. Julio – Noviembre 2008. Universidad Nacional Autóma de Nicaragua, Le (UNAN-Le).
7. CNU – CIT. Programa la Universidad Emprendedora en Nicaragua 2007–2009. Evaluación y Análisis de la mitad del PUE. Julio – Noviembre 2008. UNAN Managua.
8. CNU – CIT. Programa la Universidad Emprendedora en Nicaragua 2007–2009. Evaluación y Análisis de la mitad del PUE.

Julio – Noviembre 2008. Universidad Nacional de Ingeniería (UNI).
9. CNU – CIT. Programa la Universidad Emprendedora en Nicaragua 2007–2009. Evaluación y Análisis de la mitad del PUE. Julio – Noviembre 2008. Universidad Polit nica de Nicaragua.
10. CNU – CIT. Programa la Universidad Emprendedora en Nicaragua 2007–2009. Evaluación y Análisis de la mitad del PUE. Julio – Noviembre 2008. URACCAN.
11. CNU – CIT. Programa la Universidad Emprendedora en Nicaragua 2007–2009. Evaluación y Análisis de la mitad del PUE. Julio – Noviembre 2008. UNA
12. Scheinberg, S. & A. Norgren. Workshop 5. Results of the Mid term analysis. Innovative University Program. CNU – CIT.
13. Summary of mid term analysis results – to be presented in Workshop 5.

Monitoring documents

14. Annual Progress Report (January to December 2010) as of 15 October 2010. Narrative report based on programs/projects result matrix with its expected results (impact, outcome and outputs) and quantitative and qualitative indicators.
15. Annual Progress Report (2009). Narrative report based on programs/projects result matrix with its expected results (impact, outcome and outputs) and quantitative and qualitative indicators.
16. Research Cooperation with Nicaragua. Report February 29, 2008 to January 15, 2009.
17. A Review of the Results achieved in The Innovative University in Nicaragua. July to December 2007.
18. Summary of key results achieved – Innovating University Program. November 2007 to December 2007.
19. Summary of key results achieved – Innovating University Program. January to March 2008.
20. Summary of key results achieved – Innovating University Program. April to June 2008.
21. Summary of key results achieved – Innovating University Program. August 2008 – April 2009.
22. Summary of key results achieved – Innovating University Program. May 2009 – August 2009.

Additional documents and publications

23. Alemán, F., H. Medrano, A. Nargren, A. Reyes y S. Scheinberg editores, (2010), Innovaciones en las universidades nicaraguenses, CNU-Sida-CIP
24. Alange, S., and S. Scheinberg, (2005a), Innovation Systems in Latin America, Sida, 95 pages in printed version.
25. Alange, S. and S. Scheinberg, (2005b), Innovation Systems in Latin America. The electronic version has the presentations made at the TCI conference that provide almost 90 pages of additional details on the three countries)
26. Alange, S. and S. Scheinberg (2005). Innovation systems: Examples from Honduras, Nicaragua and Bolivia.
26. Boeren, A., T. Alberts, T. Alveteg, E. Thustrup and L. Trojer, (2006), Sida/SAREC Bilateral research cooperation: Lessons learned, Sida Evaluation 06/17
27. Johansson, M., L. Martin and F. Melander, (2009), How to Enhance Value of Research Results. University-Industry Collaboration in Nicaragua, Master of Science Thesis in Management and Economics of Innovations. Chalmers University of Technology. Goteborg, Sweden, 2009.
28. Scheniberg, S., A. Norgren, F. Perera, and S. Alänge, (2009), Role of the University in Protecting and Creating Value from Indigenous Knowledge. 6–8 October 2009
29. Sida, (2006), Support for development of innovation systems and innovative clusters un low-income countries, Information & Assessment memo 5 December 2006 by SAREC
30. The Council of Nicaraguan Universities (CNU) and Chalmers University of Technology (CIP) (2006), Proposal for: The Entrepreneurial University Program in Nicaragua. 31 August 2006.

ANNEX 3. AGENDA IN NICARAGUA

Fecha	Hora	Entrevista con
Martes 23-11-2010	01:00–05:00	Vista UNAN León, Dr. Leonardo Mendoza y Ana Isabel Gutiérrez
Miércoles 24-11-2010	10:00–12:00	Ing. Alexis Arguello Centeno (MIFIC) Job Valladares Erick Zúñiga
	01:00–03:00	Lissette María Cuadra Castillo (AGORA)
	03:00–05:00	Guadalupe Martínez CONICYT
Jueves 25-11-2010	08:00–10:00	Lic. Regina Lacayo Oyanguren (CACONIC)
	01:00–03:00	UCA (Dr. Jorge Huete, Rogerio Medina, Wendy Belanger, Carlos Vallejos, etc.
	04:00–05:00	Dra. María Auxiliadora Briones (FUNICA) Danilo Saavedra
Viernes 26-11-2010	08:00–12:00	Grupo focal – Consejo de Investigación del CNU ampliado (Mario López, Norma Corea, Henry Pedroza, María de Jesús Cárdenas
	01:00–03:00	Vista a UNA (Ing. Telémaco Talavera, Freddy Alemán, Sandra Lovo.
	04:00–05:00	Dra. Lydia Ruth Zamora UPOLI

9 BIO-EARN and Bio-Innovate

BIO-EARN

BACKGROUND[102]

Phases I and II

In 1998, Sida/SAREC started a large pioneering program to build capacity in the relatively new and emerging area of biotechnology, in four partner countries in Eastern Africa (Ethiopia, Kenya, Tanzania, and Uganda), called BIO-EARN[103]. The objectives were to (i) enable the countries to develop biotechnologies and policies according to their needs, abilities, and opportunities; (ii) promote collaboration among the stakeholders in the same areas to address key challenges and opportunities; and (iii) to foster communication between scientists, policymakers, biosafety regulatory officials and private sector, nationally and regionally.

Initially, in 1997, the Stockholm Environmental Institute (SEI) was assigned the task of formulating the proposal in consultation with regional research and development organizations. The BIO-EARN programme was launched in March 1999, with a first phase to 2001, funded with SEK 39 million. There was a Phase II from 2002–2005, funded with SEK 56 million. Both phases were coordinated by the SEI and the four countries had a national BIO-EARN focal point at the Science and Technology Commissions for Ethiopia and Tanzania; and, the National Council for Science and Technology, in Kenya and Uganda.[104] The first two phases, from 1999 to 2005, focused on capacity building. While Phase I concentrated on networking and individual capacity building, Phase II added

[102] This is prepared by Amitav Rath based on documents listed and interviews.

[103] The East African Regional Programme and Research Network for Biotechnology, Biosafety and Biotechnology Policy Development. BIO-EARN maintains its own web site at – http://www.bio-earn.org, which is an excellent source for information on the programme and has been used in this review. The total Sida contribution for three phases of BIO-EARN during 1998–2009 is 172 million SEK.

[104] Each of these four organizations are responsible for national policies and coordination of STI activities though there are naturally differences in their individual mandates.

emphasis on institutional capacity, infrastructure and policy development.

The value creation lay in knowledge creation through research, several capacity building training workshops, improved infrastructure in the R&D institutions, and, collaboration among 15 Eastern African R&D and policy institutions. Over the period BIO-EARN program created and nurtured an extensive network, of 35 research and policy organizations from the four countries and from Sweden.[105]

Among the outputs achieved, noted in several assessments and reports[106], are the successful Ph.D. training of 20 persons in agricultural, environmental, and industrial biotechnology, through the well established "sandwich programs" developed by Sida in partnerships with Swedish institutions for higher education and research, coordinated by SEI. It led to collaborations in "technology development" and technology transfer partnerships in research, development, and policy institutions. The Program raised awareness on key biotechnology policy issues in the region and it was said, thus act as a regional "think tank." It facilitated the development of biosafety regulatory structures and capacity, including biosafety assessment. It was hoped that it would stimulate the dialogue between the policymakers and scientists on research and policy issues, both nationally and regionally, thereby contribute to a more effective priority-setting, technology development, and technology dissemination. The Sida assessment concluded that "As a result the partner countries and the BIO-EARN network institutions in particular, are now better able to make use of and work towards overcoming the challenges of modern biotechnology and biosafety".

The 2004 evaluation, supported the assessment of the achievements, and said that BIO-EARN, through its action-oriented approach to selecting partners, focus areas, and projects by operating at senior research level rather than at the institutional and government levels, could achieve a rapid start-up. It added "*there was a lack of emphasis on multidisciplinary research program, a* lack *from a student-training perspective, but also from the perspective of implementing research*

[105] Ibid; and contact details of the main Network Partners, 42 individuals and 35 organizations are on its web site.

[106] The key documents that provide assessments and summaries of the outputs and outcomes of the first two phases begin with the evaluation document, Morris, E. Jane and Niels. P. Louwaars, Sida Evaluation 04/09; Abeli, W. S. 2006; Mukiama, B.et al. 2006, BIO-EARN Programme Proposal to Sida (2006–2009); and the BioInnovate proposal document.

results". Furthermore, the evaluators *wanted "clearer links and more synergy between different aspects"* of the program. In its support for the third phase, the evaluation also called for a new governance structure to incorporate regional ownership. It also called for greater emphasis on multidisciplinary "R4D" (research for development), combining policy and biotechnology research.

BIO-EARN Phase III (2006–2009)

SAREC sent out the phase III program proposal for peer review by five external experts; together they studied the development of BIO-EARN and noted the program accomplishments, which had included extensive lists of workshops and of publications, an impact assessment, and a 2004 Evaluation of BIO-EARN. All of this preparatory work suggests an excellent information and analytical base, a good basis for the assessment of the future priorities and outcomes, and SAREC recommended the third phase.

Phase III was supported for SEK 77 million over the period 2006–2009. The coordination moving to the region, at the IUCEA. The Eastern African network partners were said to be responsible for the management of the Program, with a new management structure having a Governing Body, a Program Advisory Committee, Regional Office, and the Implementing Institutions. The Program was coordinated through a BIO-EARN Regional Office, with SAREC, moved to the Inter University Council of East Africa (IUCEA) as the earlier arrangement was not satisfactory.[107]The role of SEI was limited, and restricted to providing specified services as an advisor to the secretariat and to the policy project. A new 14 member Governing Body (GB) was constituted, with representatives that included the four heads of the Science and Technology Councils/Commissions, several representatives of relevant government line ministries and heads of universities and ministries, the Secretary of IUCEA, the Executive Director of NEPAD and a representative from Sida. The role of the GB was to oversee and make decisions on the general direction of the Programme and ensure integration and harmonization with national activities; changes that were to increase

[107] PROMEMORIA, SAREC, 7 October 2005, Gity Behravan, Ref. numbex 2004–000,515 explained this as "Regrettably, UNCST and the regional coordination office have not been able to serve the programme as efficiently as was expected. The reasons are many and include institutional problems at UNCST involving heavy involvement of coordinating staff in other activities". IUCEA also hosted and managed the Lake Victoria Research (VicRes), supported by Sida and so synergies between them were also hoped for.

the local ownership. A Program Advisory Committee provided technical inputs to the Program, evaluated the project proposals, and, advised the Governing Body and Regional Coordination office. In order to "improve research outputs" the programme focused on five research projects (summarized below) for an allocation of SEK 52.6 million. Projects 1–4 were developed in a competitive fashion[108] selected from 24 concept notes received and with an external review. The fifth, was policy oriented and four national Science and Technology Councils/Commissions helped prepare that proposal.

Agricultural biotechnology studies on specific biotic and abiotic stress problems in sorghum, cassava, and sweet potato;

Industrial and environmental biotechnology studies to treat and utilize industrial and agricultural waste for bio-energy and value-added chemical production;

Functional institutional and national biosafety regulatory systems with a focus on harmonizing regional biosafety implementation;

Strengthening a Network of Excellence to respond effectively to strategic development challenges of the region; and encouraged Scientific Conferences such as one in Uganda in 2008, that brought together research stakeholders to share and appreciate contribution of research findings, and to chart a bio-resource agenda for the future, with over 153 participants[109] representing all countries, and different actors in the innovation system.

Enhancing product development opportunities and supportive policies – this was a platform for communication and information exchange between the regional consortia and stakeholders; to include dialogues at high government level in order to review and communicate research results, jointly identify constraints and opportunities to technology development and diffusion, as well as ways to move research forward. Activities will focus on identifying and addressing regional and national biotechnology and bio-safety policy issues and research management challenges with particularly emphasis on addressing strategic issues related to Product Development Partnerships and Public-Private Collaboration.

[108] Even though the selection was competitive, BIO-EARN graduates played a leading role in all four selected research proposals. Source: Enclosure 3, p. 1–7, A brief presentation of the proposed BIO-EARN programme during 2006–2009.

[109] June 2009 BIO-EARN newsletter A Publication from the BIO-EARN Regional Co-ordination Office Issue No.5, June 2008 – June 2009.

It was stated, in the third phase, that there was a shift in the focus from capacity building to "research for use", for policy formulation and collaboration, and it also included a new allocation called the "Innovation Fund", because it provided a "Research for development (R4D)" platform and infrastructure that could "contribute to improved livelihoods and environment and reduce poverty".[110] At the same time, the approval memo also called it a "minor fund" that would support strategic demonstration projects, policy research and integrative research across the programme.[111] Later it added, that this was a "competitive research fund" that will serve to integrate the research, the development and dissemination of industrial agricultural biotechnology. And then, the main focus of the "Innovation Fund" would be to support quality biotechnology research, policy and technology dissemination and demonstration projects. This fund provided support to four additional regional projects (similar to the first four) with the expectation of *outputs that could be used,* – the reduction of abiotic and biotic stresses of sorghum; cassava and sweet potato production for food and industrial use – where marker-assisted selection (MAS), and faster breeding process would guarantee a timely and robust response to threats to production process, genetic improvement and clean seed production would contribute to food security and economic development; technologies for treatment of high strength agro-industry wastewater – with slaughterhouse and tannery effluents, where new tools, and products (bioprocesses) will enhance the performance of waste water ago-industry management practices; and, technologies to utilize industrial and agricultural waste for bio-energy and value-added chemical production to be developed using surplus biomass generated from sisal and fish industries. Sida allocated 76 % of the budget for the five research projects,

[110] BIO-EARN Programme, Innovation Fund Proposal, Regional Coordinators of BIO-EARN Programme, November 2006. This stated that the Fund would be to support projects that have generated research outputs with potential *commercial value* where the fund would support product development – proof of concept, small and large scale pilot testing, scaling up the production of the product and setting up demonstration plots/pilot plants. Commercialization could also be supported where appropriate. The proposals may be spin -off from the previous and current BIO-EARN projects, but new proposal from outside the current BIO-EARN institutions will also be considered. In order to achieve impacts the fund was to grant few, but fairly large proposals, support strategic demonstration and technology dissemination projects, policy and integrative research across the program.

[111] Source: PROMEMORIA Department for Research Cooperation (SAREC) 7 October 2005 City Behravan Ref. Number 2004–000,515; p. 3 and 9.

13 % for programme management and finally, only 11 % to the "Competitive Research Fund".[112]

Phase III was to further strengthen the "network of excellence to respond effectively to strategic development challenges of the region; and harmonization of knowledge management, communication, and information to support efficiency and effectiveness of innovation systems in the sub-region".[113] It was to capitalize on the investments in education and training by value addition. Among the Expected Outcomes[114] were "potential products to improve the performance of the agriculture sector" and a communication, marketing and outreach strategy that could commercialize research outputs. The external reviewers commented that the plan was strong on capacity building but *it was unclear whether the required linkages for product development existed, could be developed and there was a need of market analysis.*[115]

RESULTS

The June 2009 BIO-EARN newsletter[116] gave a summary, which stated that – projects had been carefully designed to deliver concrete demand driven outputs/outcomes. It has consolidated its presence in the region as a dynamic, innovative and results oriented initiative. In the area of agriculture, tools with agronomic potential to enhance breeding and production of principal crops such as cassava, sorghum and sweet potato had been identified. With regard to environmental

[112] Ibid; p.12. We note here, that the use of the word minor, the regular interchange between the words research and innovation suggests that for Sida the difference between them was not well understood. Nor was it understood that even under the linear model for research to use, it is the subsequent activities after or beyond research – integration of knowledge, communication and technology dissemination and demonstration and scaling up of research products for different users, where appropriate, costs many times more than the outlay for research. The approval of the fund was hedged with concerns that more information on the scope, criteria, management, review and ownership was needed though it could be "instrumental in supporting the much needed technology transfer, entrepreneurship" and "the movement of interesting and promising technologies from the laboratory to the market". That led to the Innovation Fund Proposal to be developed in 2006.

[113] Rath, et al. 2006, "Support to International and Regional Thematic Research programs, 2000–2005: Individual reports and Cases", Sida

[114] As expressed in Mukiama, Titus K. et al. 2006, BIO-EARN Programme Proposal to Sida (2006–2009)

[115] Sida Assessment Enclosure 5, p.6 and 7.

[116] BIO-EARN newsletter – A Publication from the BIO-EARN Regional Co-ordination Office Issue No.5, June 2008 – June 2009.

health, value addition to agro-industrial wastes, efficient and sustainable technologies for bio-energy and treatment of high-strength waste water for environmental sustainability had been developed. It had significantly contributed towards strengthening the capacities of several partner institutions. Policies and Intellectual Property (IP) management systems had been developed. Opportunities for forging public-private partnerships explored and strengthened. It is anticipated that *with the various technologies, tools and products* arising from the various projects under implementation *being adopted*, the programme would greatly contribute to the region's food security and nutrition, environmental sustainability and poverty alleviation. It concluded that "BIO-EARN is without doubt, a successful initiative whose impact of outputs are systematically building up".

At the end of 2009, the following achievements have been noted by stakeholders[117]:

Eleven new PhDs, 33 MSc and two postdoc students were trained under the program, increasing the number of biotechnology scientists in the region. More than 80 scientific papers/publications, most of them peer reviewed were published and presented at scientific meetings.

Research capacities and competences in the region were improved to use biotechnology on key problems in Eastern Africa with 11 former students, from Phase I, directly involved in R&D projects and acting as effective research leaders.

Multiplication of human capacity building through researchers acquiring new research grants; improved regional and international collaboration enhanced and two PhD students promoted to management positions in their institution. New Curricula developed in molecular biology, biotechnology and bio-informatics, at four organizations.

Research infrastructure built in 17 laboratories in the region with two having attracted additional funding support for infrastructure development.

These capacities were being shared within the region with increased student exchange training programs at MSc and PhD levels, with increased networking, information sharing and communication. The network of researchers and research capabilities built allow timely response to current and future problems.

[117] As listed in Annex 3 (i): BIO-EARN Program Outputs and Outcomes (1999–2009), Sida Assessment document for Bio-Innovate, 2009 together with items from the BIO-EARN Newsletter, Issue No.5, June 2008 – June 2009.

On the goal of using biosciences to facilitate local breeding of improved planting material and improving agro processing opportunities the report states "two improved sorghum varieties became available"; "farmers will soon access sorghum varieties more tolerant to soils with high aluminium contents and sorghum varieties which more efficiently absorbs nutrients" and "potentially access sorghum varieties more resistant to the parasitic weed striga". The "breeding of sweet potato tolerant to sweet potato virus disease (SPVD) more precise and effective", the same was achieved for Cassava.[118]

The new proposal made for Bio-Innovate concluded that over a period of ten years (1999–2009), the BIO-EARN Programme has involved 35 institutions from Ethiopia, Kenya, Tanzania, Uganda and Sweden, more than 100 scientists and an even larger number of policy makers and practitioners from the region. It has served as a "regional network of excellence", as a platform for regional collaboration and information sharing, and has been effective in developing Eastern African capacity in biosciences, biotechnology policy and bio-safety assessment.[119]

OBSERVATIONS

We found no reason to differ with the above assessments. We found the overall quality of research, research outputs in terms of peer reviewed papers, the topics covered and the training in all the projects is commendable. Generally, the level of efficiency of projects implementation is satisfactory despite many constraints to the speed and quality of implementation discussed below. These are all outstanding achievements. They support well the discussion in the theory of innovation and growth, discussed in the main report, and which has been the basis for the Sida support, *that new science, technology and knowledge developed through areas such as biotechnologies, provide opportunities* for the region to develop their own versions of "science led economic growth"[120] and can assist in developing a stronger economy utilizing natural resources.

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[118] In Annex 3 (i): BIO-EARN Program Outputs and Outcomes (1999–2009).

[119] Leta, Seyoum. et al "Innovation Network for Eastern Africa Development (Bio-Innovate)," Program Proposal. The proposal also stated that the program "has also developed new products such as improved varieties of sorghum, cassava and sweet potatoes, new bioprocess technologies for waste water treatment and energy production".

[120] The emphasis made in the proposal document, for a "science led economic growth", which we have discussed is actually narrower than the innovation theory suggests.

The comments made here cannot be considered as an evaluation of this very large programme. They are deliberately listed as observations. The financial allocation for this single intervention is larger than the resources made available for all other cases in the portfolio studied in this evaluation, and was made over a long period. Full analysis of this one program, to the extent appropriate by its own size and importance, a program that lasted over one decade with investments over SEK 177 million, would overshadow in the other Sida interventions in the portfolio.

We have examined the final reported activities and outcomes compared to what was stated in the approval documents and the comments made here look at the activities and outcomes, through the innovation systems lenses that has been discussed in the main report. It is our view that there are a number of reasons why it would be important for Sida to undertake a separate study to better understand the lessons of BIO-EARN, and draw better lessons for Bio-Innovate and that forms one recommendation.

The research outputs and the human and infrastructure capacity building that have been achieved as outcomes are certainly very impressive. This is a very interesting project in that it address the real needs of the group of countries to catch up in this new area of technology. The literature confirms that applications of biotechnology can provide a very significant potential for economic growth in the countries involved, as is also anticipated in richer countries, with current higher capacities in the science and knowledge involved. The area of biotechnologies chosen for capacity building and supported by Sida is, in our view, totally relevant for the countries involved.

But there were also, as can be expected from the theory, major challenges to implementation and barriers to achieving all the goals that were set. Several key challenges are mentioned repeatedly in various self assessment reports and program documents.[121] They often refer to "common challenges and problems". Most common were delays of various kinds. Delays mentioned include – in the launching of the projects, in the signing of agreements, long registration procedures, difficult and bureaucratic national and university procurement systems. Within the research studies, there were difficulties to access research funds and research facilities, and, some-

[121] The same challenges were also mentioned in all interviews. It is noteworthy, that while most documents are congruent on the positive achievements, they are less coherent with regards to the challenges faced and whether they have been dealt with.

times non-functional team members and a lack project team motivation hindered progress. Beyond management and administrative issues note is made of additional challenges within the research undertaken, such as – the molecular studies took much longer than anticipated; there were needs for further validation of information generated. There were many statements that the estimate of outputs needed to be "more realistic" and beyond the research, "strategies for dissemination need to be developed"; and, use required "the establishment of an integrated pilot system" and "cost benefit analysis is crucial". Lack of support and capacity in procurement sometimes led to poor quality of purchased laboratory supplies and consumables, when finally available.

New inputs were provided by Sida to improve management and coordination. They included training on result-based management to project managers and researchers in 2008. There was regular M&E organised by the Regional Coordination Office (RCO).[122] There were many efforts made to link the research outputs with the private and productive sector. One MOU was signed with a private company on sisal, and with another to utilise improved planting materials through tissue culture. Similarly contacts were made with fish processing factories for research collaboration; some seed distribution companies were identified as partners; links were made with the seed clusters and with the Morogoro Food Processors cluster.[123] For the production of new fermented drinks (*togwa*, *obushera* and clear malted drinks) partnerships were made with SMEs, the economic feasibility was established and one start-up enterprise (Lisha Products Ltd) participated in entrepreneurship training, and developed a business plan. Pilot production of *obushera* was started using *improvised* equipment, with much delay as the pilot equipment ordered had not yet been supplied. Documents noted that many activities need to be undertaken in a given sequence, so one delay, cascades through with delays in all subsequent activities. The procurement process was often blamed as long, time consuming and insensitive to the rigorous needs of time bound projects. In an example provided in Nairobi, delays in procurement, the lack of capacity to procure technical equipment and supplies, the technical challenges in the filtration

[122] The newsletter reported on the M&E exercise undertaken in 2008, where a team visited all the regional participating institutions and selected field experiments and assessed both progress and limitations, working with the scientists and students.

[123] These are also cluster initiatives discussed in the Tanzania chapter.

process due to non- availability of appropriate filter membranes and lack of experience in forming partnerships with industry, caused delays in the production of clear malt drinks. The assessment concludes "Outcome/Impact thrusts on *use* is still low and yet to be achieved".[124] This is a point we wish to emphasize here, that the existing reports and interviews, suggest that there is as yet a lack of outcome and impact *in terms of use of this capacity* for economic purposes.[125]

It is useful here to step back and look at the assessment by Abeli of Phase II of BIO-EARN made for COSTECH, looking narrowly at results in Tanzania[126] through the summary below, before drawing conclusions. The report for COSTECH says, Tanzania has been integrating biotechnology into the country's research and development programmes, especially for agriculture, but mostly first generation applications in fermentation techniques in food, wine and beer production, and the second generation is the use of pure cells or tissue culture to produce/propagate new products. As there are only a few R&D institutions, which are struggling to reach more advanced levels, overall Tanzania is yet to exploit more recent advances in biotechnology. The application of biotechnology is required for the country, but such application requires the prior acquisition of strong scientific capacities, which means high investments in training, procurement of research facilities, establishment of strong links with R&D institutions – nationally, regionally and internationally; and, partnerships with the private sector.

[124] BIO-EARN, 2009, p.3. The self assessment document reports in detail on all nine BIO-EARN projects and these difficulties in the local context, resulting in delays in execution is noted almost for each project. The summaries are ours. During the field visit, a more final, updated and detailed information on the outcomes of the innovation fund projects supported was being updated to 2010. These details should be available in the final Bio-EARN completion report in expected in 2011.

[125] Sida stated in the approval of Phase III, that the Goal (we assume this means the long term objective) of BIO-EARN is to *promote the application* of biotechnology in agriculture, industry and environmental management in order to contribute to sustainable development in Eastern Africa. The interdisciplinary biotechnology research was to contribute to sustainable development, products, and capitalize on investments made.

[126] Abeli, W. 2006. Impact Assessment of BIO-EARN programme Phase II in Tanzania (2002–2005, for COSTECH, Dar es Salaam, March/April 2006. It is interesting how Abeli asseses some of the impacts more broadly than done by Sida and the Bio-Innovate proposal.

Under Phase II Abeli says that capacity building focused on two thematic areas; Agricultural and Industrial and Environmental biotechnology. According to the scientists, cassava mosaic and cassava brown streak disease are among the most important constraints affecting cassava production in the region and most parts of Africa, and hence, research using molecular markers for identification of virus resistance in sweet potato, with emphasis on virus diseases in East Africa are relevant. The research in Phase II identified four common viruses and developed one improved diagnostic and breeding method. Also highly relevant are work on molecular markers for fingerprinting and screening for coffee berry disease resistance and how disease free plants could be propagated using tissue culture technique. Equally relevant was the work to develop and optimize techniques for treatment of selected waste water types; the use of agro-industrial solid wastes like sisal pulp, fish waste and potato waste to produce biogas and fertilizers through improved anaerobic digestion.

Abeli found some significant impacts in 2006. He wrote that the Tanzania Coffee Research Institute (TACRI) was adopting the coffee research findings, and had hired one of the trained scientists to work there. One NGO and one private firm were interested in adopting the anaerobic bioreactors technology to produce biogas and electricity. He points out that private sector representatives attended the workshop in December 2005[127] (and we believe there were other such efforts too). He then listed some of the impacts of BIO-EARN in Tanzania that he found, organised at three different levels.

First, for the researchers involved, the outcomes included:

- Improved socio-economic and employment status
- Many had better jobs, and promotions
- They were published in international journals
- Networked with the global scientific community
- Increased their knowledge, capacity and confidence

[127] Those from the private sector knew very little of what was going on in the R&D institutions, they felt most of the research findings end up in shelves or as refereed papers. There was an agreement that there was a very weak link between R&D institutions and the private sector. Everyone applauded the initiative of COSTECH to bring together R&D Institutions and the Private sector to learn from each other through BIO-EARN support. Some thought encouraging more PPP, is the right direction for advancing use of technologies.

- Recognized as national experts with high demands for their advice
- Research managers built capacity to administer and manage research projects

He lists some of their activities and they contribute to the next level of outcomes. One person at UDSM, taught environmental biotechnology at both undergraduate and postgraduate levels; a second person was working at the only institution responsible for bio-safety issues; the third had been hired as a coffee breeder and headed the Coffee Improvement Programme; a fourth trained junior scientists and laboratory technicians in her work; two COSTECH staff offered similar courses to scientists from various R&D Institutions in the country; three technicians (one female) who acquired laboratory experience worked to manage the well-equipped Molecular Biology laboratory and assisted scientists and students in analysing biotechnology data.

At Organizational level the outcomes included:

Beyond the contributions listed individually, he notes the upgrading of the Biotechnology laboratory; and facilitating staff travel to biotechnology training workshops and meetings, had increased the unit's capacity. This then resulted in the Unit being elevated to a full Department. A BSc degree programme in Molecular Biology and Biotechnology was then started in 2003 leading to a steady output of newly trained graduates for the economy.

There was more collaboration and sharing of biotechnology information with other R&D institutions nationally and regionally through improved IT networking and laboratory facilities. This led to improved access to scientific publications and global knowledge base.

The increased capacities at an individual level, not only resulted in individual rewards and satisfaction, but raised the capacity and reputation of their institutions nationally, regionally and globally resulting in interest by various donors to fund new work at the laboratories.

This attracted new research funds from DANIDA for a regional project on Bio-safety and ecological impact assessment that was being undertaken by DMBB of UDSM, University of Nairobi and Makerere University.

COSTECH's capacity to organize and coordinate national workshops and meetings on biotechnology, bio-safety and IPR issues

improved. With such improved capacity, COSTECH has participated effectively in the formulation of National Biotechnology policy.

The BIO-EARN programme initiated and speeded up the process of developing National Biotechnology policy and to some extent in the formulation of bio-safety guidelines. Through a series of biotechnology training and awareness workshops organized by COSTECH (through BIO-EARN and other organizations support), it was possible to come up with a final draft of the National Biotechnology policy in 2004.

At the national level the outcomes included:

Increased numbers competent scientists available. All of them in the country and working in their specialized fields.

Some demand for the research result was noted – one NGO and one firm for production of biogas from agro-industrial solid wastes; propagation of disease free coffee plants and of improved sisal through tissue culture.

Facilitating and holding of a series of policy awareness workshops, the Programme contributed to formulation and drafting of the National biotechnology policy, they narrowed the information gap between scientists, and policy makers

Abeli was optimistic that the interest shown to adopt the results was a good indication for future impacts, sooner or later, to improve livelihoods, ensure food security and safeguard the environment. He concluded, "Although from the research projects undertaken *no product has so far been developed or produced*, on the other hand from the knowledge developed and results obtained, *there is a clear indication that it will be possible to develop tangible products especially if undertaken in partnership with the private sector who have shown keen interest to forge partnership with R&D institutions*" (p.26 emphasis added). Then, "The expected impacts nationally in 7–10 years" (p.35) (that is between 2013 to 2016) should amount to achieving a critical mass of (20–25) well-trained and active scientists in the region; with an ability to carry out advanced biotechnology research independently; and – a number of local crops and breeding systems improved; a number of functional wastewater treatment and industrial biotechnology processes fully developed and ready to be commercialized.

Given the summaries of facts provided by the reports, we attempt some conclusions, guided by the theory and discussions on key findings on innovations discussed in Volume I. First, given the 'newness' of the field in the countries involved, with the required improvements in laboratory equipment, the time required to

train a sufficient of people, the requirements for breadth of capacity development in research, as well as research management, the time line between first inputs, to having *outcome and impact in terms of use* is certainly a longer term process here. Second, there are the *diffuse impacts* from the persons trained, who are training new people in these countries, and the new people are being employed in jobs, where they are contributing to increased production, productivity or safety, all innovations[128], that are not being investigated or reported as such by Sida. Such impacts, and their relative economic value, cannot be determined in the scope of this study, and they also pose methodological difficulties. But to jump to the conclusion that only a new product or process, contributes to the economy, is to ignore what is the *primary mission* of an University, to increase human capacity as having no economic value. Impacts are also seen on the second mission of the University to *increase knowledge production* through research, and provide *improved access to the global knowledge base*. What can be said is that none of the approval and assessment documents for the investments, gives much attention to all the different types of potential economic impacts, many of which require more sophisticated methods than a simple count of artefacts in use.

It is important to point to the focus on the time dimension by Abeli, and whether more direct impacts should only be anticipated after another period, say five years or even at the end of the Bio-Innovate. It is quite possible that the sequencing of the interventions are appropriate and direct economic impacts can only be seen later, as Abeli suggests somewhere between 2013 to 2016, at the end of Bio-Innovate Phase II, and the error made is more due to the preoccupation to demonstrate short term impacts in terms of artefacts of technology.

Another unmet dimension was additional support by partners. It was always stated in approval documents that additional support was likely or had been pledged by regional governments, donors and foundations, but these did not materialize. Sida/SAREC remained the main, (or possibly the sole contributor) to BIO-EARN, for a total of SEK 172 million. There were also challenges to meeting the goals of greater "local ownership" and improving management efficiency in the institutions in the region. In 2005, towards the end of Phase

[128] It would be useful if Sida supported a study to determine and understand more clearly, the tasks in which the researchers are engaged in after their training, their outputs and movement over time, as well as the work being done by new trainees, together with the context for use of biotechnologies.

II, Sida believed, it had created an "appropriate, regionally owned, governing structure formally agreed, and with skilled and qualified individuals to implement administration and operational activities at the secretariat". The same year, Sida contradicted that[129] - "Regrettably, UNCST and the regional coordination office have not been able to serve the programme as efficiently as was expected." Hence, as mentioned earlier, the coordination was moved to IUCEA for Phase III, with the logic that this was a regional institution; and, with responsible network partners managing the program, a limited role of SEI, and new management structures with a Governing Body, a Program Advisory Committee, Regional Office, all at IUCEA, would improve integration and harmonization with national activities and increase the local ownership. But in 2009, when the Governing Body, Advisory Committee and the Regional Office made the proposal for the new grant, Bio-Innovate, Sida determined that the secretariat needed to be changed, as there were ongoing and unresolved administrative challenges in Phase III. We believe it to be very likely that the new program would be better managed at ILRI, where it has been located now. But the hoped for improved efficiency is at the cost of goals of "ownership" and "local management", which had been espoused earlier. In our view, the issue is not that these changes were made, and they may be for the best. The issue is that the facts of earlier challenges and what steps were taken to resolve them is never discussed. It is not also mentioned that there are possible trade offs between goals, perhaps between efficiency and ownership. This lack of open discussions, is certainly at a potential cost to the principles of "transparency", with a resultant cost to the required "trust" by stakeholders.

A fairly glaring weakness in conception and the design, has been in the use of words such as "innovation" and how to promote it, with great imprecision. Very often the word research and innovation are used interchangeably. The concept used in the design is firmly rooted in the "linear view" of research leading to applications and use. It does use one idea from innovation systems literature, that use requires constant interchange between diverse actors and considerable resources were provided for activities for collaboration and information sharing. These focused on interchange

[129] PROMEMORIA Department for Research Cooperation (SAREC) 7 October 2005 Gity Behravan Ref. number - 2004–000,515. It said there were many reasons, and included institutional problems at UNCST involving heavy involvement of coordinating staff in other activities.

between the science, research and policy makers, and supported by the experience of SEI, the efforts were in fact effective in developing policy capacity in biotechnology and bio-safety and is documented among the important outcomes.

Among flaws in the design is a lack of awareness of the difficulties that needed to be overcome in improving research management skills, university level administrative bottlenecks, procurement at participating institutions, and challenges in linking to the private sector. These were often not recognized, and when recognized, activities to improve them were not completed due to limited, or non-allocation of resources to for the activities. A final error in design, in our view, that is tied to an innovation systems view, is the lack of appreciation that "coordination" of a multi-stakeholder initiative, that attempts to link sectors that are both weak in themselves, and weaker in their linkages, especially in linkages to market actors, would require a more active coordination. A "lean" management budget in fact penalized the overall effectiveness for a mistaken efficiency. Further, the innovation fund was too small at 11 % of the total value to support all the tasks allocated and that were required.

In our view, the differences between the stated assumptions and expected outcomes, suggest the requirements of time; financial resources; the requirement for linkages; and, the requirements for managing this very complex research and application exercise by the partner organisations and the needs for overall coordination were all under-estimated and under funded through an emphasis on "lean management". Even within the "linear model" that it seemed to subscribe to- training and capacity building followed by research, then applied research, and then the use and application – the design is inherently flawed as it did not allow for the much larger funds that are required to take research results, where appropriate, through "pilots" and models from the research lab to further field testing, dissemination and use, all requiring many additional activities and actors than provided for. Another shortcoming of the design and the resultant intervention has been the poor knowledge of the local context and for applications, in particular knowledge of the capacity, needs and incentives of the actors and of the private sector, in particular. The limiting of the role of SEI in favour of building local ownership, reduced the skills and knowledge available to Sida and the partners, increasing the challenges.

There is another conceptual weakness to the design. Not all research, and not even most research, however successfully

undertaken, leads directly to a new product or process. The research and knowledge required to make the breakthrough in finding a virus resistant crop may simply require more time and more resources than can be provided, in rich or poor countries. A recent FAO analysis[130] says – there is no straightforward recipe for the use of a particular group of breeding or management methods for a particular crop or within a particular region. It notes, many previously complex and expensive technologies have become cheaper and easier to access but financial, institutional, socio-economical and political barriers known for decades and basic gaps in seed supply, bank loans, transport and markets, can negate even the most impressive technological solution. It points to inadequate market infrastructure as limiting fertilizer adoption by African smallholders, leading to persistently poor crop yields and low profitability and provides as an example, use of existing and recommended practices would allow Ghanaian farmers to double or triple the average yields of most staple crops. It cautions crop varieties developed by the most sophisticated new technologies will have little impact unless they are effectively taken up by farmers on a sustained, long-term basis and that even with modern breeding and crop management technologies, it can still take a decade or more to make improved materials available to farmers. Then their adoption can take much longer. The linkage between agriculture researchers, extension services and producers is weak in Africa, resulting in poor uptake of innovations. It says that among major hurdles to the use of improved varieties is the weakness of the local seed systems and in Africa, "(Most) extension services are characterized by a lack of information, technical capacity and logistics for timely delivery of advice to farmers. They have inadequate capacity in terms of personnel and are unable to formulate and implement good and sound technology transfer approaches." While fundamental for advice to farmers and for seed production and distribution, they are frequently overlooked by researchers, policymakers and in budget allocations, and in terms of the innovation systems literature, by all who support the linear view of research leading to use.

[130] FAO, 2010. Agricultural biotechnologies in developing countries: Options and opportunities in crops, forestry, livestock, fisheries and agro-industry to face the challenges of food insecurity and climate change, prepared for a conference in Guadalajara, Mexico, 1–4 March 2010, Ref. ABDC-10/3.1, January 2010

The innovation systems theory does not say, that we know or provide for all the answers, or can design a fail safe intervention strategy. But it has robust elements of known facts and theory to highlight elements in the design that may be missing in the interventions for innovation. We underline and repeat here, the achievements of capacity building, networks, regional cooperation, formulating and implementing some policies, and improved dialogue between scientists and policy makers must be noted as important outcomes and are all highly positive. The critique made should not overlook the achievements. The point here is more simply, looking at this from the "innovation" lens, this intervention did not learn or apply a great deal from the innovation systems approaches, nor did it build systems within the intervention, that would consistently increase "systems level" learning by the different stakeholders.

BIO-INNOVATE (2010–2014)

BACKGROUND

Bio-Innovate flows directly out of and is the successor to the last phase of BIO-EARN. Researchers in the network began working on a new proposal in 1998 and a new Concept Note was presented to the Governing Board with four thematic areas. It focused, as before, on the improvement in crop productivity, quality of food and nutrition security; technologies for bioremediation and waste management; and policy development, but it increased the emphasis on taking results to the market place. The proposal was prepared by a committee with five members, four network researchers and the BIO-EARN coordinator. It was sent to Sida by BIO-EARN Governing Board Chairman, the Director General of COSTECH in June 2009.[131] The proposal called for a four year program that would "build on and crystallize the achievements of the BIO-EARN Programme for regional development", with plans to consolidate

[131] This was announced in the BIO-EARN Newsletter, Issue No.5, June 2008 – June 2009. The proposal was revised and updated in consultation with NEPAD, ILRI & Sida with a final version in 29 January 2010. The only change that we found between the earliest and the final version was the change of management and location of the coordination office from IUCEA to ILRI. Ironically, in a repeated pattern, for Phase III, Sida had received the proposal from the Uganda National Council for Science and Technology (UNCST) on behalf of the region, but due to difficulties with the arrangements in Phase II, the coordination for Phase III had been moved to IUCEA.

past achievements, and also highlighted some areas of difference from the past.

OBJECTIVES

The objectives state[132] that the new program will focus on delivering *new products* through bioscience innovation systems involving a broad sector of actors, including scientists, private sector, NGOs and other practitioners. It will use modern bioscience to improve crop productivity and resilience to climate change in small-scale farming systems, and improve the efficiency of the agro-processing industry to add value to local bio-resources in a sustainable manner. Bio-Innovate will be "*user-, market- and development*-oriented in order *to make a difference on the ground, in supporting poverty alleviation and sustainable economic growth*".

DESCRIPTION

The proposed New Program on "Bio-resource Innovations Network for Eastern Africa Development" (Bio-Innovate) will target bioscience and product oriented innovation activities in Eastern Africa (Burundi, Ethiopia, Kenya, Rwanda, Tanzania, and Uganda). It builds on previous investments, achievements and experiences from the BIO-EARN Program and other regional initiatives. Bio-Innovate will be user-, market- and development-oriented in order to make a difference on the ground, in supporting poverty alleviation and sustainable economic growth.

The core elements of Bio-Innovate Program are described as:

Crop production, adaptability and diversification: The focus is on intensification of R4D that promote bio-resource innovations to enhance productivity, nutrition and food quality and foster climate change adaptation of selected strategic commodities such as sorghum, millet, cassava and sweet potato in Eastern Africa. This focus is underpinned by the fact that climate change is likely to affect production of bio-resources including crops and therefore is of strategic importance to the region.

Environmental protection and management. This theme targets two areas: (i) Protection of water resources and the environmental areas within the agriculture and natural resources sub-sectors.

[132] As expressed in Leta, et al "Innovation Network for Eastern Africa Development (Bio-Innovate)," Program Proposal. The italics have been added by us for emphasis. All descriptions come from the final approved document.

R4D will focus on bio-energy recovery from solid waste and wastewater, wastewater treatment and reuse, bioremediation of contaminated environment and carbon sequestration; and, (ii) Undertaking studies on the potential impacts of climate change on Eastern African agriculture and the broader natural resource sub-sector; including studies on mitigation and adaptation options to climate change, including policy options for different countries.

Technology incubation. The aim is to enhance up- and out-scaling of new innovations through technology incubation centre(s) and innovation platforms, thereby, improving adoption and deployment of science-based solutions to development challenges in the region.

Policy advisory and advocacy activities. The purpose is to harness and/or develop the enabling policy environment(s) for bioresource innovation, adaptation and diffusion according to the needs, abilities and opportunities within Eastern Africa.

It states that calls will be made in the four priority areas, with the first call targeted to the use of biosciences to *promote adaptation mechanisms to climate change in the region*, operating on excellence and the ability to deliver the results. It plans not to fund more than ten regional, multi-disciplinary innovation projects/consortia within the four thematic areas, with each project having a budget in the range of SEK 1–3 million/year.

The new proposal and plans emphasize the use of a "Competitive Grant Scheme (CGS) where emphasis in the selection will be based on the *active involvement of market actors and practitioners*, ensuring that knowledge and technologies are used in response to real needs and that efforts and investments are sustainable and also the provision of matching funds and long term commitment from market actors, governments in the region, and other donor agencies" (emphasis added).

It says, in the final revised version, that to strengthen regional ownership and accountability the program will be hosted by ILRI in Nairobi. It highlights that a prominent feature will be a "continuous and rigorous monitoring and evaluation (M&E) component", with annual reviews, ensuring efficiency and maximum impact, and the M&E system will be developed. Each approved project will be required to have clear log frames on outputs, outcomes and activity schedules, which will be closely monitored. A crucial task listed for the "Programme Management Team is to ensure that the M&E routines are established and fully implemented".

The intended results of Bio-Innovate are:

1. Crop innovation systems strengthened to improve productivity and enhance food and nutrition security in the region and innovations to enhance crop adaptability to the consequences of climatic change, crop diversification and productivity constraints.
2. Innovations for bioremediation, waste management and mitigation of climatic change developed and promoted through innovations for environmental clean-up, waste management and sustainable use of resources.
3. Regional innovation systems catalyzed to deliver above innovations. Technology incubation and other mechanisms for putting research into use will be developed and operationalized.
4. Innovation policies for harnessing of bio-resources developed and promoted through policy support, analysis, studies, to provide decision support tools for bio-resource innovations in Eastern Africa.
5. An enabling mechanism for mobilization, catalysis and nurture of a strong bio-resource and science-led economic growth agenda for Eastern Africa strengthened and operationalized and this is stated to occur as an overall outcome of the above four results.

The proposal states - "Bio-Innovate build on the experiences, capacity and lessons of BIO-EARN and other actors. It will focus on bio-resource innovations for product development and delivery systems. It will be based on regional, interdisciplinary innovation projects, linked as consortia and be comprised of a range of value chain actors critical to span the process from science to production and markets that interface value addition and innovation through interlinked activities. The ultimate goal would be to enable small-scale farmers in Eastern Africa to benefit from the remarkable productivity gains possible through modern biosciences."

OUTCOMES

At the time of the visits and interviews, the new program had been operating for only about six months. One of the researchers and team leader from the BIO-EARN network, who had been trained and undertaken national level research in the region had been selected by the program committee as the program manager for the new program. ILRI managers were enthusiastic about the new program and looked forward towards potential synergies. The program had issued the first call for competitive research proposals, which were

then about to be judged, and the best were to be selected for support. The program is in its early stages and no outcomes can be expected at this time.

OBSERVATIONS

We begin with the caveat that the comments below must not be considered as an evaluation and are deliberately listed as observations. The program had been operating for only about six months, with a new program manager in a new location. Based on the interviews, we believe the choice of the new manager given his knowledge and experiences, both in the science and the local context very appropriate. It was also positive to note the enthusiasm of ILRI managers about the new program, the opportunity to work with Sida and potential for synergies for research outputs in the region. The comments below follow from the discussions, combined with the examination of the design, reported activities, and the comments made earlier on possible deficiencies and lessons of BIO-EARN, through the innovation systems lens discussed in the main report.

BIO-INNOVATE AND BIO-EARN

The proposal for the new Bio-Innovate Program states that is to a large degree building on the infrastructure capacity, experiences and achievements made in the BIO-EARN Program. It also highlights critical differences that separate them significantly and some of them are discussed below:

1. One fundamental difference is this will now be based on "competitive grants through a regional research fund". In our view the difference between research and innovation remains poorly articulated and there is no evidence that a competitive regional research fund would promote more innovations or even necessarily produce better research. We have some concern that in the new scheme, there is a potential for the research outputs to be worse than before. This is because, competitive mechanisms are no panacea and the activities selected and outputs, would to the most extent be determined by the program design, which sets the description of the calls, the rules, the weightage given to different factors, and these would be further influenced by the constitution of panel members that judge them. It is not recognized that changes to any of these would result in different winners and choices of activities to fund.

2. It is stated that the new program will be more user-, market- and development oriented without ever spelling out how and what differences are there between the earlier intent, where this was also stated and the current program. It is suggested that some of change of orientation will be achieved through ensuring matching funds by private sector partners or other practitioners. There is no assessment of the risks and implications of not meeting this condition. It is stated that now it *has a broader and more inclusive network*, which is not defined in operational terms nor does it seem to recognize well known difficulties of linking markets actors to research, a key focus of innovation systems literature.[133] It does incorporate the idea from innovation literature that innovation requires a multiplicity of partners, but does not address the questions whether they do exist, who they are, nor assess the partners' capacities and needs, and whether they are ready to join.
3. The new program adds Burundi and Rwanda as two new countries where the network will operate, expanding the total countries from four to six. In our view this adds to the potential challenges as the resources added by these two countries is likely to be low, but instead their addition increases the demand on the funds and for program management and coordination.
4. The program mentions greater "focus on inter-disciplinarity", technology and knowledge dissemination and adding socio-economic and environmental analysis to policy analysis. But there is no clarity on what these imply or how these activities will be undertaken and be different than before.
5. The document states the new structure would be more "directly connected to the regional agenda, through the linkages with the "Biosciences Eastern and Central Africa" (BecA) – International Livestock Research Institute (ILRI) Hub in Nairobi, and through this, link to AU/NEPAD, making Bio-Innovate more closely linked to operational decision making in the region", which does not make for any operational plans to solve "ownership" issues or all required linkages.
6. The document is insistent that there would be "a more effective program management structure", and a stronger M&E component, that would focus on communicating lessons and experiences

[133] It does say that it will now include partnerships with those "who are working with the private sector and non-governmental organisations".

generated.[134] We believe in the intent of the program management team, but the only concrete mechanism that is provided is to add "a communication specialist" in the team, a team that remains "lean" and focused on administration as before.

We conclude, that for us the similarities between BIO-EARN and Bio-Innovate are larger than the differences. Both focus on the same four strategic, thematic areas of research (but now climate change is added as a new concern[135]); the program continues to provide *research grants to bioscientists* and now these have been deemed to be competitive grants to researchers.[136] Given the small pool of trained persons in the region this will probably end up by choosing the same people, except for the additions from two new countries. The effective continuity of the BIO-EARN research network, even with a new name, could in fact be a *barrier to innovation*. At the same time, the tinkering around the edges on the rules, without clarity on their intended effects, could lead to the unintended outcomes of poorer research outputs than before. Using our theory of innovation systems, we can see that the objectives do promote "demand driven research" and specific uses. They also emphasize the aim to involve a broad sector of actors. Both of these statements are in accordance with the theory but were also highlighted in BIO-EARN Phase III.

The new proposal document adds a "Risks" identified and mitigated column that needs considerable additional work. Conceptual improvements in understanding and mitigating risks, would be expected to lead to modifications to the program design so as to

[134] It highlights the audience is the "broader public" and "policy makers in the region" without first noting the need for lessons learned by project management, by Sida and the network itself.

[135] It would work in the first three years to support five research-based projects working to improve the productivity of sorghum, millet, cassava, sweet potato and bean farmers; to help smallholder farmers adapt to climate change; to improve the processing of wastes in the production of sisal and coffee; and to better treat waste water generated in leather processing and slaughterhouse operations.

[136] The FAO data set available at FAO-BioDeC – http://www.fao.org/biotech/inventory_admin/dep/default.asp?lang=en, is a database provides information on the state-of-the-art of crop biotechnology products and techniques, in use, or in the pipeline in developing countries, with over 2000 entries from 70 developing countries. It was reviewed to examine the status of applications of the techniques, products and processes in the same areas of focus of BioInnovate in Africa. In all cases and in all countries, the data base reported that the crops remained in the research/experimental phase.

reduce them. There is no mention that the management moved from IUCEA to the International Livestock Research Institute (ILRI) or that the the concepts of "local ownership" was challenged, and how it should be promoted in the new program.

To finally sum up, it is our view that while both BIO-EARN and Bio-Innovate discuss some of these ideas of innovation systems and some of the same words in the documents, the activities and the project design do not suggest sufficient learning nor support their effective implementation. Rath and Barnett created a list of indicators to judge the extent to which a research intervention incorporate some essential characteristics of an IS approach.[137]

Applying the simple set of indicators for the use of IS concepts developed by Rath and Barnett, we find that most of them were poorly understood, not often provided for in the design and resource allocation, and hence in the activities of BIO-EARN project. Given the continuities that we discussed as well as the new complexities that have been added in the new Bio-Innovate design, provides a cause for concern. The research outputs and the human and infrastructure capacity building that have been achieved as outcomes earlier are very impressive and it is important to ensure improved outcomes. This is a very interesting project that address the real needs of the group of countries to catch up in this new area of technology. The literature confirms that applications of biotechnology

[137] Rath, A and Barnett, A. 2005. Innovations Systems: Concepts, Approaches and Lessons from RNRRS; RNRRS Synthesis study No 10, The Policy Practice Limited, 3 January 2005, available at R4D Output URL: http://www.dfid.gov.uk/r4d/SearchResearchDatabase.asp?OutputID=176,979. The set of indicators, were developed as a heuristic tool to examine a portfolio of "research for use", to determine whether they incorporated some essential characteristics of an IS approach. Essential characteristics were determined to be – knowledge suppliers and users, both are centrally involved, in some form of partnership, coalition, strategic alliance of mutual benefit; *user needs understood through genuine and continuous involvement* of all "end-users" (producer, consumer or processor) to assist in the determination of *the initial problem and to provide iterative feedback*. As the innovation evolves; investments are made in the "system", that is expenditures are made in parts of the *system in addition to the research*; and, *Intermediary functions are performed* and/or organisations that perform intermediary functions such as consulting firm, NGO, or CBO are actively involved. In addition, a financially *viable business model* to supply the innovative technology or service (this often involves manufacturers, service providers, credit suppliers, and providers of technical assistance to users) exists; and *Learning results from iterative action research*, that enables the organisations to learn from experience and improve their performance are provided for and function appropriately.

can provide a very significant potential for economic but it is a more complex undertaking than assumed in the documents reviewed.

RECOMMENDATION

It is our view, if our analysis is accepted, that Sida must urgently consider additional steps that could strengthen the program and increase the probabilities of the desired goals being achieved. First there must be additional studies, with sufficient depth and scope with considerable stakeholder involvement, to better understand and then draw lessons from the past experiences, together with the regional and local context, for Bio-Innovate to achieve its goals. The same study or another linked activity should include support for developing the M&E framework that is a key requirement and rightly emphasized in the proposal, and ensure that it moves beyond a checklist to include both indicators and a set of "practice" that allows all stakeholders to work towards the larger systemic goals on Bio-Innovate.

REFERENCES:

Abeli, W. S., (2006), "Impact Assessment of Bio-EARN Programme Phase II in Tanzania [2002–2005]", An Evaluation Report Undertaken on Behalf of COSTECH

BIO-EARN, (2009), BIO-EARN Programme Self-Assessment Report, Compiled by BIO-EARN Regional Coordination Office, June, 2009.

FAO, (2010), Agricultural biotechnologies in developing countries: Options and opportunities in crops, forestry, livestock, fisheries and agro-industry to face the challenges of food insecurity and climate change, prepared for a conference in Guadalajara, Mexico, 1–4 March 2010, Ref. ABDC-10/3.1, January 2010

Komen, J. and I. Virgin, (2006), Synthesis of National Impact Reports for BIO-EARN Projects and Programme Activities in Phase II (2002 – 2005), September 2006, SAREC and Bio-Earn.

Leta, S., P. Okori, G. Persley, A. Wangai and I. Virgin, (2009/2010), "Innovation Network for Eastern Africa Development (Bio-Innovate)," Program Proposal. First submitted by BIO-EARN Governing Board Chairman COSTECH, June 2009; Revised and updated in consultation with NEPAD, ILRI & Sida, 29 January 2010.

Morris, E.J. and N.P. Louwaars, (2004), The East African Regional Programme and Research Network for Biotechnology, Biosafety and Biotechnology Policy Development (BIO-EARN). Sida Evaluation 04/09. Stockholm: Swedish International Development Cooperation Agency.

Mukiama,T., P. Rubaihayo, K. Dagne, A. Kullaya, R. Edema, P. Okori, and A. Bananuka, (2006), "BIO-EARN Programme Proposal (2006–2009)", Proposal to Sida

Rath, A. and A. Barnett, (2005), Innovations Systems: Concepts, Approaches and Lessons from RNRRS; RNRRS Synthesis study No 10, The Policy Practice Limited, 3 January 2005, available at R4D Output URL: http://www.dfid.gov.uk/r4d/SearchResearchDatabase.asp?OutputID=176,979.

Rath, A., G. Björklund, M.A. Lansang, O. Saasa, and F. Sagasti, (2006), "SAREC Support to International and Regional Thematic Research Programs 2000–2005: Individual reports and Cases", Sida

Salih, M. and A. Svensson, (2008), Organizational Review of VICRES and BIO-EARN Programmes at IUCEA, Final report, 10 March 2008

Sida Assessment Memo, (2009), Support to the BIO- RESOURCES Innovations Network for Eastern African Development (BIO-INNOVATE) for the period january 2010 – december 2014. Regional Team for Environment & Economic Development – REED, Gity Behravan, 1 December, 2009, Ref. number: 2009–000,712.

PERSONS INTERVIEWED ON BIO-EARN AND BIO-INNOVATE:

Gity Behravan, Sida
Hassan Mshinda, DG, COSTECH
Rose Kingamkono, Director of Research Coordination and Promotion, COSTECH
Pantaleo Chuwa, Senior Research Officer, COSTECH
Anne Wangai, Regional Coordinator, IUCEA, Kampala.
Mugassa Rubindamayugi, Microbiology, UDSM
Seyoum Leta, Bio-Innovate Program Manager; ILRI, Nairobi.
Bruce Scott, Director, ILRI
Carlos Sere, DG, ILRI
Bo Mattiasson, Department of Biotechnology, Lund University

10 Research network: UniDev

BACKGROUND[138]

This is a research project that began in May 2005, with the full title "Developing Universities – The Evolving Role of Academic Institutions in Innovation Systems and Development". It was conceived as a response to the need for examining the changing conditions within which the universities in the countries define (or re-define) their roles, within the contexts of the demands for innovation, economic growth and development. The project was initiated as a collaborative research network by institutes in ten developed and developing countries. This number subsequently increased to fourteen countries. Twelve countries were selected as case countries – Brazil, China, Cuba, Denmark, Germany, Latvia, Russian Federation, South Africa, Sweden, Tanzania, Uruguay and Vietnam. Two other countries, Nicaragua and Mozambique also took part in some of the UniDev activities, but were not as involved.

The project objectives were primarily to undertake research to better understand the changing role of academic institutions in a number of different national contexts. The research questions include – how universities and research institutions function in each country, and their roles, given the different local contexts and economic systems, the different national innovation systems (NIS) (small vs. large countries, countries with strong vs. weak national innovative capacities, etc.), and how they are responding to both globalization and the increased local demands. It also aimed to contribute to a process of policy learning and exchange between countries in different stages of economic development. Finally, it aimed to generate public discussions and national policy responses, and also influence international organizations.

[138] This is prepared by Amitav Rath based on documents listed and interviews and supplemented by the survey of participants in the UniDev research program. The survey was designed by the evaluation team and managed by Mario Bazán and Fernando Prada Mendoza, FORO. The survey results are provided at the end of the chapter. The comments are as provided by the respondents and while some of them are used in this report, they are of most benefit to the members of the network.

The country case studies, aimed to include studies of the internal dynamics and structures of universities – the balance and connections between research and teaching, between different knowledge fields, and, between knowledge refinement and social interactions, the internalisation of innovation and management structures. Furthermore the study focused on funding, with special attention to the interaction between local, national and international funding streams; especially the role of international influences and steering; and also how universities are handling and promoting inclusion, especially gender, and, other equity issues such as ethnic diversity, and also as sources for strengthening innovative capacity.

The researchers summarize that the two historical and primary tasks of universities are teaching and research, with the first providing society with individuals that have academic knowledge and skills, and the second provides for the generation and repository for new knowledge and ideas.

But the researchers state expectations have increased exponentially and demands are originating from a much wider range of stakeholders. Universities are now given progressively more important roles in economic expansion, social development, better forms of political organization and governance, plus providing education for more students, and developing and transferring technology to industry. New models to guide the evolution of universities include the Triple Helix, the creation of entrepreneurial or specialized universities, large-scale excellence-driven environments and the concept of developmental universities.[139] Most of these formulations ultimately suggest that universities move towards technology-oriented third missions, thus a closer interaction with enterprises. They find that the capacity of universities to respond is insufficient, in both the developed and developing world.[140] The researchers provide some conclusions on how universities should function within different contexts in order to fulfil their role and potential as anchors of economic

[139] The idea of the "entrepreneurial universities" is more common in the industrialized countries while the researchers in the network felt more comfortable with the idea of the "developmental university", proposed by one member.

[140] Excerpts from Göransson, B, Maharajh, R. and Schmoch, U. 2009. New challenges for universities beyond education and research, Science and Public Policy, Volume 36, Number 2, March 2009, pp. 83–84. This special issue of Science and Public Policy explores these issues in the twelve countries. The entire volume of this prestigious science policy journal was devoted to the case studies generated by this project.

development and national innovative capacity and recommendations on how policymakers can assist.

In exploring these issues, it employed a "comparative, multi-stakeholder and multilateral approach. The project has worked in close collaboration with national networks of researchers and policymakers in selected countries and organizations. In each country, the aim has been to engage one research organization and one policy-making organization as main partners in the research. The interaction between the researchers and policy makers during the project has taken place through national policy workshops organized by the UniDev network members. The workshops have provided a platform for discussion between researchers and policy makers – for ensuring an agreement on the relevance of the research for policy making as well as for firmly anchoring the project work in relevant policy-making bodies in preparation for discussions on research results.

The project UniDev has contributed to the identification of 'good' practices for policy prescription as well as to facilitate constructive dialogues between national policy makers, representatives from the entrepreneurial sector and the research community. Moreover, we hope that the results from the project work will provide useful insights for international and development organisations in the formulation of development strategies in the support of knowledge for development.

ACTIVITIES

In total each country received around USD 10,000 per year to cover research activities to produce at least one research study per year on jointly agreed topic, to organize and carry out a national workshop with Triple Helix participation, and to participate in the UniDev meetings. In the original project plan, three meetings had been planned – a preparatory, a mid-term meeting and a final meeting. While these were carried out as planned, the network succeeded in efforts to meet more frequently by being able to 'piggy-back' on other large conferences – such as the Globelics (third to sixth) conferences and the bi-annual International University conferences in Havana to meet on 6 additional occasions and locations.

In two of these conferences, UniDev members organized a special session on their research on the role of universities and presented papers.

OUTPUTS

The research outputs include – two books with proceedings from the national workshops; one book on the Evolving Role of Universities with 16 chapters, to be published by Routledge/IDRC; book on Biotech with 13 chapters to be published by IDRC; a special issue of the Science and Public Policy journal with 13 papers; and over 50 articles, papers and reports.

The outputs judged primarily on the research outputs generated have been outstanding. They have also been rated high both in the self evaluation conducted by the project and the survey carried out during this evaluation.

OUTCOMES

As a result of the consolidation of the network, additional projects were undertaken outside what had original been planned. Researchers in Brazil and Cuba jointly undertook a two-year study, financed by CNPq, Brazil, examining the two countries' which resulted in the report: University and National System of Innovation: A comparative study. IDRC funded the network to carry out national studies on private and public appropriation of biotechnology.

Other outcomes are listed in the survey and there have been many capacity building and strengthening outcomes.

The self-evaluation[141] of whether the initial objectives have been attained concluded that – two of the objectives "sharing lessons and experiences with other researchers nationally and internationally" and "the emergence of an international network on the emerging role of universities, playing a lead role in policy discussions", was rated among the highest achievements. On the other hand many countries felt they failed in achieving a meaningful participation of policy makers in national workshops, knowledge exchange between researchers and policy makers and a Triple Helix dialogue between policy makers, productive sector and the research teams, were goals that. This outcome is not surprising given the many known difficulties in influencing national policy debates and policy formulation on universities and also bringing together members from the productive enterprises on longer range policy issues in many countries.

[141] Göransson, B. and Brundenius, C. 2009.

ASSESSMENT

The assessments are based mostly by a review of the activities, outputs from documents, the self evaluation and the very positive results from the survey of participants from developing countries. See parallel volume on survey results for detailed findings from the survey of UniDev participants.

Relevance: The intervention is highly relevant as per the needs and priorities of the research participants, the importance of higher education and knowledge; and, the policies of recipient countries and donors to increase capacity to achieveoutcomes for development. This follows from the theory discussed earlier as well as the Sida assessments and the feedback of participants.

Effectiveness: The intervention has been highly effective in building capacity, sharing of information and experiences about developments on methods, analytical results and policy relevant experiences on innovations, created a strong network of senior and some younger researchers. It has generated new ideas, research and policy proposals, produced a high number of quality outputs and that are also widely disseminated.

Impact: Beyond the capacity increase among the individual participants in terms of their knowledge and ability to undertake higher quality research and network with global knowledge, most respondents mention direct participation and exchanges on policy advice; in use in further training of students; in providing the knowledge gained to users of different kinds.

It also lined with and gained from the Globelic research network and from the participation of some researchers involved in the Tanzania cluster project and linked to biotechnology policy work though not closely with BIO-EARN. The degree of linkage between separately funded Sida projects is to be commended. It is possible that the coordinators and Sida could have obtained greater direct impact if linked with some other bilateral support to universities.

Sustainability:The continuation of the network activities is likely to depend on future Sida funding. It is positive that it has generated other funds for its research such as from IDRC and some national sources. But the network members will have to rely on a degree of outside funding to continue. The degree of sustainability is appropriate for the nature of activities of the network.

Efficiency: The contribution of Sida given the size, nature, duration and outputs of this research network is very reasonable. Based

on our knowledge of similar research networks, and some of the other networks that have the same objectives, this network is highly efficient. Many network members have contributed with considerable funding to the project as well as by devoting extra research time, above that provided by Sida for the project.

There is only one alternative that comes to mind that could increase efficiency and that would be increased access to non Sida resources, but that is not always feasible.

The rating for this is excellent overall, in that we noted no significant shortcomings.

SOME FACTORS RESPONSIBLE FOR THE SUCCESS

The chance to get funding has not been a driving force for the participants. First, the original and initiating members (ten) already knew some of the other members through earlier project work or meetings such as Globelics and the network project began with a significant level of trust and dedication, which often needs to be built in networks created from scratch. The members saw the network as a means to achieve as a group what they could not do alone. Second, the coordinators were able to use the funds in a flexible manner, for activities that were difficult to fund for the recipient, as long as they delivered the agreed outputs, as it was not ear-marked. Many research groups had problems to fund the international travel to conferences and exchanges of researchers. They were able to use their own or local resources for the research and used UniDev funds for meetings. This kept the total costs the same, but increased the efficiency and learning possibilities for the network members.[142]

CONCLUSIONS

The innovations systems theory and much work on the use of research for policy, confirms the difficulty of achieving the larger social outcomes that the researchers had placed before themselves. While the close contacts among the network members provided the benefits of high quality research outputs. It is likely that it also shut out policy makers and firms as they were not a part of the same network.

Sida could have been more pro active in making use of the knowledge generated at forums where it has greater access to policy makers than could be achieved by the researchers alone. Sida should see

[142] Communications with the project coordinator.

itself as a "partner" and "network member" that should assist beyond the provision of finances, to assist in the dissemination of results and the process of change in partner countries. But Sida is limited by its staff and process constraints from playing a more active and participative role.

A thought for the organizers and Sida to consider in any future development would be whether additional pointers from the innovation models could have been adopted to make this set of activities even more effective? Given the problem that was being researched could there have been benefits of more scientists and engineers participating and also could the cluster projects and other bilateral university and research council beneficiaries of Sida support in low income countries, have been invited with the idea of working more directly with them by linking the users with researchers, more closely, very directly and to solve specific issues?

We also note that it is our view that such expansion cannot be carried out beyond some carefully determined limits. But the possibility of additional experiments that could apply the fundamental ideas of "learning by doing" should be explored carefully.

REFERENCES

1. Göransson, B. and C. Brundenius, 2009. Developing Universities – The Evolving Role of Academic Institutions in Innovation Systems and Development, UniDev, Final Report for the project, Lund University, August 2009
2. Science and Public Policy, Volume 36, Number 2, March 2009. The entire volume of this journal was devoted to the case studies generated by this project.

LIST OF INTERVIEWEES

Bo Göransson, Lund University
Claes Brundenius, Lund University

THE SURVEY

SAMPLE

The electronic survey was sent to the subset of 25 people from nine developing country organizations that participated in the research project "Developing Universities-The Evolving Role of Academic Institutions in Innovation System and Development" (UniDev). The

project coordinator of UniDev provided the names and addresses. The survey was open for two weeks, December 9 - 22, 2010, and a reminder was sent after week one. From the total sample, sixteen people answered the survey (64.0 %). Responses were received from seven countries: Brazil, Cuba, China, South Africa, Tanzania, Uruguay and Vietnam. No responses were received from Mozambique or Nicaragua.

Sixteen answers were obtained from seven different countries. Most of the respondents were men (68.8 %) and had PhD or Master Education (62.5 % and 31.3 % respectively). Almost all (94 %) people has ten or more years of experience and most were trained in social science (43.8 %), in natural science and engineering together, providing the second most common training, at 25 %. 43.8 % of the respondents work at a university and a similar number at a research institution organization and only two (12 %) work in a government agency and a NGO.

All comments to questions provided below are as provided by respondents.

Table 10.1: Member of the following developing country team

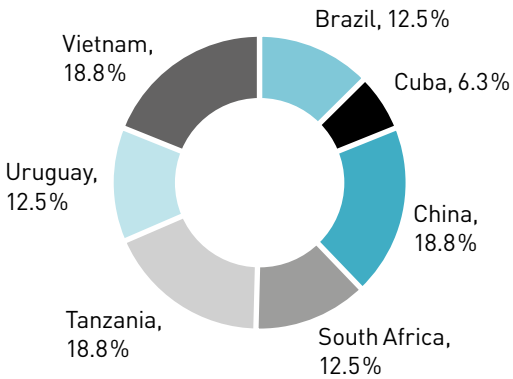
	Total population (A)	Response Number (B)	% by country (B/A)	% of total
Brazil	2	2	100.0	12.5
Cuba	4	1	25.0	6.3
China	3	3	100.0	18.8
South Africa	3	2	66.7	12.5
Tanzania	3	3	100.0	18.8
Uruguay	3	2	66.7	12.5
Vietnam	3	3	100.0	18.8
Mozambique	2	0	0.0	0.0
Nicaragua	1	0	0.0	0.0
Total	25	16	64.0	100

Table 10.2: Sample of Survey to UniDev

		#	%
# people that received the survey		25	
Total respondents		16	64.0%
Gender	Female	5	31.3%
	Male	11	68.8%
Age	Below 35	1	6.3%
	36–45	6	37.5%
	46–55	4	25.0%
	Older than 56	5	31.3%
Level of education	High School	0	0.0%
	Other	1	6.3%
	Bachelors	0	0.0%
	Master	5	31.3%
	PhD	10	62.5%
Discipline	Natural Science	2	12.5%
	Engineering	2	12.5%
	Medicine or other medical or health specialization	1	6.3%
	Social Sciences	7	43.8%
	Public administration	0	0.0%
	Education	0	0.0%
	Business and Commerce	0	0.0%
	Other	3	18.8%
	No information	1	6.3%
Kind of organization	University	7	43.8%
	Research Institute	7	43.8%
	Government Organization	1	6.3%
	NGO	1	6.3%
	Financial institution	0	0.0%
	Firm	0	0.0%
	Business Association	0	0.0%
	Consulting	0	0.0%
	Other	0	0.0%

Q2: You were a member of the following developing country team

	%	#
Brazil	12.5	2
Cuba	6.3	1
China	18.8	3
South Africa	12.5	2
Tanzania	18.8	3
Uruguay	12.5	2
Vietnam	18.8	3
Answered questions	100	16
Sample: 16		

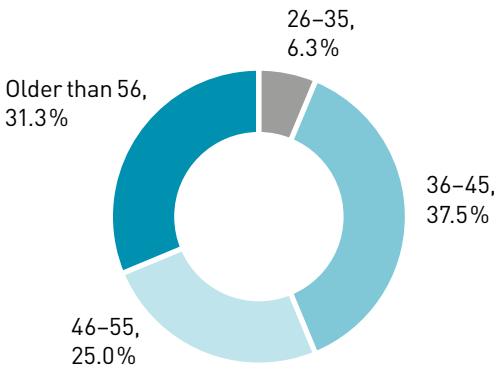


Q5: Gender

	%	#
Female	31.3	5
Male	68.8	11
Answered questions	100	16
Sample: 16		

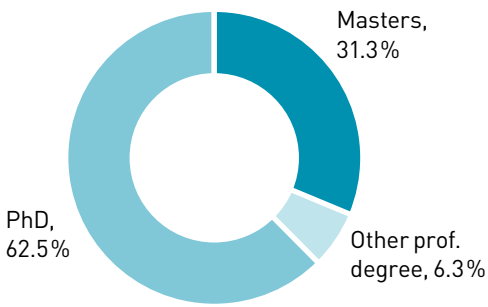
Q6: Age:

	%	#
26–35	6.3	1
36–45	37.5	6
46–55	25.0	4
Older than 56	31.3	5
Answered questions	100	16
Sample: 16		



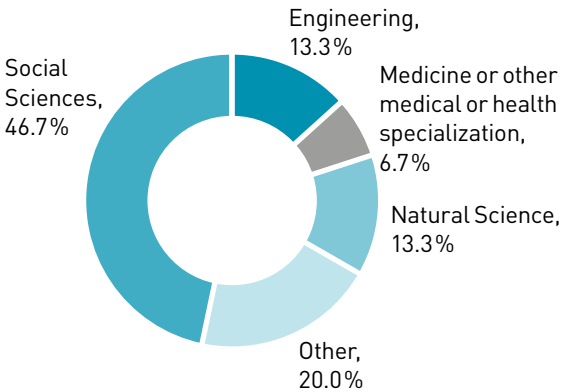
Q7: Your highest level of education is:

	%	#
Masters	31.3	5
Other prof. degree	6.3	1
PhD	62.5	10
Answered questions	100	16
Sample: 16		



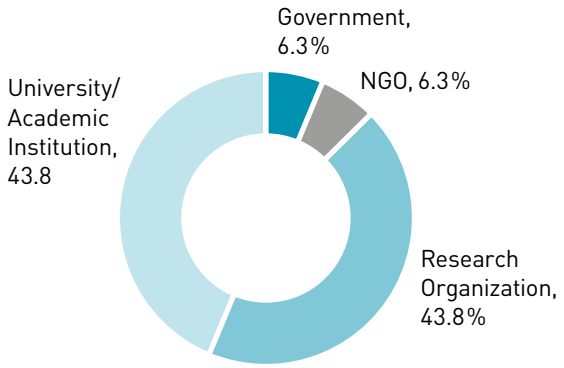
Q8: Discipline:

	%	#
Engineering	13.3	2
Medicine or other medical or health specialization	6.7	1
Natural Science	13.3	2
Other	20.0	3
Social Sciences	46.7	7
Answered questions	100	15
Sample: 16		



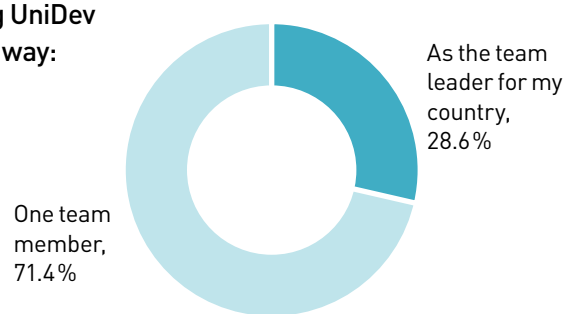
Q9: Your primary employment now is in:

	%	#
Government	6.3	1
NGO	6.3	1
Research Organization	43.8	7
University/Academic Institution	43.8	7
Answered questions	100	16
Sample: 16		



Q13: I participated in the following UniDev Research Project in the following way:

	%	#
As the team leader for my country	28.6	4
One team member	71.4	10
Answered questions	100	14
Sample: 16		



Q14: What led you to join the UniDev Research network?

Personal interest

The importance of the topic (Brazil)

Participating in the UniDev project (China)

Interest in the role of university in society (Tanzania)

My interest in innovation, and my interest in seeing my university become closer and more relevant to society. (Tanzania)

Network building

The contact with the team leader of project (Cuba)

I have been involved in research on the transition of university systems for some time. Rodrigo Arocena (a co-leader of the Uruguayan team) and I used the term "developmental university" as an alternative to the concept of "entrepreneurial university", at least in the sense in which this concept has been proposed lately. In particular, in the Universidad de la República we are working on new ways of understanding the "third mission" of the university. Joining the UniDev Research network was a very good opportunity to learn from others and to discuss those issues. (Uruguay)

My research in similar topics, previous collaboration with other members in the network. (Vietnam)

Invitations and representations

The team leader is my colleague, he asked me to join the team. (China)

Being as Associate of IERI (South Africa)

Invitation from the Organizers at RPI (South Africa)

I participated in the Biotechnology Project (Tanzania)

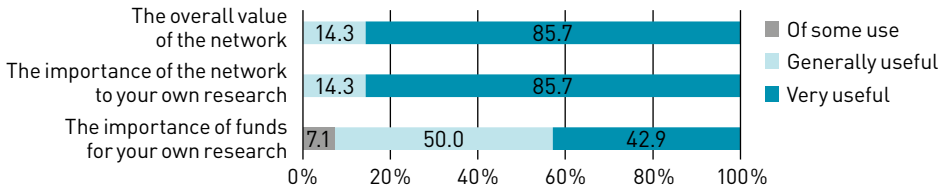
I was invited by the country coordinators (Urugua)

Q15: What were your motives for participation?

	Not Relevant		Relevant		Important		Very important		N/A		Answered questions
	%	#	%	#	%	#	%	#	%	#	
Importance of the topic					14.3	2	85.7	12			14
Networking research opportunity					28.6	4	71.4	10			14
Learn more about Innovation Systems and Universities					28.6	4	71.4	10			14
Present my own research to peers			21.4	3	64.3	9	14.3	2			14
Obtain feedback to improve my research output			7.1	1	35.7	5	50.0	7	7.1	1	14
Availability of Research Funds	7.1	1	21.4	3	57.1	8	14.3	2			14

Q16: Please rate the following:

	Of some use		Generally useful		Very useful		Answered questions
	%	#	%	#	%	#	
The importance of funds for your own research	7.1	1	50.0	7	42.9	6	14
The importance of the network to your own research			14.3	2	85.7	12	14
The overall value of the network			14.3	2	85.7	12	14



Q17: The project design allowed for a number of meetings of the network. Please rate their importance:

	Important for project results		Important for feed back		Important for dissemination	
	%	#	%	#	%	#
Three regular UNIDEV meetings	34.5	10	34.5	10	31.0	9
Four Globelics Conferences	18.8	3	31.3	5	50.0	8
Two International Conferences on Higher Education	18.2	4	31.8	7	50.0	11

Q18: Please rate the following in their importance for you in the UNIDEV network:

	Not important		Useful		Very useful		Most important		Answered questions
	%	#	%	#	%	#	%	#	
New ideas from others					57.1	8	42.9	6	14
Feed-back on my own work			21.4	3	57.1	8	21.4	3	14
Networking leading to new connections with scholars			7.1	1	21.4	3	71.4	10	14
The travel grant for your participation	7.1	1	21.4	3	42.9	6	28.6	4	14

Q19: Do you have any suggestions for the organization of future UniDev-project including suggestions for activities and themes that could be reduced or expanded?

Time

More time and previous meetings for project definition (Brazil)

This is an important project, it should be sustained (Tanzania)

New themes

I like to be including the theme of science and technology policies in the universities (Cuba)

I only participated in the Biotechnology activities so I cannot comment much on other UniDev-Project activities/themes. However, given the importance of Biotechnology in the developing world it would be important for Unidev to consider investing again in Biotechnology related research activities. (Tanzania)

It would be really useful to have a new UniDev project. The former UniDev project was able to combine particularly well a common framework of work with quite a lot of freedom in the way each national team organized the research at home. It would be good if questions that were not tackled in the former UniDev, plus new questions that the project highlighted, could be addressed in a new project. There are several important issues that could be usefully tackled through the UniDev network: i) Universities' answers to changes in innovation theory and practice (for instance, the proposals made by the Sussex New Manifesto, June 2010) centered around a direct relationship between research and innovation and the betterment of the quality of life of marginalized populations. ii) The academic reward or evaluation system (alternatives, challenges, implementation) iii) Going further on in the relationship between universities and development processes iv) The structural weakness of knowledge demand in developing countries and the role that universities could play to enhance such demand (Uruguay)

We should explore the topics of innovation in developing country context and the supporting role of universities. Via UniDev project we found a great potential in this direction. (Vietnam)

The conditions for successful catching-up based on a technology strategy should be examined in more detail (Vietnam)

Participation

Having covered the 14 Countries, expanding geographically and thematically provides many opportunities for deepening research insights, widening engagement with policy opportunities and

encouraging increased participation. With 'austerity' following the public financing of private-sector bailout now even threatening the established and more mature systems, the need for the continuation of UniDev is even more cogent. (South Africa)

Include more of the least developed countries for meaningful comparison between these countries and other more developed countries (Tanzania)

It would be interesting to have a second phase and expand the list of countries. (Uruguay)

In my opinion, the research should be expanded,, the research activities and results will brings great influences on the research attitude and development for the universities in developing countries. (Vietnam)

Q20: Your University (for China please use "universities in your country) is engaged in the following missions:

Brazil:

- Primary Mission of Education
- Second Mission of Research and Knowledge Generation
- Third Mission of Use of Knowledge for Economic Development through mechanisms below
- And/or – Industry Contracts
- And/or – Public Contracts
- Policy making support/studies
- Technology transfer/Clusters
- Social and cultural links

Cuba:

- Primary Mission of Education
- Second Mission of Research and Knowledge Generation
- Third Mission of Use of Knowledge for Economic Development through mechanisms below
- Policy making support/studies
- Social and cultural links

China:

- Primary Mission of Education
- Second Mission of Research and Knowledge Generation
- Third Mission of Use of Knowledge for Economic Development through mechanisms below
- Specifically – Science/industry parks
- And/or – Spin offs

- And/or – Industry Contracts
- And/or – Public Contracts
- Policy making support/studies
- Technology transfer/Clusters
- Social and cultural links

South Africa:

- Primary Mission of Education
- Second Mission of Research and Knowledge Generation
- Third Mission of Use of Knowledge for Economic Development through mechanisms below
- And/or – Spin offs
- And/or – Industry Contracts
- And/or – Public Contracts
- Policy making support/studies
- Technology transfer/Clusters
- Social and cultural links

Tanzania:

- Primary Mission of Education
- Second Mission of Research and Knowledge Generation
- Third Mission of Use of Knowledge for Economic Development through mechanisms below
- And/or – Public Contracts
- Policy making support/studies
- Technology transfer/Clusters
- Social and cultural links

* Specifically – Science/industry parks (*)
* And/or – Spin offs (*)
* And/or – Industry Contracts (*)

(*) at these issues some respondents of this country express Yes, and some express No.

Uruguay:

- Primary Mission of Education
- Second Mission of Research and Knowledge Generation
- Third Mission of Use of Knowledge for Economic Development through mechanisms below
- And/or – Industry Contracts
- And/or – Public Contracts
- Policy making support/studies
- Technology transfer/Clusters

- Social and cultural links

* Specifically – Science/industry parks (*)

* And/or – Spin offs (*)

(*) at these issues some respondents of this country express Yes, and some express No.

Vietnam:

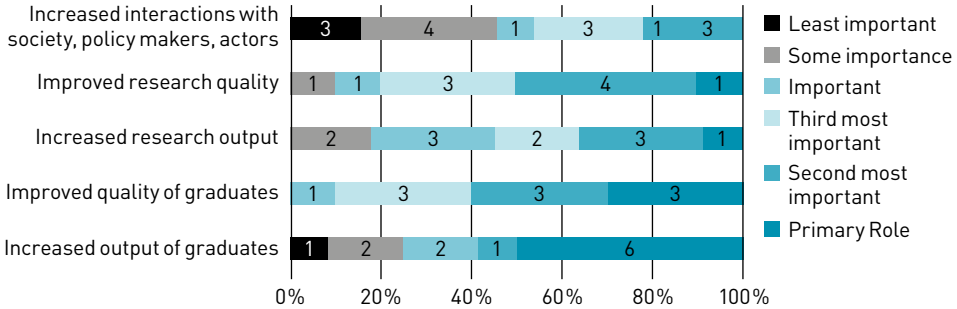
- Primary Mission of Education
- Second Mission of Research and Knowledge Generation
- Third Mission of Use of Knowledge for Economic Development through mechanisms below
- Specifically – Science/industry parks
- And/or – Spin offs
- And/or – Industry Contracts
- And/or – Public Contracts
- Technology transfer/Clusters
- Social and cultural links

* Policy making support/studies (*)

(*) on this issue some respondents of this country express Yes and some express No.

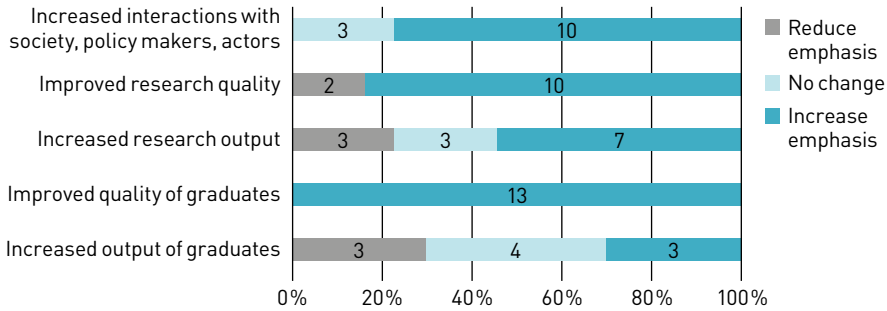
Q21: At my University (country) the ranking of current priorities is towards

	Least important	Some importance	Important	Third most important	Second most important	Primary Role	Answered questions
Increased output of graduates	1	2	2		1	6	12
Improved quality of graduates			1	3	3	3	10
Increased research output		2	3	2	3	1	11
Improved research quality		1	1	3	4	1	10
Increased interactions with society, policy makers, firms and economic actors	2	4	1	3	1	2	13



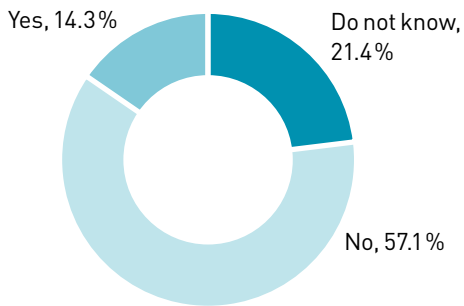
Q22: Based on your research findings, within the existing resources available, your university should:

	Reduce emphasis	No change	Increase emphasis	Answered question
Increased output of graduates	3	4	3	10
Improved quality of graduates			13	13
Increased research output	3	3	7	13
Improved research quality	2		10	12
Increased interactions with society, policy makers, actors		3	10	13



Q23: At your University (country in China) resources available are increasing faster than the outputs of graduates thereby making additional resources available for all three missions:

	%	#
Do not know	21.4	3
No	57.1	8
Yes	14.3	2
Answered questions	100	14
Sample: 16		



Q24: The additional resources available and efforts should be allocated with the following priorities (must add to 100)

	Increased output of graduates	Improved quality of graduates	Increased research output	Improved research quality	Increased interactions with society, policy makers, firms and economic actors
Brazil					
R1	10%	30%	20%	30%	10%
R2	.	.	.	.	.
China					
R1	30%	10%	30%	20%	10%
R2	.	.	.	.	.
R3	10%	30%	10%	30%	20%
Cuba					
R1	.	10%	10%	30%	50%
South Africa					
R1	.	.	.	.	.
R2	30%	30%	10%	20%	10%
Tanzania					
R1	10%	100%	20%	100%	100%
R2	10%	40%	10%	20%	20%
R3	20%	20%	20%	20%	20%
Uruguay					
R1	.	40%	.	30%	30%
R2	20%	30%	10%	20%	20%
Vietnam					
R1	10%	40%	0	30%	20%
R2	30%	30%	10%	10%	20%
R3	30%	10%	20%	10%	10%

* First row in Tanzania is not an error of the table, is the answer of the respondent (10 %, 100 %, 20 %, 100 %, 100 %)

Q25: What national policies are required to increase the contributions of knowledge to social and economic progress (up to 3 suggestions):

Public sector

Thinking in terms of Brazil, a large country, regional/state/municipality policies are more relevant than national ones; the ability to combine existing knowledge should deserve more attention, instead of putting all eggs in radical innovations (Brazil)

Abandon neo-liberal blind-faith neo-classical fundamentalist macroeconomic policy. Shift to evidence-informed evolutionary good practices orientated towards socio-economic rights and environmental sustainability. Shape Theory from Facts! (South Africa)

Have an institutionalized mechanism to connect socio/economic needs to research agendas; survey of productive sector demands for better understanding their needs; public procurement around some key areas (Uruguay)

Using research results as an important source of input for social and economic action plant and process (Vietnam)

S&T Policies

(1) Modify approaches, priorities, management styles and other instruments contributing to the integration. (2) The research oriented towards innovation in the university needs more institutional, stable and sufficient legal bases: incentives, financing mechanisms, channels for the commercialization, among others. (3) The national Science and Technology Policy require better institutional policies tending to mobilize the consent of numerous actors of knowledge institutions and other key actors in innovation process. (Cuba)

Intellectual Property Policy (China)

Science and technology (Tanzania)

National Innovation Policy; University-Industry Policy; National Cluster Development Policy (Tanzania)

1. To direct the governmental technology procurement towards national knowledge providers 2. To conceive all public policies, partly, as a knowledge policies, to maximize the linkages between knowledge needs on the part of public policies (from environment to health, from energy to nutrition, from domestic violence to education) and the capacities to find answers to such needs. 3. To have knowledge and innovation policies not directed narrowly to the short term but strategically oriented to development (development, and not only economic growth or economic development) (Uruguay)

Innovation Policy Public Finance for R&D and Innovation Education policy (Vietnam)

Universities

Increase the importance of improving the quality of graduates (China)

Improve linkage between The university and society -emphasis on demand side innovation policies (Tanzania)

Improve quality of teaching, increase number of university staff, introduce a broader set of evaluation criteria (Vietnam)

Q26: What role do you see for Sida in particular, (and other development partners, if relevant) to support the enhancement of innovation systems, and, the missions of the University in your country to increase the contributions of knowledge to social and economic progress (up to 3 suggestions):

Continue:

Continue to work in networking fashion, network of individuals or organizations; agglomeration. Innovation under a concept appropriated to developing countries. (Brazil)

Very important role to support and to promote research of innovation system. (Cuba)

A critical partner who fosters mutual and cooperative learning, competence-building and innovation. (South Africa)

Sida has played important roles in educating a lot of Vietnamese researchers in both formal education and practice. Sida also helped Vietnamese research to broaden research attitude. (Vietnam)

Increase:

Increase the investment in developing countries (China)

Financing a especial research project on Chinese innovation system is a good way (China)

Increase funding for innovation policy studies. To take correct actions one need evidence (Tanzania)

Provide addition funding to disseminate the results of the previous phases Technical support to ensure institutionalization of Innovation systems approach in our R&D Institutions (Tanzania)

Provision of funds; Facilitation of networks; Lobby for similar support from other development partners (Tanzania)

Sida and other donors have a key role to play, first by supporting research that shows what are the gaps and potential solutions in the field, second to foster the engagement of the policy community in this research area, and third, by contributing to the better research to policy link (Uruguay)

1. To promote a think-tank on innovation systems and universities from which some general guidelines for future research can be developed. 2. To foster a line of research on knowledge and development, pointing to a better understanding of this issue, that has been banalized by too narrow-minded and simplistic economic approaches. 3. To start, eventually with other partners (for instance IDRC and some regional and national agencies or teams), a research effort to explore ways for better connecting university research

and pressing social needs. This can seem to be a simple issue, but experience with a concrete university policy in Uruguay, conducted since 2008, shows that it is a quite difficult endeavor. (Uruguay)

Put priority to fund projects which try to design the appropriate innovation systems for specific need. (Vietnam)

Support the technical equipment of the engineering departments (Vietnam)

Q27: Better understand the research and policy issues related to innovation systems and the role of the University

	%	#
No	0.0	0
Yes	100.0	13
Answered questions	100	13
Sample: 16		

If yes, please explain specifically how

By a process of learning the experience of others countries (Brazil)

Know what relevant policies made in other countries (China)

Details of the evolutionary history help frame current continuities and changes in the political economy and thereby inform the NSI. (South Africa)

Have now known some additional facts about the place of university in the NSI system because of pilot survey carried out. (Tanzania)

Through the various fora and interaction with other members of the project (Tanzania)

Related to the current role of universities, their reform challenges and processes and how this relates to innovation in the context of developing (Uruguay)

By making tenths of interviews, reading new literature and putting forwards new hypothesis to be tested, (Uruguay)

Having exposed to discussion with other members in the network with the various and diversified experience help me extend my knowledge in field. (Nguyen Vo Hung) (Vietnam)

The present development strategies are too much focused on basic needs (Vietnam)

Q28: Improve my research output, resulting in:

	No		Not relevant		Yes		Answered questions
	%	#	%	#	%	#	
Increased publications	0.0%	0	15.4%	2	84.6%	11	13
Better quality research	0.0%	0	0.0%		100.0%	12	12
Use of my research findings	9.1%	1	27.3%	3	63.6%	7	11

Explain

Directly by means of a special number of a journal dedicated to partial results of the UniDev project and by the publication of a book with final results of the project and indirectly by provide me ways to write about comparative experiences (Brazil)

By cooperation, I and my colleague published a paper on SPP (China)

The publication of the book will accelerate the utilization of the Project results. (South Africa)

We have published in international journal -have used the findings in other papers (Tanzania)

The biotechnology group wrote a Chapter in a textbook that will be published later (Tanzania)

For instance a special journal issue was published. (Uruguay)

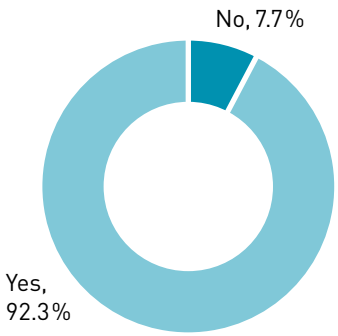
We published a book and several articles; we got new findings and we refined our views; we presented our findings in several meetings, at a national, regional and international level. (Uruguay)

I have two new publications base on my involvement in the Network Improve my skills on comparative study (Vietnam).

I am successful in generating results that helped to build up a new research line (Vietnam)

Q29: Advise governments or other users on improving innovation system issues/policies:

	%	#
No	7.7	1
Yes	92.3	12
Answered questions	100	13
Sample: 16		



If yes, please explain

Knowing better what worked or not elsewhere (Brazil)

Institutionalized role, function and responsibility (South Africa)

National feedback workshops (Tanzania)

We have advised government departments and research institutions to institutionalize innovation systems in their research methodologies (Tanzania)

Citing examples from other countries (Tanzania)

The country workshop counted on policymakers that then followed up on the research results. Furthermore, the country coordinators are involved in the university decision making and some actions have been taken based on the research results from the project (Uruguay)

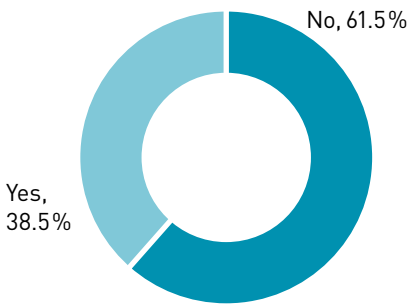
We got new arguments to back one of our main policy advices: to conceive and design innovation policies as social policies and the other way around. (Uruguay)

Give lecture on analyzing and designing innovation systems for policy makers, indirectly involve in drafting innovation policy in my country (Vietnam)

I could organize a meeting with relevant representatives from government organizations. (Vietnam)

Q30: Changed my research orientation on knowledge, innovation and development:

	%	#
No	61.5	8
Yes	38.5	5
Answered questions	100	13
Sample: 16		



If yes, please explain

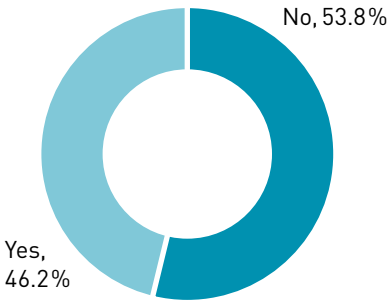
Enlarging the basic concepts relating to innovation (Brazil)

Appreciated the need innovations systems for enhancing sustainability of research projects (Tanzania)

I already worked in innovation. Now I learned about its relevance for development (Vietnam)

Q31: Learn how to adapt and use innovation ideas in my own work:

	%	#
No	53.8	7
Yes	46.2	6
Answered questions	100	13
Sample: 16		



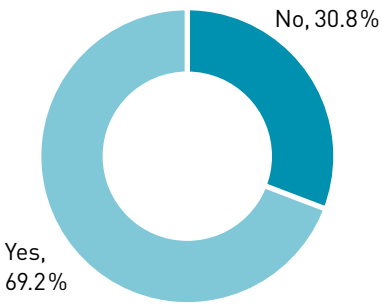
If yes, please explain

Comparative studies emphasized the particular over the generic often touted by multilaterals as the panacea for all ills. Much more to learn from patient explorations of differing contexts informing choice formation and decisions. (South Africa)

I have now adopted innovation systems approaches in my most of my research projects (Tanzania)

Q32: Increased my involvement in team and interdisciplinary work:

	%	#
No	30.8	4
Yes	69.2	9
Answered questions	100	13
Sample: 16		



If yes, please explain

Whilst still largely focused on economics, more of the social and political dimensions forced a wider appreciation of the complementarities emergent from interdisciplinary. (South Africa)

I have realized the importance of team work and involvement of scientists of different disciplines. Currently I am a member of two consortia researching on Cassana and Sorghum. The two teams are made up of scientists from Ethiopia Tanzania, Uganda and Kenya working of value chain interventions of the two food crops. Involved in advising scientists on the developing good proposals and it is now mandatory to in research project developed two proposals on bio-tech. (Tanzania)

The team discussions and exchange were very rich and useful. (Uruguay)

The paper and chapter written with Claes Brundenius and Beng-Åke Lundvall was a good exercise on discussing ideas with new partners; new insights suggested the usefulness of contacting people working in different but connected issues, like those working on Sen's capabilities approach. (Uruguay)

The more you participate the more you learn how to cooperate. (Vietnam)

Q33: My participation and increased capacity could have been more effective if:

Funds

If funding can be sustained (China)

Securing a local funding partner would have boosted the domestic research effort. (South Africa)

If more resources for research were made available. The case study we conducted needs enlarging for firmer conclusions. (Tanzania)

There were more funds (Tanzania)

There was more funding for field studies (Vietnam)

Time

There was more time allocated to the biotech research (Tanzania)

We work together for a longer time (China)

We could have had a more "structural" project, in the sense of a longer project (even if not necessarily with too much more money). (Uruguay)

I have more time (Vietnam)

Other

Less obligations to my own university (Brazil)

Yes, because I Know more about the role of university in the National Innovation System (Cuba)

My participation at UniDev was not as country coordinator, thus my involvement was not steady. For instance my participation at workshops happened when the country coordinators were not able to participate. (Uruguay)

N/A (Vietnam)

Q34: The greatest difficulty you face in undertaking research on innovation systems are due to:

	Low		Significant		High		N/A		Answered questions
	%	#	%	#	%	#	%	#	
Lack of financial resources			38.5	5	61.5	8			13
Lack of time	23.1	3	53.8	7	7.7	1	15.4	2	13
Administrative demands	38.5	5	46.2	6	7.7	1	7.7	1	13
Lack of demand for such research	63.6	7	18.2	2			18.2	2	11
Lack of relevance for my country	54.5	6	9.1	1			36.4	4	11

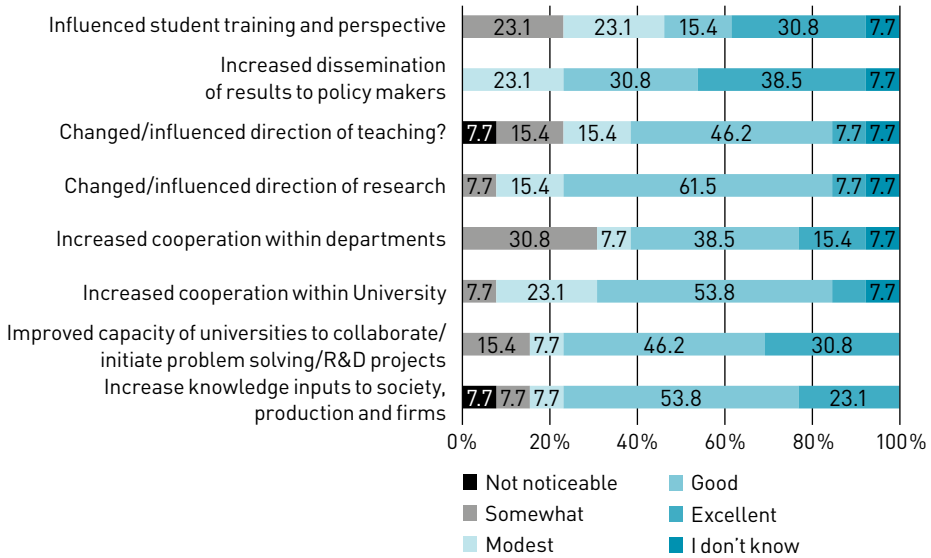
	Not noticeable		Somewhat		Modest		Good		Excellent		I don't know	
	%	#	%	#	%	#	%	#	%	#	%	#
Increase knowledge inputs to society, production and firms	7.7	1	7.7	1	7.7	1	53.8	7	23.1	3		
Improved capacity of universities to collaborate/initiate problem solving/ R&D projects			15.4	2	7.7	1	46.2	6	30.8	4		
Increased cooperation within University			7.7	1	23.1	3	53.8	7	7.7	1	7.7	1
Increased cooperation within departments			30.8	4	7.7	1	38.5	5	15.4	2	7.7	1
Changed/influenced direction of research			7.7	1	15.4	2	6l.5	8	7.7	1	7.7	1
Changed/influenced direction of teaching?	7.7	1	15.4	2	15.4	2	46.2	6	7.7	1	7.7	1
Increased dissemination of results to policy makers					23.1	3	30.8	4	38.5	5	7.7	1
Influenced student training and perspective			23.1	3	23.1	3	15.4	2	30.8	4	7.7	1

Other (please specify)

A specific theoretical framework that allow identifying the relevant issues to be studied. (Uruguay)

Lack of understanding of politicians (Vietnam)

Q35: Based on your own increased capacity, do you think, you were able to contribute:



Q36: In what ways the organization of UNIDEV project could have been improved to increase the benefits from interactions, the "use of knowledge about innovations" in your country and in the economy?

Workshops/Fora

Increase their presence at the national workshops (Brazil)

Can held a high-level forum in China (China)

Facilitation of national fora (Tanzania)

Research

To continue researches about the relationships among higher education, innovation and development. (Cuba)

The research to policy link needs further work, it is not specific to UniDev, but something that requires more explicit work (Uruguay)

Diffusion/impact

The organization of UNIDEV project contributes a lot of knowledge to the policy-makers (China)

Post book launch diffusion activities such as hosting regional panel discussions. (South Africa)

Increased time to disseminate the results; more resources allocated to capacity building (Tanzania)

Giving value information and method to brain wash to policy makers and managers who use directly intellectual labor (Vietnam)

Participation

Increase participation from least developed countries for meaningful comparison between and among economies. (Tanzania)

In addition to the funding of meetings and writing papers an improved funding for filed research would be helpful. (Vietnam)

No comments

I do not think that I can suggest much improvement in this regard. (Uruguay)

No comment (Vietnam)

Q37: Please provide comments on any other benefits you received and any other outcomes from your participation in UNIDEV:

Networking

More visibility at national context, recognition of leadership (Brazil)

The international cooperation for the high level formation and the scientific and technological research. (Cuba)

It is good for us to learn more from each other (China)

Know researchers from other countries, international communication can enable me to stand in the international research perspective (China)

Massive learning boost personally, institutional networking and global relevance. (South Africa)

Enlarge my network for scholars in the area of STI policy studies (Tanzania)

The most important benefit is the contact to other researchers in development policy (Vietnam)

Make a lot of friends, good funds! (Vietnam)

We could better "hammer" the idea of developmental universities, and use it to put forwards ideas and actions in the direction to a Second University Reform, and we discuss all this with the university students' organization. (Uruguay)

Learning

Increased knowledge on innovation systems approach. It has changed my approach as I am currently using ISA in all my research work (Tanzania)

Learning experiences from other colleagues from difference countries. (Vietnam)

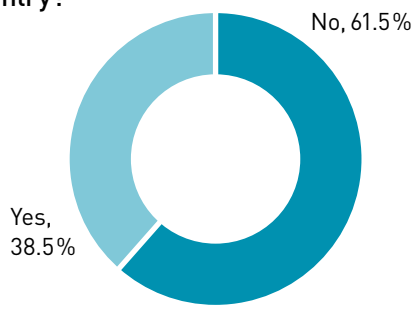
Positive test to my aspiration in respect of Academia for Society and Industry (Tanzania)

Other

My participation at UniDev was not as country coordinator, thus my involvement was not steady. For instance my participation at workshops happened when the country coordinators were not able to participate. (Uruguay)

Q38: Are you aware of any programs/projects that work with clusters and under the triple helix model of regional innovations in your country?

	%	#
No	61.5	8
Yes	38.5	5
Answered questions	100	13
Sample: 16		



If yes, please explain

There are projects being developed on Brazil with this regional character (Brazil)

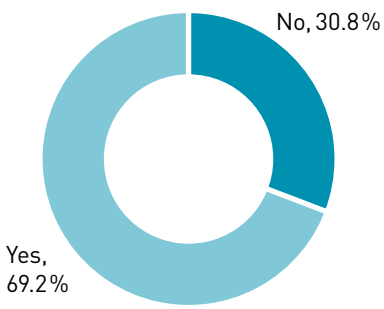
There are some such programs in my institute, CASTED (China)

ISCP-TZ (Tanzania)

Cluster Competitiveness (CCP) under the Tanzania Private Sector Foundation (Tanzania)

Q39: Are you aware of other programs/projects that work to increase linkage and networks between universities, research institutes, government and firms or other users?

	%	#
No	30.8	4
Yes	69.2	9
Answered questions	100	13
Sample: 16		



If yes, please explain

Some CYTED programs (Brazil)

There are some such programs in my institute CASTED, and I'm the team leader of some programs. (China)

ISCP-Tz, Bio-EARN, Incubator projects of UDSM and SIDO (Tanzania)

Bio innovate: work on increasing linkages and networks between institutions from Ethiopia, Kenya, Uganda and Tanzania ASARE-CA: work on increasing linkages and networks between institutions from 14 countries of East and Central Africa (Tanzania)

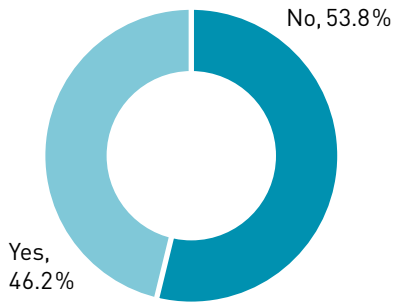
Athena Institute, Free University Amsterdam; Innogen, UK. (Uruguay)

This is a hot topic in policy discussion, many attempt have been tried out, but we don't have a well designed program (Vietnam)

There are various research projects on the national system of innovation (Vietnam)

Q40: Are you involved in or studied any triple helix/ cluster/ university-government-firms linkage?

	%	#
No	53.8	7
Yes	46.2	6
Answered questions	100	13
Sample: 16		



If yes, please explain

I was involved in a CYTED program called INNRED and I participated in studies developed at Amazonas State (Brazil)

I'm presiding over a number of related research financed by Chinese government. (China)

Several, including my PhD thesis on "Inter-organizational Linkages and Innovativeness in Least Developed Countries: The Case of the Tanzanian Metal Sector". Involvement of Universities seems only visible if firms can move up the innovation capability ladder; but then this is a major challenge. (Tanzania)

ISCP-EA and PACF (Tanzania)

Yes, in the biotech field. (Uruguay)

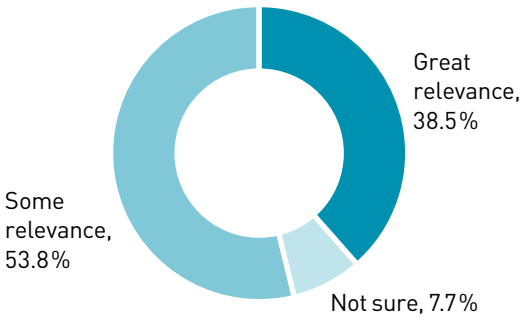
I do not work with the triple helix approach. I have worked extensively on university-industry-government linkages; I am leading now

a new project between the university, the organization of industrial entrepreneurs and the Ministry of Industry to develop the first survey on technological needs and demands in the Uruguayan industry. (Uruguay)

I participate in some research projects in this topic in my country (Vietnam)

Q41: Based on your knowledge, would you rate the triple helix approach, to be important for your country to support increased innovations for development?

	%	#
Great relevance	38.5	5
Not sure	7.7	1
Some relevance	53.8	7
Answered questions	100	13
Sample: 16		



Q42: Is there any specific action you recommend in your country to increase innovation for development?

Studies

A systematic study of the scientific policies, the innovation systems and also the role of higher education within them; 2. Cuba is an excellent laboratory to continue exploring the relationships among higher education, innovation and development, mainly in the context of the current process of universalization of higher education and in the perspective of local development, both newly approached issues in the country; 3. In order to research in that field we have created a National Research Program, very well articulated to the policy makers. It tries to answer the queries formulated before, whose advances and results will be interesting to share with the UniDev colleagues. (Cuba)

Make an overall survey on the need of enterprises, universities and research institutes to increase innovation. (China)

Capacity building

Reinforce entrepreneurship; reduce bureaucracy (Brazil)

We should build some technological poles in China. (China)

The approach is relatively new so investment in capacity building is critical (Tanzania)

Develop, establish and promote technology parks, incubators and innovation centers (Tanzania)

Policies

More explicit policies and connections between the research and policy communities (Uruguay)

Ending the hegemony of neo-classical fundamentalists in the national treasuries across the world. (South Africa)

Yes! emphasis on demand side innovation policies such as public procurement rather supply side innovation policy (Tanzania)

We should work more on eliminating the obstacles of innovation rather than just try to promote it. Reduce drag is more efficient than increase propel in this case (just like swimming!) (Vietnam)

Increase the availability of graduates in engineering (Vietnam)

In case of Vietnam, I thought that if we can encourage knowledge from using and applying perspective, that could increase the innovation rate faster (Vietnam)

11 Research network: Globelics

BACKGROUND

Globelics is short for The Global Network for Economics of Learning, Innovation and Competence building Systems.[143]

The ideas that animate Globelics were first formally articulated in preparatory workshop held in Denmark, in November 2002, and supported by a first analysis and paper.[144]

The basic objective of Globelics was to create a global network of scholars who apply the concept 'systems of innovation and competence building' as their analytical framework.[145] The network could then share information and experiences about knowledge development worldwide on methods, analytical results and policy relevant experiences among senior scholars. It was hoped to provide a "cooking pot", of new ideas, thoughts and research and policy proposals, and also be of benefit to PhD-students. The objective also was for research that would influence policy making in – industrial policy, innovation policy, regional policy, labour market policy and education policy and the management of knowledge and innovation at the firm level.

The reasons behind it stated by the organisers, include the growing gap in the resources and knowledge available to scholars in different regions; the need for more integrated and network research activities in the social sciences; and the need to have a global

[143] This section on Globelics is prepared by Amitav Rath based on documents listed and interviews and supplemented by the survey of participants in the Globelics network. The survey was designed by the evaluation team and managed by Mario Bazán and Fernando Prada Mendoza, FORO. The survey results are provided at the end of the chapter. The comments are as provided by the respondents and while some of them are used in this assessment, they are of most benefit to the members of the network in their future plans.

[144] The preparatory workshop was held in Denmark, 4–5 November 2002 and the background paper is, Lundvall, BÅ. and Soete, L. 2002. GLOBELICS: Global network for Economics of Learning, Innovation and Competence building Systems.

[145] Summary from Globelics web site and documents. For more information see: www.globelics.org

perspective. It argued that the literature on "national" systems of innovations has been valuable in highlighting the role of the state and its institutions in national competence building and this needs to be broadened to incorporate the issues of rapid globalisation and resultant pressures.

The organisers of Globelics believed that any improvements in understanding about innovation systems and the policy influence of the knowledge can be more important for poorer countries of the South to build their innovation and competence building systems. The analytical approaches of Globelics are inspired by the Economics of knowledge and innovation; Development economics and economic geography; International business studies and organisation theory; and on learning, and competence building in labour markets and in education systems.

Globelics was established as a global network, principally connected through regular annual conferences and Ph.D. courses and electronic means. It brought together a network of leading European research institutions linked to regional nodes. It began with two persons, Bengt-Åke Lundvall and Luc Soete providing the initial leadership and oversight of the network and training academies rests on a Scientific Board, with 20 senior scholars from 17 countries, both developed and developing but no one from the low income countries.

ACTIVITIES:

Globelics has successfully organised 8 annual conferences bringing together senior scholars and Ph.D. students, starting in 2003.
A regional Asialics Conference was begun in 2004 and has organised annual conferences; several Ph.D. training schools on National Systems of Innovation and Economic Development have been organized.

Among the activities of Globelics are:

8th Globelics International Conference, KL October/Nov 2010

The 7th Globelics International Conference, Dakar, 6–8 October 2009:

The 6th Asialics International Conference, Hong Kong, 6–7 July 2009:

The 6th Globelics International Conference, Mexico City, 22–24 September 2008:

The 5th Asialics International Conference, Bangalore, 2–4 April 2008

The 5th Globelics International Conference, Saratov, Russia, 20–23 September 2007 (250 participants):

The 4th Asialics International Conference, University of Malaya, Kuala Lumpur, 22–24 July 2007:

Ph. D.-School on National Systems of Innovation and Economic Development, 2–11 May 2007, Lisbon, Portugal:

Second International Workshop of the BRICS Project, 25–27 April 2007, Rio de Janeiro, Brazil:

The 4th Globelics International Conference, Trivandrum, Kerala, India, 4–7 October 2006 (300 participants):

The Third Globelics Academy, Lisbon, Portugal 02 May – 12 May 2006:

The Third Asialics International Conference, Tongji University, Shanghai, 16–19 April 2006:

The 1st International Workshop for the BRICS Project, Aalborg, Denmark, 12–15 February, 2006:

The 3rd Globelics International Conference, Pretoria, South Africa, 31 October – 4 November 2005 (200 participants):

The First Cicalics Academy, Beijing, China, 3–11 September 2005:

Launch of the 'Catch-up Project' at the Earth Institute, Columbia University, 13–15 May 2005.

The Second Globelics Academy, Lisbon, Portugal 23 May – 3 June 2005:

The Second Asialics International Conference, Jeju Island, Korea, 17–19 April 2005:

The Second International Globelics Conference, Beijing, 16–20 October 2004 (200 participants):

The First Globelics Academy, Lisbon, Portugal 25 May – 4 June 2004:

The First AsiaLics International Conference, Bangkok 1–2 April 2004:

The First International Globelics Conference, Rio de Janeiro, 2–6 November 2003 (400 participants):

Workshop in Bangkok on Globalisation of National Innovation Systems, co-organised by KMUTT, NSTDA, JICA, and the Danish Government, June 2003

Sida provided support for the participation of PhD students and scholars from developing countries from its global and regional programs. Globelics proved highly relevant to the Sida exploration on building research competencies on innovation and the relationship

between university and society. The results are expected to contribute to capacity building that can promote 'systems of innovation and competence building' and improve policy in partner countries and also contribute to the larger development goals.

ASSESSMENT

The assessments are based mostly on a review of the activities, outputs from documents and the very positive results from the survey of participants from developing countries. See the complete survey results below.

Relevance: The intervention is highly relevant as per the needs and priorities of the research participants and the policies of recipient countries and donors to increase capacity. This follows from the theory discussed earlier and the feedback of participants.

Effectiveness: The intervention has been highly effective in building capacity, sharing of information and experiences about developments on methods, analytical results and policy relevant experiences on innovations, created a strong network of senior and young researchers. It has generated new ideas, research and policy proposals, and has been very valuable to PhD-students.

Impact: Beyond the capacity increase among the individual participants in terms of their knowledge and ability to undertake higher quality research and network with global knowledge, almost half and more of the respondents mention direct participation in policy advice; in use in further training of students; in providing the knowledge gained to users of different kinds.

It also assisted to the knowledge of and gained from the research of the UNIDEV network and from the participation of several researchers involved in the five national project. This degree of linkage between separately funded Sida projects is to be commended and modelled in other Sida funded activities.

Sustainability: Defined as the continuation of the activity after the cessation of the Sida development assistance is considered very high. This is based on the fact that the continuation of the network activities and benefits have not depended solely on Sida financial support, and to the extent Globelics has multiple sources of support, it has achieved a high degree of sustainability.

Efficiency: The small annual contribution of Sida for the participation of researchers from developing countries has been a highly

efficient intervention. There are almost no alternatives that come to mind that could achieve similar impacts for the costs incurred.

The rating for this would be outstanding on all counts, with few or no significant shortcomings were found.

A speculative thought for the organizers and Sida to consider would be whether additional pointers from the innovation models could have been adopted to make this set of activities even more effective? Two responses strike the author – given that Globelics was meant to be interdisciplinary, but dominated by social scientists of various disciplines, there could have been benefits of introducing a greater number of scientists and engineers to the conference. Similarly, additional beneficiaries of Sida support in low income countries, such as the cluster projects, BIOEARN, and others, the many bilateral university and research council capacity building projects, could have been invited to Globelics.[146] The innovation systems ideas, summarized in the Main Report, suggest that the linking users with researchers, very directly, and to share and solve specific issues of working in the cluster concepts, or promoting innovations in biotechnology would have been of mutual benefit. We underline our view that such expansion cannot be carried out beyond some carefully determined limits on the diversity of participants as well as numbers at one event. But the possibility of building additional experiments that could increase relevant network connections and apply the fundamental ideas of "learning by doing" should be explored carefully as Globelics moves forward.

SURVEY

The electronic survey was sent to a database of a total of 205 people from developing countries that participated in any of the eight Globelics Conferences held since 2003. The survey was open between December 9 and December 17, 2010. A total of 121 persons (59.0 %), answered the survey. This provides for strong confidence in the quantitative findings. The commments of participants are provided almost always in their own words except for minor editing where appropriate.

The respondents come from thirty different developing countries: Argentina, Bangladesh, Brazil, Cameroun, China, Colombia, Costa

[146] It is noted that some of the participants in the Globelics conferences were also involved in some of the other cases in this portfolio. Such interactions could have been deeper and more systematic.

Rica, Cote d'Ivoire, El Salvador, Hungary, India, Kazakhstan, Lesotho, Malaysia, Mauritius, Mexico, Nigeria, Pakistan, Philippines, Russia, Rwanda, Senegal, South Africa, South Korea, Sudan, Turkey, Uganda, Uruguay, and Vietnam. A few report that they come from a developed country, but when re-checked most were from a developing country, who answered the surey while living in a developed country for training, conference or other reasons.

A majority (62.8 %) were men. The age distribution of respondents was 43.8 % between 26 and 35 years old and 36.4 % between 36 and 45 years old respectively, with the others older. Almost all respondents have a PhD or Masters degree - 65.3 % and 32.2 % respectively) and a majority are from the social sciences (63.1 %). Most,(59.5 %) work at a university or academic institution and 24.8 % in a research organization.

Table 11.1: Respondents to the survey on the Sida's Strategic Evaluation of Innovation System for Globelics conferences

		#	%
# people that received the survey		205	
Total respondents		121	59.0%
Gender	Female	45	37.2%
	Male	76	62.8%
Age	Below 35	54	44.6%
	36–45	44	36.4%
	46–55	19	15.7%
	Older than 56	4	3.3%
Level of education	High School	0	0.0%
	Other	2	1.7%
	Bachelors	1	0.8%
	Master	39	32.2%
	PhD	79	65.3%
Discipline	Natural Science	2	1.7%
	Engineering	5	4.1%
	Medicine or other medical or health specialization	2	1.7%
	Social Sciences	80	66.1%
	Public administration	1	0.8%
	Education	2	1.7%
	Business and Commerce	9	7.4%

		#	%
	Other	13	10.7%
	No information	7	5.8%
Kind of organization	University	72	59.5%
	Research Institute	30	24.8%
	Government Organization	7	5.8%
	NGO	1	0.8%
	Financial institution	0	0.0%
	Firm	1	0.8%
	Business Association	0	0.0%
	Consulting	2	1.7%
	Other	8	6.6%

Q1: Contact information: Country

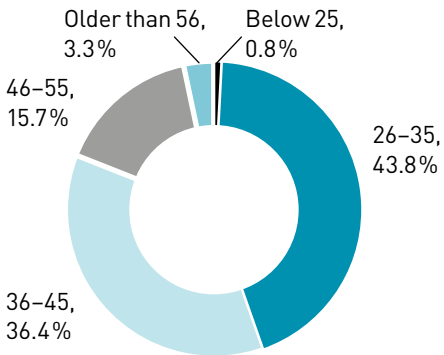
Argentina	9	(7.4%)	India	28	(23.1%)
Brazil	5	(4.1%)	China	8	(6.6%)
Colombia	1	(0.8%)	Pakistan	4	(3.3%)
Uruguay	1	(0.8%)	Malaysia	3	(2.5%)
Venezuela	1	(0.8%)	Vietnam	3	(2.5%)
Mexico	6	(5%)	Bangladesh	3	(2.5%)
Costa Rica	1	(0.8%)	Sri Lanka	2	(1.7%)
El Salvador	1	(0.8%)	Indonesia	1	(0.8%)
Nigeria	11	(9.1%)	Kazakhstan	1	(0.8%)
South Africa	6	(5%)	Philippines	1	(0.8%)
Cameroon	3	(2.5%)	Russia	4	(3.3%)
Uganda	2	(1.7%)	Belarus	3	(2.5%)
Cote d'Ivoire	1	(0.8%)	Turkey	2	(1.7%)
Lesotho	1	(0.8%)	Hungary	1	(0.8%)
Mauritius	1	(0.8%)	Romania	1	(0.8%)
Republic of Benin	1	(0.8%)	Others	2	(1.7%)
Rwanda	1	(0.8%)			
Senegal	1	(0.8%)			
Sudan	1	(0.8%)			

Q4: Gender

	#	%
Female	45	37.2
Male	76	62.8
Answered quest.	121	100
Sample: 121		

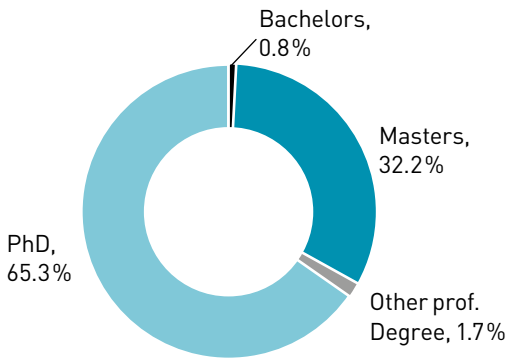
Q5: Age

	#	%
below 25	1	0.8
26–35	53	43.8
36–45	44	36.4
46–55	19	15.7
Older than 56	4	3.3
Answered quest.	121	100
Sample: 121		



Q6: Your education level is:

	#	%
Bachelors	1	0.8
Masters	39	32.2
Other prof. Degree	2	1.7
PhD	79	65.3
Answered quest.	121	100
Sample: 121		

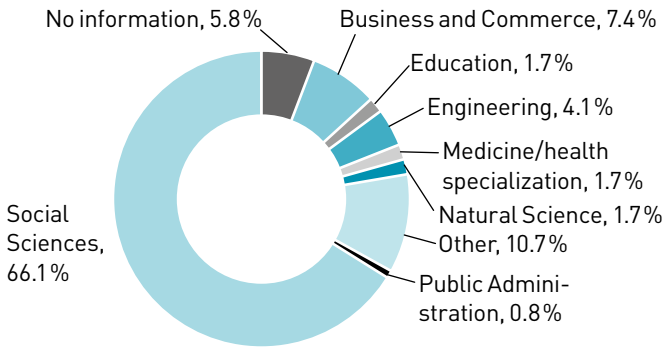


This answer considers the highest educational level reached, since many of them, marked more than one educational level.

Q7: Discipline: Choose one – Discipline (if relevant)

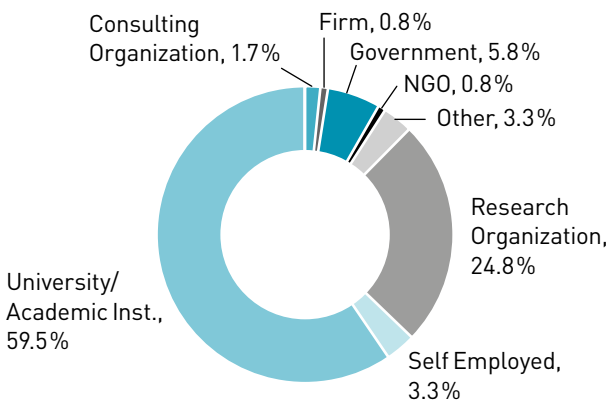
	#	%
No information	7	5.8
Business and Commerce	9	7.4
Education	2	1.7
Engineering	5	4.1
Medicine/health specialization	2	1.7
Natural Science	2	1.7

	#	%
Other	13	10.7
Public Administration	1	0.8
Social Sciences	80	66.1
Answered quest.	121	100
Sample: 121		



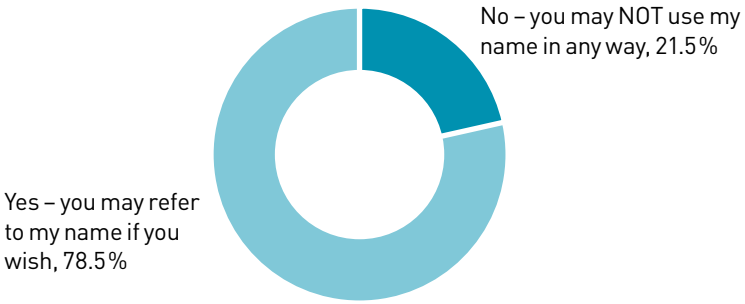
Q8: Your primary employment now is in:

	#	%
Consulting Organization	2	1.7
Firm	1	0.8
Government	7	5.8
NGO	1	0.8
Other	4	3.3
Research Organization	30	24.8
Self Employed	4	3.3
University/Academic Inst.	72	59.5
Answered quest.	121	100
Sample: 121		



Q9: Do you agree that your name can be referred to in any published reports?

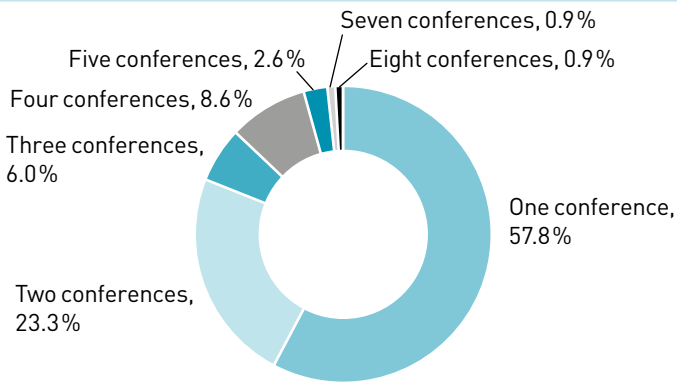
	#	%
No – you may NOT use my name in any way	26	21.5
Yes – you may refer to my name if you wish	95	78.5
Answered quest.	121	100
Sample: 121		



PARTICIPATION

Q12: I participated in the GLOBELICS Conference(s)

	#	%
One conference	67	57.8
Two conferences	27	23.3
Three conferences	7	6.0
Four conferences	10	8.6
Five conferences	3	2.6
Six conferences	–	–
Seven conferences	1	0.9
Eight conferences	1	0.9
Answered quest.	116	100
Sample: 121		



Q13. How did you learn about the Globelics Conference?

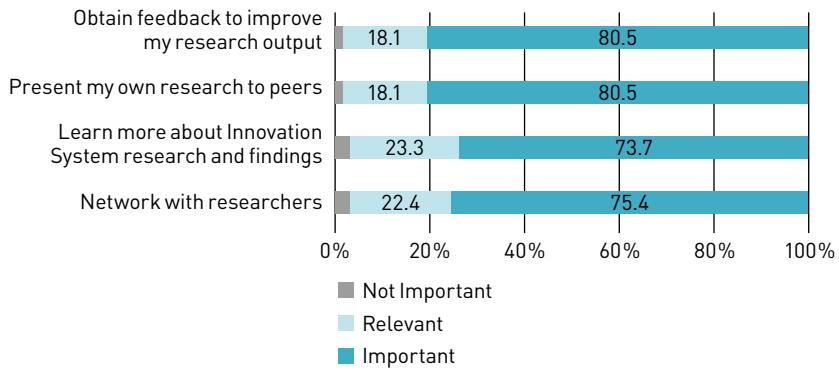
Internet-Website
From colleagues or friend
Globelics network
Participation in previous activities related to Globelics

Table 11.2: Type of participation in Globelics Conferences

	Present-ed paper	Chaired sessions	Review papers	Total
8th Globelics Conference, Kuala Lumpur, 2010	84	21	27	135
7th Globelics Conference, Dakar, 2009	41	8	12	61
6th Globelics Conference, Mexico City, 2008	33	15	14	62
5th Globelics Conference, Saratov, Russia, 2007	20	7	5	32
4th Globelics Conference, Trivandrum, India, 2006	19	5	8	32
3rd Globelics Conference, Pretoria, South Africa, 2005	8	4	5	17
2nd Globelics Conference, Beijing, China, 2004	6	5	4	15
1st Globelics Conference, Rio de Janeiro, 2003	2	0	0	2
Total	215	66	75	
Total answered questions: 116				

Q14: Your motives for participation include:

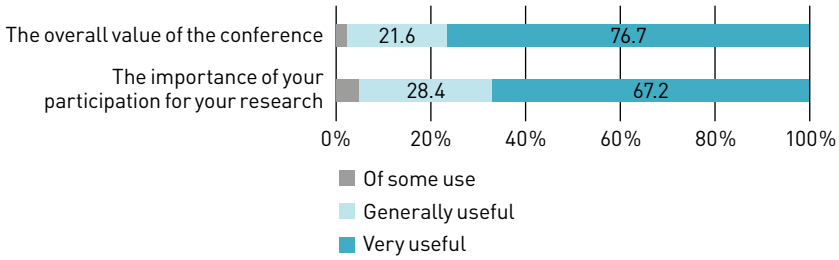
	Not Important		Relevant		Important		Answered questions
	#	%	#	%	#	%	
Network with researchers	3	2.6	26	22.4	87	75.4	106
Learn more about Innovation System research and findings	3	2.6	27	23.3	86	73.7	106
Present my own research to peers	2	1.7	21	18.1	93	80.5	106
Obtain feedback to improve my research output	2	1.7	21	18.1	93	80.5	106



IMPACT

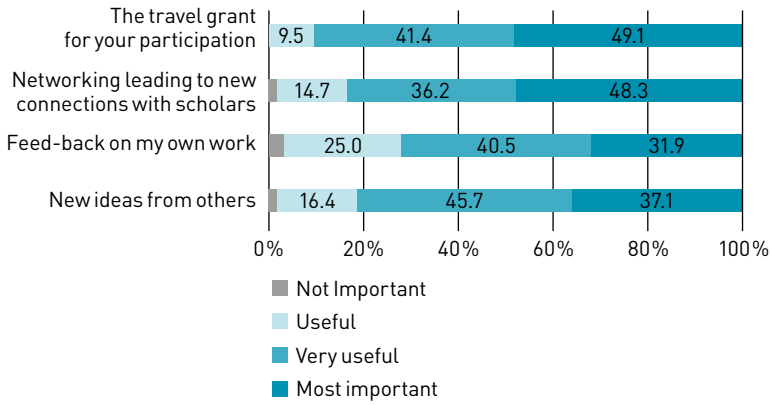
Q15: Please rate the following:

	Of some use		Generally useful		Very useful		Answered questions
	#	%	#	%	#	%	
The importance of your participation for your research	5	4.3	33	28.4	78	67.2	106
The overall value of the conference	2	1.7	25	21.6	89	76.7	106



Q16: Please rate the following achievements in their importance for you:

	Not important		Useful		Very useful		Most important		Answered questions
	#	%	#	%	#	%	#	%	
New ideas from others	1	0.9	19	16.4	53	45.7	43	37.1	106
Feed-back on my own work	3	2.6	29	25.0	47	40.5	37	31.9	106
Networking leading to new connections with scholars	1	0.9	17	14.7	42	36.2	56	48.3	106
The travel grant for your participation			11	9.5	48	41.4	57	49.1	106



ANNUAL CONFERENCE

Q17: Do you have any suggestions for the organization of future Globelics-conferences including suggestions for activities and themes that could be reduced or expanded?

General

No, at the moment I don't have, it is adequately comprehensive (22).

In my opinion the conference was perfectly organized and I cannot see any point that demands improvement.

The conference was very well organized.

No, everything was perfect.

No, I think they did a great job.

Studies-dissemination

Theoretical background of NIS study could be expanded.

My suggestion is that it would be very useful if the papers presented at Globelics conferences can be published in special issues of Journals and/or books.

More support for publishing the presented work.

As globelics is growing the need is for Decentralized Governance with sharing of responsibilities among new scholars.

The organization may team up with some journals/publication house for publishing the deserving conference papers.

Quality

Reduce the number of papers and male sure that each of the presenter's paper is well evaluated and the presenter's get a very good feed back of their work. Some of the papers presented were simply substandard. Not at all keeping up with the standard that was expected in a conference of this scale. Let there be better discussions on a particular topic and based on that let the conference come up with some policy suggestions and let conference abstract be with some bullet point suggestions derived from the papers presented there so that those looking forward to some ideas in these fields can quickly have an idea as to what options exists.

Reduce the number of sessions and papers.

Enhance the quality of papers selected.

The quality of some of the papers presented could be improved.

Number of papers and sessions can be reduced.

Review process should be much more rigorous.

Please try to improve the quality and participation in parallel session.

I would say reduced. Many papers are in incipient stages or of a low quality. Also 12 minutes for a presentation and no feedback from the audience (allowed) due to lack of time is very bad. So, less papers, better ones, and more discussion and feedback...so that everyone has something to gain of the conference.

Have less number of paper; make the refereeing process stricter improve the quality of panel discussions- fewer well focused panels-fewer number of panelists.

Increase the quality of the papers presented. More attention from the organizing committee during the parallel sessions (confirm that discussants and chairs will be present). More attention during the design of parallel sessions.

Improve the feedback for the papers.

Providing more time for each presenter to obtain more feedback and comment.

I like the streaming into themes; it lends coherence and aids discussion. I would like to see the system of respondents change – having more than one respondent does not facilitate critical debate and tends to fracture the sessions into a set of supervision sessions.

More rigorous screening required.

The important suggestion is please kindly make it sure that at least the Discussants are available mostly I felt that they were not present. This is one of the important to get feedback. -The discussants should be of the same field.

Regarding grouping papers for parallel sessions – proper care need to be taken to ensure correct papers are grouped together; otherwise presenter is found presenting in front of not very relevant audience.

Is it possible to choose best papers written by scholars?

I suggest that could be a kind of evaluation about the session chair and paper reviewer, and the worst evaluated maybe could be changed in next conferences.

Focus (topics, beneficiaries and geography)

More support for scholars and academics from developing countries especially the African countries.

Please promote any researches which apply innovation to real life.

Expand on theoretical discussions; focus on global challenges; attend to neglected areas of development like sustainability and social justice.

I think that macro to micro should be included as a topic.

Themes on agriculture should expanded.

More African delegates, more African in invited panel sessions.

There could be a greater focus on specific types of actors. I am particularly interested in the role of NGOs as innovation intermediaries in the South, but maybe also in the North (ex. green markets). The field visits were relevant and good to break up time spent on parallel and plenary sessions. In relation to Kuala Lumpur, relax the timing to give greater time for discussion. There was a more appropriate time schedule at Globelics Mexico.

I found these conferences are extremely useful for those researchers like me from developing countries not only from the networking and developing new connections with scholars but also stimulate new ideas for our research at home. I very much hope this initiative will continue to receiving support from Sida.

Health care

More widely to consider questions of state regulation and innovation financing.

Globelics may wish to consider as a future theme, impact of climate change on technology transfer.

I feel very happy that issues relating to technological change and development, poverty and inequality are being taken up. (I wish I could participate in these efforts!). I wish that greater emphasis were given to issues relating to globalization and technological change and more importantly how governments and corporate invest on new technology that leads to environmental preservation and a more equal distribution of income in an economy.

Commercialization of innovations. A lead through of conference is in Byelorussia.

Public-private partnership in innovation policy.

Should expand more on role of IP in innovation.

An important – potentially fruitful – research topic is missing from the Globelics agenda (and in general): comparative studies of former centrally planned economies and developing countries, e.g. the re-structuring/ evolution and performance of their innovation systems (national, sectoral, regional); their way to participate in global production and innovation systems (from a different angle: the

impact of FDI); policies of national governments and international organizations affecting the innovation systems and performance of these countries.

Theme should be expanded to innovation in agriculture technology for rural development Technical subjects must be given equal importance along with management innovation We need more presentations on innovative technology and applied research.

It is happy to see the inclusion of the theme related with agriculture, which I had already suggested in the conference held in Russia, Saratov, 2007 (5th Globelics).

More travel grant to scholars from developing countries.

More focus on S&T and innovation policy evaluation would be welcome.

I would suggest more sessions regarding management and organization for innovation.

The range of sessions topic-wise and the number of speakers incorporated was impressive. I think the conference catered to all the important sub-themes within innovation research.

If you may sure that the young scholars/researchers can get more and in details feedback from high scholars.

Time

The time to present the paper should be increased.

One major problem was the large number of parallel session, which indeed restricted from attending some important papers. This also reduced the number of audience in many sessions. This is really a disincentive especially for those who are coming from faraway places. In the future, please increase the number of days of conference so that it can be adjusted.

That such opportunities exist for researchers, is in itself very helpful. The parallel sessions often make you miss some very exciting and interesting paper presentations and discussions. It is extremely important that similar disciplines are not kept at the same time during conferences in parallel sessions.

Reduced

Expanded

Considerably reduce the number of presentations in order to allow for more time for each presentation, feedback and discussions.

Giving more time for presenter. The discussant of the paper should take take serious. Better travel support who is asking for it.

It would be interesting if there was more time to discuss the papers presented in the parallel sessions. Comments not only form the discussants but also from the audience are very important especially for those who present work-in-progress papers.

There was a very limited time allocated for each presenter so that everything seems to be in rush. Each presenter should be allocated more time to be more effective.

Give more time for each presentation and its comments.

Will be good have more time for discussion and not repeat plenary session with very well know senior scholars, but it is not easy to do.

The individual presentation time should be increased. The number of parallel sessions may be reduced so that there is sufficient attendance in all the sessions.

Papers

Number of accepted papers be increased.

Guidelines and length should be given for papers to be presented especially for the PhD paper competition.

Need to feature more development oriented papers in future conferences.

Administrative

"Les travaux doivent être plus spécifiques et plus concentrés sur un nombre de thèmes plus réduit. Le remboursement des frais de voyage doivent être totalement pris en charge et non à travers un montant forfaitaire fixé à l'avance" (original). (Approximate translation – The work should be more specific and focused on a smaller number of topics. Reimbursement of travel expenses should be on actual expenditures and not a lump sum fixed in advance.)

Bring in science-based researchers (e.g. from the basic or applied health sciences) into some of the plenary sessions. Reconsider the present policy of allowing grantees to buy tickets and get refund after conference. Five or more PhD students from Africa who were given travel grants could not attend the 8th Globelics because they could not raise the funds for air-ticket. This could have been avoided if the organizers had directly bought their air-tickets. Kindly procure air ticket for the participant upfront. Anyway, the next one is already fixed for Argentina next year.

I think that the theme discussed is very relevant. Maybe the theme must be expanded in order to cover most of the fields. I would

like to suggest it is possible to revise the process of grants delivery because it could be sometimes very difficult to prepay the air ticket.

Structure of the conference

It could be a good idea to organize a final session as an open debate to discuss the key issues derived from a summary of work done during the conference, regarding the problems of particular regions or countries.

Organized some group discussion.

The present organization is very effective and useful and the present themes are well designed to cover a broad scope of research. Some ideas are: In order to allow new participants to integrate with the network, a programmed guide with images of participants would be very useful. Another thought is that when the themes become very specific the opportunities for getting to know other relevant research become limited.

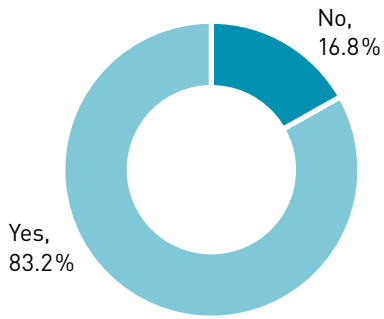
Continue the good work. Sessions on posters may also be introduced.

The parallel sessions should strive to ensure that every presented paper is given time for feedback and questions sessions. This is useful for us young researchers who are still learning most of the new concepts in innovation systems.

Could look for more collaborative and interdisciplinary themes as was the case in 8th Globelics conference. Maybe hold group discussion forums or workshops related to specific themes.

Q18: Better understand the research and policy issues related to innovation systems

	#	%
No	19	16.8
Yes	94	83.2
Answered quest.	113	100
Sample: 121		



If yes, please explain:

I listened a number of plenary sessions which improved my knowledge in the area. Similarly the papers presented by different authors also helped me.

As a young researcher, I learnt the importance of interacting and networking with researchers from other part of the globe.

Evolutionary and systems theory are far more now clear than they ever were when I read them through the books / research papers.

Interactions with the scholars working on variety of themes provided a wide exposure.

Several sectoral innovation system have been studied and analyzed since I first attended Globelics in 2006, my involvement gave me an edge to better understand and carry out the studies.

I learnt more the research and policy issues on innovation but try to apply to Africa issue is yet to be fine tune to me.

I obtain new knowledge by participating in panel discussion or specific theme during the conference.

This conference is especially good at linking specific innovation studies, with more general development issues, highlighting policy implications.

I have been participating in a number of projects and interacting very closely with Globelics scholars that has helped my learning process enormously.

Inter-countries linkage in innovation policies of countries.

I have been introduced to a new theoretical framework with which to address my work on higher education and to debate policy issues in South Africa.

Through the paper presentations.

It helped me bring those issues to my research which I thought were not that crucial, but at the end were among the most important one that made my findings robust and unique.

Participating in those conferences help me to update on the latest knowledge on the field of innovation. More important, it provided me opportunities to develop research cooperation with not only scholars from developed countries but also with those from developing countries.

From the panel sessions.

Case studies, new publications presented, learning about ongoing research projects, etc.

As the conference is located in different countries, policy makers participate and some plenaries deal with the country/region problems, I could learn about the policy problems that this country/region faces.

During the meeting and conversations.

Discussion questions and dialogue with colleagues.

Globelics is where people present about innovation. It is sure that my understanding about innovation is getting better.

My knowledge of technological progress and its relationship with total factor productivity is enhanced.

Get more information from scholars.

I learned a lot of innovative ideas from participants. and paper presented.

Hearing and interacting with persons doing frontier research in the area was very useful.

Access to the work of other colleagues at the frontiers of innovation policy research.

I have got a better understanding of the issues mentioned due to the diversity of approaches regarding not only the theoretical and methodological areas, but the different experiences of people coming from a diversity of countries, with different political, social and economic environments.

Russia builds an innovative economy and practical experience of other developing countries was useful.

By increasing knowledge about other countries.

Learned from others work and exchange ideas with global colleague.

I have got better understanding about learning in innovation policy.

Especially to see research and policy issues from other countries (institutes) and cases from developing countries.

My area of research is actually mergers and acquisitions and its impacts. The innovation issue is coming in the impact side. So, it helped me to understand more about the innovation side.

By getting to know active research interests and what is happening in other geographies at a global scale provides a very good and broad understanding on research and policy issues in the developing world and global.

Engaged in several fruitful discussions on sectoral innovation system changes in developing countries.

Particularly the understanding that innovation is a multi-disciplinary field that requires very careful analysis in order to understand how it works in the contemporary world situation and also to develop policies with higher potential for increased effectiveness of innovation initiatives.

The diversity of cases has helped better understand the impacts of policies in different contexts. The variety of methodological approaches used by various researchers has also been useful.

Networking

As I am working on issues related with agrarian economy in the rural areas, conference helps me to sharpen my understanding about innovation systems. It gave me the idea that how it happens at grass root levels? And, what kind of challenges faced by the researchers across countries in the policy front?

Donor perspectives were useful.

Especially through various research presentations at the conference on national, sectoral and regional innovation systems.

Actually I learned more about researchers who have done innovation system research and evolutionary economics.

Based on feedback – new area of analysis such as value chain analysis was incorporated into my research work.

We can also apply in our own country and institution too.

It gives me a new perspective on how I can approach my research and relate them to the experience of other countries.

It is important to bring more evolutionary process and also from regional innovation.

My research focus on transition studies and through the conference I met people who wrote the concepts, so I got the opportunity to change the text (paper) into sound (meeting person), and even better, they can explain how their concept may fit with my work.

My work is specifically related to the difference between innovation policy and S&T policy. The innovation system approach is a very good "guide" for such discussion. The comments on my paper and some debate I have listened to have helped me think about these issues more clearly.

To know multiple points of view.

By attending various presentations, I came in touch with other researchers analyzing innovation from different angles, which helped me broaden my own view on the different aspects of innovation policy.

The multidisciplinary approach in the different plenary sessions helped broaden my understanding of research and policy issues relating to education.

I benefited from gaining knowledge on how to apply to concept of innovation in my field of study which is Heritage management and its other activities such as cultural tourism.

Attending to Globelics allowed me to interact with academics and colleagues from all over the word, from different academic approaches and from different development realities.

The conference participation and interaction with the wide variety of experts helped in formulating ideas and building connections with policy is a rare opportunity provided by the Globelics. The policy oriented work requires a some level of maturity and experience which is possible through interaction with the scholars working on the frontier areas of research and policy and one can find very easy access while attending Globelics.

It is important to know experiences from different countries.

I attended four Globelics conference as a PhD student. It has been a great and intensive education to me.

It is ensuring to exchange views with other colleagues through the Globelics network as this interdisciplinary area can be isolated in various different faculty silos.

By the comparison of the Mexico experience with the experiences of others countries and the dialog about these facts of the evolution and their policies.

One thing I remember from one presentation how innovation through technological change could be feasible solution for the less developed countries and for the poor people for better position.

Through presentations and paper presented. This has led to a new understanding to the issues within innovation systems.

The different presentations helped be widen my understanding of innovation and the mechanisms that can affect it.

Industrial cluster is kind of innovation systems and it need upgrade.

Identify new works by peers and new ideas for research.

Discussing with colleagues about the shortcoming of the IS approach and what we could do about.

The comparative studies of such systems in different countries proved to be of help.

Learning the experiences from other countries was useful for my conception of innovation systems.

Contributing to greater awareness on contrasting experiences.

The plenary sessions have been extremely important for improving my understanding about policy issues related to innovation. Also the deep reading of the paper I was committed to discuss made me face for instance, specific and interesting African policies related to the innovation systems, that I did not know before.

Case studies were presented from a wide array of country contexts, which provided good learning.

I was able to interact with researchers that approach innovation systems with different methodologies and with different scopes.

After attending some interesting sessions, I better understand the triple-helix in other developing countries, like in India, Mexico and South Africa. I also very appreciated the speeches given by keynot speakers. Par example, I learned the clear differences between classical economics, neoclassical economics and evolutionary economic theory and innovation from Professor Richard Nelson.

Innovation is the bedrock of development and not until a radical innovation occurs the greater development can happen but little improvement and value addition can transform an economy. Again, evolutionary economist (Nelson) argues that development is not a question of resource endowment but knowledge and intellectual capital issue.

Suggestions are made to include now some aspects such social capital ethnic networks, the adaptation of policies to the specificities of each country, etc. Those aspects must allow to a better understanding of the rationale behind some observed behavior.

Relevant topics and research area and methodologies.

To better understand the concepts of innovation systems and how to apply it to my research.

By listening to presentations of experts.

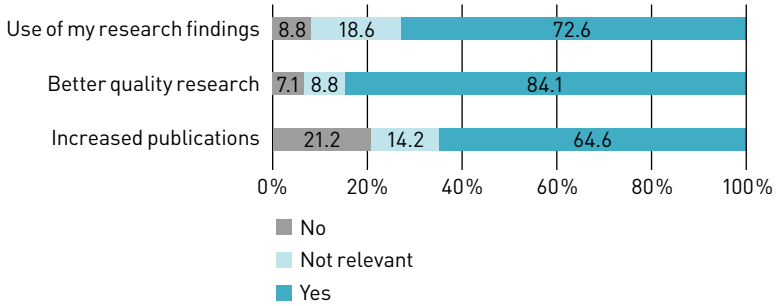
Sharing ideas.

Information from very different cases of studies helped me to broad my mind about global issues.

To understand innovation system is more than innovation. It could encompass a much wider and larger social and economic world, than the technology

Q19: Improved your research output, resulting in:

	No		Not relevant		Yes		Answered questions
	#	%	#	%	#	%	
Increased publications	24	21.2	16	14.2	73	64.6	103
Better quality research	8	7.1	10	8.8	95	84.1	103
Use of my research findings	10	8.8	21	18.6	82	72.6	103



Explain:

I got feedback on my paper from the discussant.

Better way of paper conceptualization.

Publications have increased in the international journals. Exposure has helped to push the ideas that I cherish with regard to latecomer development in these journals. I know a bit better about how to communicate those ideas to the community.

Suggestions on probable journals for publishing our work inputs from researchers already working in this field getting lines for further research work in the field, addressing knowledge gaps.

With the constructive feedback from Globelics participation, I went back to restructure/review my paper. This aided its acceptance and publication.

I am currently working on linkages of innovation of Africa agriculture.

I got feedback and comment from discussant and other participants in my presentation to improve the paper which is submitted to journal.

A jointly authored paper, presented in Globelics Dakar, are now under review for publication in the journal Innovation and Development, with researchers from Circle LUND met at the conference in Mexico. One always learns new things, and gets new inspiration for research. My problem is getting time to follow up on these ideas, in my current work context.

Though innovation has been a major subject area of research in CDS (Where I work) with my involvement in Globelics more students are working on innovation system perspective. Also every year at least two of our students from CDS participate Globelics conference and at least one scholar participate the PhD academy.

I have published papers first presented at the conferences. I have been engaged in collaborative research networks with colleagues that originated in a Globelics conference and that has been sus-

tained by regularly meeting at the annual Globelics to share progress and work on research.

Comments from the discussants and participants helped improve the paper.

I have been able to produce more number of writings as people get interested after the presentations, which also motivates me to respond to the knowledge pool experts.

Attending those conferences provided me access to knowledge which help me to improve the theoretical framework for my research on innovation and great opportunities to share research findings for comments from colleagues.

Getting in contact with researcher working in similar areas of interest.

We have organized some comparative research within researchers of the community, so we have interacted and learned from each other.

My research is improved by listening, sharing ideas with other scholars.

I re-worked my paper and submitted it to an international journal which published the paper.

My interaction was limited to attendance of one conference. Have worked on other things in recent period. But I shall be taking up issues relating to technological change in future and the proceedings of different conferences (not just the one I attended) would be useful to me.

Feedback is always important and useful to improve quality of the work.

My papers have featured in the Globelics proceedings and considered for special journal issue.

The feedback obtained at Globelics has allowed me to increase publications at national level. The next step for me is to increase publications at international level. Of course we got valuable ideas to improve our work and to find better ways of doing research.

In 2009 I protected doctoral dissertation, drawing on the researches, including in area of innovations.

Increase publication of research output in the internet.

Now I am national expert in innovation policy in government and worked for United Nations Economic Commission for Europe.

Regarding my presentation, the comments were not new to me. Myself noted those as limitations imposed by data.

The feedback from the discussants and the session audience was useful for further improvements of the paper for publication.

I.e., the conference offers a chance to test working papers in front of peers & a chance to meet editors of relevant journals.

I realized my work could even add up to two papers.

I have been able to improve my paper after the conference and through this will work towards publishing it.

Publications in international journals are still in the "pipe-line". I cannot judge myself if my research has improved. Further, it would be difficult to establish a direct causal link between conference participation (only two times) and higher quality research. It is beyond doubt, however, that discussions with colleagues – both during the sessions and informally – have been useful. I don't understand the third category "Use of my research findings" in the context of "improved research output".

These are longer term impacts, yet to be realized.

Feedback helped to refine my research.

Was trying to use the sectoral innovation systems in the traditional knowledge sector. The main work of attempting to relate the innovation systems with the value chain approaches.

Few policy-makers were interested in my results.

Improving the research quality results in better or quality research outcomes, in turn show in better research papers not in quantity but in quality (by more citations).

I am basically a researcher concentrating on the aspects relating to manufacturing productivity. Few papers were presented in this area and there was hardly any discussion on these papers.

More and more research can be conducted after getting more exposure with the interaction of almost more than 200 people of 50 or more countries.

My research findings can be useful for the researchers who want to excel their research in the field of economics.

It introduced me to new ways of presenting research findings and it gave me a more global outlook on how innovation is being practiced in different countries.

I definitely got new ideas from the conference, but since I still have to test whether those ideas may work, so there are no new unplanned publications.

I am now writing a paper which is a "natural" development of the one I wrote for Globelics Conference in which I include some

suggestions and results form a more mature way of thinking the issues I try to raise.

Too early to assess impact on publications.

The peer review /mentoring approach used has helped me to get constructive feedback from reviewers and this has helped to strengthen my research capacity and understanding of my field as useful information to enrich the study were provided.

A better conceptual approach which has benefits the quality and quantity of my publications. Have already published 2 papers after the conference.

The feedbacks, the new ideas and the possibility of presenting my work offered me new opportunities to publish.

Some of my studies have been included in the syllabus of the Universities.

New data and theoretical insights.

The network opened spaces for joint project with researchers in different countries.

I published three papers thanks to the GLOBELICS network during my PhD study. I don't fully understand what do you mean by "use of my research findings"?

I have my Globelics conference paper selected to be published in the book on innovation of developing countries. I also was able to get better exposure to the right community while I was doing PhD. This helped me greatly when I was getting a job.

The updating of my research with the issues discussed in the Globelics Conference does possible new publications and the critiques received during the meetings of the GC have improved the objects and methods of own research.

I got so many good comments now I am incorporating in my thesis.

Incorporating innovation as a segment and variable within my research.

Dick Nelson in particular has helped shape my thinking a lot. He is also very generous in giving constructive comments. I also found Bengt Ake exceptionally great as a leader of the outfit supporting sincere scholars irrespective of color, gender and creed. I will now try to work a lot with him if he is willing to share with me the time Dick has afforded so far.

I got more understanding on industrial cluster!

I was any way publishing. I do not think the conference has given me more publications.

The feedback during the conference usually helps to improve the quality of papers and then submit them to journals. Some journals have contacted me to publish the papers I have presented at Globelics.

Well, the discussion of the papers and some specific topics always result in better result, in this case was really useful to finished a paper for publication and to improve my PhD thesis.

I am yet to incorporate and build on some of the feedback I have received from 8th Globelics, 2010.

In fact, after the conference, my paper was selected to be published in the Journal of Structural Change. The process is still going on.

Discussion of research outputs at Globelics provides helpful feedback prior to publication.

The comments I received from the chair, the discussant and the peers helped me to improve the version of the paper I presented in the conference. They also gave me a broader vision about the related literature. Furthermore I am glad to have the opportunity to publish my paper in the Journal of Institutions and Economies.

As the conference was only very recent, these are not relevant. However, my participation as chair of a session and paper presenter were very valuable – I learnt a lot from the feedback and from chairing a session on a closely related theme.

I met my research collaborators in the Globelics. We have submitted or plan to submit our papers which were presented in the Globelics to good journals.

Publication is one of the criteria for promotion and to actually create a niche for oneself, attending and presenting research results refines ones thought and better output.

I have received some feedback how I can develop my research further.

I have received lot of new ideas from other scholars and now I am keenly considering the lesson learnt in the conference.

I had some ideas from papers presented in the conference to improve my data analysis methodology.

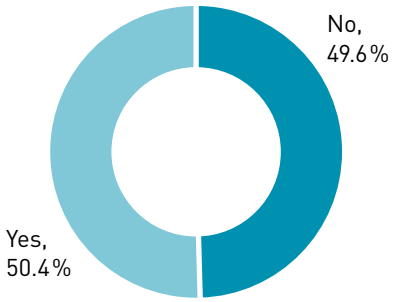
Getting to know new researchers has opened new possibilities for collaboration.

Has been able to work in projects related to GLOBELICS groups, which culminated in better quality and increased number of publications.

POLICY IMPACT

Q20: Advice governments and other users on improving innovation system issues/policies

	#	%
No	56	49.6
Yes	57	50.4
Answered quest.	113	100
Sample: 121		



If Yes, please explain:

As it is an emerging area, this will help for better policy making.

Through National Innovation System Concept.

Other countries experience can be benchmarked better. I can speak of them in a more knowledgably way.

Through publications, presentations in other forums.

By considering the result of research and its implication in area of innovation.

I am in a policy advisory role in El Salvador and can use the ideas from Globelics in this way. This potential has yet to materialize in concrete efforts in this area.

I am the ministry of commerce Chair in my institute. My recent report on structural infirmities in planation sector approached the problem from innovation system perspective and it was much appreciated by the ministry.

I have used the innovation system lens in my work with national and regional (SADC) higher education organizations.

The Globelics and other sub-network like Asialics where I actively participated as one of the founders of the network should find the way to reach policy makers in each country, thereby introducing new concept such as national system of innovation to be applied in the country.

As I have interactions with policy makers in Mexico, I use the knowledge I have acquired to improve my recommendations.

It is very important to all countries.

I am a member of Consultative council at the Ministry of taxes.

Innovation is for development.

Many of the papers presented will help various government to formulate innovative policies for their development.

Globelics has made my work more accessible to policy makers.

Learning from the experiences of other countries to improve innovation system and policies.

I have taken participation in 5 session Committee on Economic Cooperation and Integration (Geneva Dec. 2010) as national expert during discussion about Innovation development in Belarus.

Not now. I have to learn more. Innovation system was not my focus area. However the conference helped me to understand it.

Sharing knowledge with firm level managers on research outcomes and others in ministerial institutions through informal connections allow expansion of their knowledge as well as consideration for possible implementation for development.

Provide innovation support that has higher potential of increasing financial performance and sustainability of the private sector organizations.

I have been "country correspondent" for two major EU networks for years: ERAWATCH and INNO-Policy Trend Chart. Besides, I have been involved in EU FP7 projects, as well as an EU "High-level Expert Group" dealing with policy issues, and also edited (and contributed to) a comprehensive background report on the Hungarian NIS for the OECD review on the Hungarian NIS. My participation at GLOBELICS conferences has certainly contributed to these projects in an indirect way.

This creates better results specific to make living of unreached communities' life better.

In order to follow the model of developed countries where it would be successful.

Pakistan is full of natural resources but main problem is that there is no innovative mechanism for the exploring the potentials. There is a lot of room for its improvement.

I am the team leader for the Philippine research team on city innovation systems. This research aims to help government and policy makers on improving the conditions of the mega cities in Southeast Asia.

For developing countries, the emphasis should be given to indigenous technology and bring new technology which can improve the efficiency of old technology.

The subject that I focused on is still new in my country. I already wrote one paper about it, but that was just a very small step from changing the whole paradigm.

The main object of my PhD thesis is to critically analyze innovation policy for nanotechnology in Brazil. Therefore, after this

conference I did many reading based on the comments I received and it has helped me out on thinking effective proposals for innovation policy research.

Some papers were more policy oriented.

I have made proposal to government to review my organization approach to capacity building. My studies have been used to guide government through provision of evidenced based information to formulate policy.

Have not had an opportunity to engage with the government yet but this will definitely be of great importance.

By knowing other experiences, especially those from developing countries.

I have used some ideas and information obtained from conference presentations to back up analytical texts for the Ministry of Economy evaluating their programs (Concept 2020, Budget 2011–2013 etc.).

I taught in my MBA classes in China. Some students are from government.

This is in process. The conference paper presented in Malaysia is ongoing policy suggestions for Natural resource based industry in Chile. Though it is very difficult to say whether there has been an improvement.

I am advising about the institutional mechanisms that uses the Consultative Forum Scientific and Technological, an state network that it is the principal space of the governance in the Mexican system of innovation.

I have done this in over 30 countries since 1996.

Our local governments should do more to upgrade industrial cluster.

I work in several -formal or not- space for discuss public policies, the learning process of discussion clearly help for this work, but of course not in linear sense.

Government officials pay attention to Globelics' Agenda.

A better understanding of the innovation system means more accurate outputs of my research. Consequently it expects to eventually produce useful advice for research users on improving innovations system issues or policies.

By designing a robust STI policy to drive the economy.

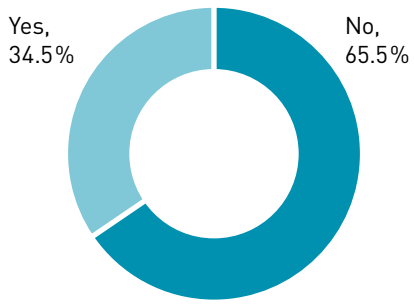
My colleagues (others).

I have recommended some 8th Globelics Conference's papers to my peers (PhD Students) because of finding new and interesting approaches in these presentations.

RESEARCH AND UNIVERSITY IMPACT

Q21: Changes in research orientation

	#	%
No	74	65.5
Yes	39	34.5
Answered quest.	113	100
Sample: 121		



If Yes, please explain:

A new way of looking at my own field.

After discussing with Baskaran and Ricardo, we find both are interested in cross-nation studies of technology business incubators in China, India and Mexico.

Better interaction.

How to manage time.

I am in the same broad topics, however I have explores some new issues for me.

I am increasingly applying evolutionary and institutional analysis of economic issues, not necessarily on systems of innovation, even in other areas of study.

I changed my research orientation from industrial engineering to innovation research after my first Globelics conference in India.

I have changed my research topic and involved innovation mechanism in some in Pakistan.

I now have a broader view of development issues.

I shifted my work on higher education from an internal, organizational approach to a systemic, developmental approach.

It is always good to exchange the environment and get back to some interesting ideas.

It is leading me to innovation in agriculture as against only risk in agriculture and management that i have focus before.

It is interesting to me.

Learned about the concept of Distributed Innovation Systems from one of my reviewers, which gives a new orientation to my work on Distributed Generation of Electricity.

Many gray areas were identified during the presentation which will dramatically help me improved my research capacity.

More focusing on innovative aspects of research.

My research orientation was already very much in line with the themes at the conference, but new themes arrived to be explored with new partners.

My research focus has remained unchanged.

My research interest is being influenced towards innovation systems.

My students doing doctoral thesis benefited from my studies and experience gained in the frontier areas of research.

New perspective were received from the reviewers and other scholars.

Not much, but a part of new analysis component was taken upon.

Participated in the innovation study network has help me to have better orientation towards learning more the role of NSI as new approach to pursuit sustainable development.

Refined methodology and data analysis.

Some of the presentations like Prof. Nelson were a treasure of knowledge.

The knowledge on the active research interests led to possible extensions of my current research.

The possibility of interacting with peers and to be in contact of different ways of doing research always impacted on my research orientation. That fact that Globelics join researcher from different countries and different disciplines is indeed a great source of increasing creativity for present and future research.

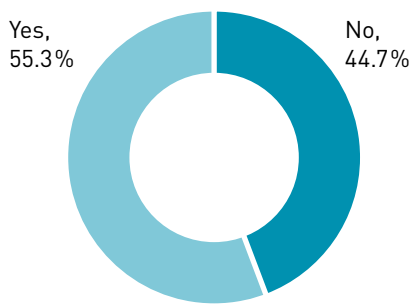
The systems of innovation framework within the evolutionary school of thinking changed my thinking enormously.

Yes, have incorporated innovation as another key variable in my research.

Yes, i some sense, I started to be interested in new topics, in particular linkages academic-industry.

Q22: Helped by learning how to adapt and use innovation ideas in your own work

	#	%
No	50	44.7
Yes	63	55.3
Answered quest.	113	100
Sample: 121		



If Yes, please explain:

Again, new ideas emerged to be integrated into my work, for example on the roles of multinationals, but especially their impacts in the country, including innovation impacts.

Because it provided new insights into what I used to know.

By capacity building and sharing of new ideas.

By sharing the ideas of different researchers, I have also learnt that how to mold the research topic towards innovation.

Creating new area of research.

From other papers presented.

Globelics is very important to get new ideas for research; interaction with people is a very good source for seeing new ways for approaching the same problems.

I could relate some of the feedback I obtained from the conference with what I have proposed to do in my research.

I had this idea from Bengt Ake, Dick and others works earlier but the conferences have expanded my understanding the depth of these things.

I have been able to adapt my research in a way that allows me to communicate better with the innovation policy community.

I have got better understanding modern innovation policy and can to improve my research.

I have learnt to improve my research through experiences shared at Globelics conferences.

I have modified the extension and the relationships that comprise my study objects and I have completed the type of procedures introduced in my methodological approach.

I learned how the spillover effect of contract farming on farmers' efficiency.

I pay more attention to interact with different people since I started my research on innovation.

I will do the research related innovation system because I found it is interesting!

In this innovative techniques and ideas would be more practical.

It is evident in my research on India's plantation sector.

It is not easy to use an innovation systems approach in relation to a country like South Africa or to higher education issues and I have drawn extensively on research papers from the Globelics conferences as I grapple with concepts, ideas and research approaches.

Learning to use innovation system and approach from economic perspective.

New ideas from colleagues in the network.

New studies conducted in collaboration with other scholars certainly improved my understanding and quality of research work and output.

Non identical configurations of National Innovation Systems presented at the Conference were really helpful to my current work.

Receiving feedback about my work helped me to improve it by using other literature innovation strands in my work.

Specially it helped to understand the necessity of a critical revision of some specific approach.

The discussion on issues did tell me that similar things are happening elsewhere in the World. This made me search and research on them. For instance my research involved looking at technological innovations and spin-offs from academic institutions, so I was glued to different universities technology transfer offices, experts there and looking for their views.

The knowledge, idea and approaches obtained from participating in the innovation study network help me to lead my Department of S&T Human Resource Policy and Organization much better academically.

The sessions that I attended helped me realized how I can adapt the concept of social innovation in our research.

Through interaction with several people I learn how to adopt their concepts into my own research.

Using new research results in NIS concept in my university teaching courses.

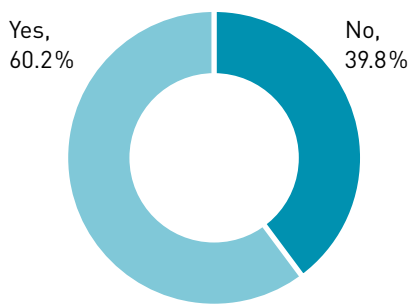
Yes, I am use the conference knowledge gain in my current postdoctoral research on agriculture and innovation.

Yes, I want to apply it in merger cases.

Yes, It made me to learn to adopt new value chain analysis part into the research work.

Q23: Increased your involvement in team and interdisciplinary work

	#	%
No	45	39.8
Yes	68	60.2
Answered quest.	113	100
Sample: 121		



If Yes, please explain:

After that Conference a group of researchers doing research on similar topics decided to apply for a special issue on the topic in a Journal.

Although very related to economic theories, Globelics is a place where different scientists converge and because of that, new approaches could be learned.

Because I understand benefits of innovation, I want to promote innovation to people.

Because my research is interdisciplinary work.

But still looking towards collaborative works.

By working on two projects involved with Globelics groups-Industry Academia interaction, Innovation and Inequality, and now the ingineus project.

Creation of new links with international and Russian scholars participating in conferences.

Chairing sessions involves collaboration with various persons and brings one in touch with various disciplines sometimes different from one's own.

Fellow researchers and professors help in proving or disproving the hypothesis in your own mind. So interaction with them also expands our thinking horizon.

For the participation in research teams.

Globelics allows interaction and interchange of ideas; and opens the opportunity for collaboration.

Globelics participants vary a lot. People like Bengt Ake are really helpful but there are also the selfish there. I take Bengt Ake's leadership here on interdisciplinary research and Dick's constant prodding on inductive research as important in driving my own research objectives.

Had worked out projects involving team work and people from different disciplinary backgrounds.

However, in future I shall try and take up some team work.

I am becoming more active in the network and will take a lead in hosting the next Asialics Conference to be help in Hanoi during 7–9 July 2011 in Hanoi.

I am involved in an on-going EU FP7 project with colleagues, who regularly attend GLOBELICS conferences, but we have known each other through other projects/ meetings, too, i.e. a direct link between my participation at GLOBELICS conferences and involvement in this particular project cannot be established.

I got new network and we are planning to have a further meeting to discuss my research.

I have been involved in an international collaborative project on university-industry interaction that had its roots in Globelics and has been sustained by regular meetings attached to the conference meetings. As a sociologist, it has been a challenge to work with economists and has stretched my capacity and added new dimensions to my work – not always easy or successfully!

I have been involved in number of projects jointly with the Globelics scholars.

I have collaborated with the researchers of BRICS and published jointly with them. I am in touch with many more European, Asian, Latin American and African researchers. My collaborations are growing in number day by day.

I have made wide and quite interesting research link with many scholars of the world.

I hope to be able to follow up on contacts made at the conference in this sense. My work at FUNDE is already quite interdisciplinary, with applied research being combined with policy advocacy and advisory and technical assistance and training to local development actors.

I now collaborate with other scholars to conduct study from a multidisciplinary perspectives.

I still contact some researchers working on topic related to mine.

Improved ability to work with people from different disciplines.

In the class of researchers in my department, I am now in a position to tell them about the new techniques of research.

Increase involvement in network.

Increase networks with the research and academic community to think about new research and future projects.

It assisted in contributing to the group research work in my organization and how to design research report.

It consolidated intra-network cooperation, opening new avenues of collaboration with a view to foster research activities and publications.

Joined a research team related to my paper topic.

Linked with peers.

My background is engineering, so the ideas from evolutionary economics help me to better understand innovation processes.

Network created in the conference help to do the collaborative work. It has also become a meeting place for this network of

researchers to plan and discuss future works. For instance, as many researchers gather together at Globelics meeting, it has become more than just a conference (to enhance and deepen the understanding etc) but rather a trade fair of research on this subject.

Networking can lead to future collaborations.

Networking opportunties were increased.

Networking with other researchers.

Not now. It is a long run issue. May be in future it may.

Not yet but may be it will.

Our book about the Mexican system of innovation it is a good example (see Dutrenit et al., 2010).

Our tutor also got new ideas from the conference; we will do the further research!

Regarding the area I am working on, need to have a fresh interdisciplinary attempt of economics, sociology and anthropology. The tools, which the GLOBELICS deals with are well fit to this frame.

Research projects: university-industry linkages funded by IDRC (12 countries).

Thanks to the Globelics network I started to work in a team that solved my problems regarding the accessibility to data for my research.

That is leading to get involved in other field like trade and investment, china market and so on.

The benefits of friendships from the network have helped me in the quality of my work through exchange with other professionals from around the world.

The more knowledge received the more desire to integrate with other disciplines. The integration with scholars from other disciplines have been very useful to understand how I can contribute with my knowledge and background.

The research collaboration with scholars working in other than my own institution have been possible and remained quite fruitful in terms of outcome also.

Their by making me to have fully involvement in research orientation.

There are new ideas that I can bring to our research which comprised of 6 countries in South East Asia.

We are now organizing interdisciplinary seminar among the Chinese faculties with diverse background in Lund University.

We can do research using information and data of more than one country.

Q24: My participation and increased capacity could have been more effective if:

General

I have no specific suggestions in this regard. (16)

Everything is ok.

I think I have benefited much.

Time/Structure

The period of the conference was extended.

The time schedule of Globelics conference is not too tight, so we have more time to think and absorb new knowledge that we obtain from the conference.

Fewer number of parallel sessions so that there would be greater participation in each session.

We could have more time to discuss after the presentations.

Les débats sur les présentations étaient plus longs. Ils m'ont paru trop limités en temps.

Focus

There existed a better network at home in India. Thanks to the participation in four of the Globelics Indalics is now coming into existence. For long I have been interested to give a shape to Indalics and it is now happening. In fact I have 50 % of the responsibility to organize it in India.

The conference had more papers on my area of interest.

I think it could have been more effective if there was stronger inter-disciplinary participation. Mexico had a wider participation and I found it the most enriching conference.

If discussion of scientific problems was discussed directly during carrying out of scientific researches.

Quality

There was better evaluation of the paper that I had presented.

I have received more feedback on my own documents that were discussed in the Conferences.

Dissemination

It has led to direct publication of research paper work through further improvement

Participation

I attend this conference as a yearly exercise; whether presenting paper or not -so I could keep trend with developments in the field of innovation.

My institution (a small centre for development research and advocacy – i.e. think tank, could strengthen its overall research capacity.

I were able to attend as many sessions possible in the two conferences I attended.

I could have participated more regularly in those conferences.

I attended the last conference in Malaysia.

External factors

I arrived on time at the beginning of the conference. I faced flight delay for 1 day.

I will be a government employee.

I involve in a project which has available financial budget and clear research purpose.

RESEARCH CHALLENGES

Q25: The greatest difficulty you face in undertaking research on innovation systems are due to:

	Low		High		Significant		N/A		Answered questions
	#	%	#	%	#	%	#	%	
Lack of financial resources	10	9.2	52	47.7	39	35.8	8	7.3	109
Lack of time	46	42.6	11	10.2	36	33.3	15	13.9	108
Administrative demands	38	34.9	14	12.8	35	32.1	22	20.2	109
Lack of demand for such research	59	54.1	6	5.5	24	22	20	18.3	109
Not as relevant for my country	58	54.2	4	3.7	15	14	30	28	107

Explain:

Ground level experiences require field experience, for which we need to go to firms. Most of the times entering a firm is constraint due to lack of contact with the industry.

I am an early career researcher (just after finishing PhD) who is about to start experiencing the funding system. Therefore, my above responses on external factors are only estimates.

In my origin country the term innovation system is a magic term in the sense that everyone want to understand it better. However, the concept itself just rose recently, so many people like to act based on their own perception and coordination become one of the main issue.

Lack of interest/awareness among stakeholders such as business firms and users is a major hurdle in data and information gathering.

More team work; data bases are weak; statistical information and relevant indicators are missing; much more action research is necessary. Then only we would be able to give a solid foundation to the ongoing work on innovation systems.

Most of my work is financed by EU funds (research or consultancy-type projects). Innovation is not a major issue for high-level Hungarian policy-makers in general. Middle-level government officials dealing with STI policy issues only have inadequate funds to commission scientific analyses, and usually do not have time to "digest" research results, and engage in a dialogue with researchers.

Not clear research methodology knowledge.

Not working in the area of Innovation systems.

Often I have to concentrate more on my teaching. Also focus of my research is not just on innovation systems but development economics in general.

Strong institutional support.

There is still a lack of understanding of it outside the academia.

Time spent on local development projects, not related to innovation.

Q26: Based on your own increased capacity, do you think, you were able to contribute:

	Not noticeable		Somewhat		Modest		Good		Excellent		I don't know		Answered questions
	#	%	#	%	#	%	#	%	#	%	#	%	
Increase knowledge inputs to society, production and firms	7	6.4	19	17.4	21	19.3	44	40.4	14	12.8	4	3.7	109
Improved capacity of universities to collaborate/ initiate problem solving/R&D projects	11	10.1	13	11.9	19	17.4	37	33.9	15	13.8	14	12.8	109

	Not noticeable		Somewhat		Modest		Good		Excellent		I don't know		Answered questions
	#	%	#	%	#	%	#	%	#	%	#	%	
Increased cooperation within University	13	11.9	12	11.0	20	18.3	37	33.9	15	13.8	12	11.0	109
Increased cooperation within departments	13	11.9	11	10.1	23	21.1	36	33.0	12	11.0	14	12.8	109
Changed/influenced direction of research	12	11.0	13	11.9	29	26.6	31	28.4	16	14.7	8	7.3	109
Changed/influenced direction of teaching?	19	17.4	8	7.3	19	17.4	32	29.4	18	16.5	13	11.9	109
Increased dissemination of results to policy makers	9	8.3	8	8.3	31	28.4	35	32.1	17	15.6	8	7.3	109
Influenced student training and perspective	11	10.1	9	8.3	13	11.9	41	37.6	23	21.1	12	11.0	109

Q27: In what ways the organization of GLOBELICS could be improved to increase the benefits from interactions, the "use of knowledge about innovations" in your country and in the economy?

Main Ideas:

More country and regional oriented conferences.

Open calls for new thematic research.

On thematic and regional approach

It should invite more researchers from India.

To organize special parallel sessions or round table about Russian NIS and innovation policy.

By hosting it in Nigeria.

I believe when policy makers e.g those in the legislative and judiciary are made to participate, or the result and implications of globelics disseminated to them, then countries will better benefit. This would be better possible through regional Globelics like Asialics, Briclics etc. Unfortunately, we are yet to have africalics!

I think Africa should be more focused.

More scholarship for African to cover their travel expenses.

Organization of a LatinLics, a work that is pending for 2011 and Buenos Aires conference.

Formation of India chapter is the first step.

Further expand its activities in my country and follow up with a limited research topics on innovation.

Next year will be very important for us because Globelics will take place in Argentina. For our country it would be very interesting to have some important books in Spanish.

Je crois que le fait d'organiser la Conférence à chaque fois dans un nouveau continent et en impliquant les pouvoirs publics est en soi une bonne méthode.

Hold in our country.

Provide more opportunities for African scholars to participate.

This provides a good opportunity to present what is happening in less developed world and furthering opportunities for researchers from these countries to present their findings, otherwise hidden could benefit the country by revealing what is happening and what could be done for development.

Let's be more empirical! Academic institution based teams to study about the regional experience to understand how innovation systems works at decentralized levels and prioritizing the questions need to be addressed at the institutional level.

Well, maybe the conference could be organized in Finland.

Local chapters are to be made functional with the aims of Globelics.

There should be more sessions that are country or geographic area specific.

If GLOBELICS arrange more conference in my country. Also if they provide fund to do research in this area.

Globelics should identify a set of clear cut themes; solicit fewer papers of a better quality and more time to discuss the papers. This would certainly, in my view, improve interactions among various scholars.

There could be an effort to rope in more institutions and firms operation in the R & D of sustainable technologies, especially in developing countries in Africa and the rest of the world.

Emphasis on local Globelics chapters might be useful.

By giving more emphasis to policy issues and by keeping it open to new participants from around the world with good research ideas and interesting contributions on the relevant topics.

Organize research teams and apply for government or industry funding.

The conference should improve developing.

Policy suggestions. It would be useful to include presenters from Russia into panel sessions.

It must be more involved in my country Pakistan. Although Pakistan's contribution is very less, so Globelics can take it opportunity and initiate in Pakistan and play a role model in sti.

I would say tie up the knowledge of innovation with the disciplines of future studies and Climate Change.

Since I am Venezuelan, I think that creating a Latin American Cluster (very similar to Asialics) could be a good idea. I went to Globelics' website but could not find anything similar for LA (I know there is a brics project, but it includes only Brazil and latest info is dated 2008).

Networking

Interactions would be improved if more of collaboration between researchers gets engineered. Globelics is day by day improving in this respect. The journal entitled Innovation and development is in the process of being launched.

Building up a network projects across the countries/regions and sharing the results in every Globelics.

Expansion of scientific contacts and exchange by opinions.

By setting a space where policy makers and scholars can interact.

Promoting research networks with specific research projects.

The Globelics committee should promote elements of cooperation and social relationships to build links.

My country will be the next Globelics host, then I think this will be an excellent occasion for benefiting from interaction.

I think the forum provided an effective platform for scholars to connect with one another and keep in touch after the conference.

Globelics and the systems idea is still largely restricted in their appeal to a large part of the academic world and policy makers, especially in developing economies. Globelics could make efforts in this direction to reach out to policy makers, think tanks, academics and other opinion builders in society to influence the way growth and technological change in perceived and pursued in these countries.

To involve new (or more) actors

By inviting Government officials.

The Globelics is able to gather scholars from different part of world to discuss about experiences of particular countries in learning process and innovation.

I suppose one way would be to hold public side events that are open to and aimed specifically at stimulating debate with policy makers in the host country.

People need to be more aware of GLOBELICS. More number of institutes need to know about it. There are over 500 universities in the country, a little over one million engineers graduate every year and the numbers of PhDs are increasing in India, thus we need to tap the scholars to present papers, of course after scrutinizing the good research papers.

Invite government officers to participate the conference.

Elaboration of special materials oriented to policy-makers.

Greater interactions of researchers with government and corporate.

It seems to me that Globlelics is doing well its job regarding interaction between researchers and academics, but in order to have some impact on the economy and innovation systems of the countries it is important to improve interaction with government officials and entrepreneurs.

Increase financial support to increase participation of more participants.

Initiate some research project and include policy maker into the activities.

Unfortunately it is yet received or understood a priority by the public sector and the economy in my country

More interaction with the policy makers. Disseminate the research output to them. Media can be used more effectively. And at the grass route level, we need to have a close contact with those who are practicing/implementing innovation.

Participation of CGIAR centers was distinctly absent. Don't know the reason. Probably, participation from them would enrich the discussions.

They provide the model to our country, and encourage more and more researchers from developing countries

By developing more practical network after the conference is over. Probably by making more homogeneous group, whether it determined by research interest or organization role (policy advocacy etc.)

By involving a stronger participation of non academics in the conference. Local entrepreneurs in developing countries could strongly benefit from Globelics ideas if their participation was facilitated.

Nice interactions.

By inviting scholars who approach innovation questions from different perspectives (e.g., neoclassical economists) to the conference.

In my country Globelics involves mainly economists. It would be good to have more engineers participating.

Introduce more practitioners to Globelics. They can be keynote speaker or even committee member.

Participation of private sector – as panelist?

Cooperate more with our universities and local governments!

Inviting more policy makers to discuss and mingle during the sessions. Mixing academics and policymakers.

Perhaps by making an effort to involve more people from the Governement.

Inviting people from firms and government.

I find it very positive that each year Globelics is carried by very different countries in different continent. However, it seems to me that the conference should be taken inside the university in order to try and bring young people may have an unique opportunity to know what the issues related to system of innovation are about.

Time

Obtaining new ideas would have been the way but the very tight schedule doesn't allow you to understand most of the papers quite well and to participate in the discussion.

More feedback/discussion on the papers that are presented.

More time to be provided for the parallel sessions.

More time for conference participants to interact even after the conference.

Extend the "mandate" of Globelics to former centrally planned economies in a comparative approach.

More participation in parallel sessions.

Giving more time to the discussion of papers and the interpersonal relationships.

Communications

Facilitating access or dissemination of information about existing funding opportunities for related research areas – particularly useful for young researchers with little experience in rising research funding.

The organization could inform scientific community on the activity more widely.

Regular communication of conference proceedings with presenters and policy bodies.

Increase publication of research output.

Globelics more diffuse in the African continent.

I think if Globelics share their conference proceeding with each and every country. By this way may it would benefit the country by diffusion of research if possible.

To create more awareness about new innovation systems among the researchers and their dissemination among the population in the country.

If there was a way of arranging dissemination methods such as workshops or seminars with institutions in countries on the importance of innovation.

Globelics annual conference should include specialized country policy papers on innovations and policy outcomes must be sent to the Ministry of Science and technology.

Increase the diffusion of ongoing projects and the results from projects that have been possible thanks to the Globelics network.

Set up a website to make participants freely exchange their mind and show their research work.

Doing more sensitization. Many people political makes don't know GLOBELICS. Write to the Government. In Cameroon, contact the Ministry of Economy and Planning.

I think Globelics could invest more in spreading knowledge about its own work. Even though is a relatively new organization, it is still too little known in several countries, being concentrated within the departments to which participants belong to.

Focusing on the paper with policy implications. Increase the method of dissemination of the results through some publication supports. It is true there is some Journals exist at each Globelics for published the best papers, but it is not sufficient because it remains very selective, only for the scientific world.

Contributing to make translations of the most important works presented at the conference.

If Globelics could have a journal to spread more its ideas.

Other activities

Teaching and training.

Besides organizing conference, Globelics whether can finance some projects to bring academic results into application.

By providing training, funding, workshops and seminars.

Funding of participative research projects involving academics, industry-based researchers and government officials.

Support the researchers.

Giving more funds to young researchers and ensuring participation of larger pool of veteran researchers.

Bring better understanding of knowledge and innovation system.

By organizing trainings/workshops for your researchers who are new into the research area to train them and develop their skills.

Travel support ex ante.

Doing summer schools, workshops, and so on, in developing countries.

Through the organization of DEIP workshop and having a policy dialogue on innovation maybe with more activities like the Globelics academy, and with financial support for collaborative research project.

Better quality submissions.

International research projects.

Perhaps have more breakout sessions discussing on individual countries as case studies and breaking that down further into sectors and the types of innovations. Would be good to discuss it on a country perspective, the policies and politics involved in making innovation work at all levels.

Q28: Please provide comments on any other benefits you received from your participation or improvements that could be possible:

I learned a lot on innovation and also increased the international networking.

Expansion of interrelations with international scholars.

Improved knowledge of National Innovation System operations.

Globelics should be doing something to help the developing and developed countries to come together for the development of relevant indicators and statistical information systems. Globelics can also do something about promoting joint programmes on the issue of how we can address collectively the global problems and challenges of hunger, disease, climate, energy, development of knowledge commons and so on.

Meet up/listen to with key people working in the field.

The two times I attended, I was assisted by Globelics, otherwise I may never have participated – I am grateful for this.

To learn and interact with other cultures.

I will be able to do better research if i finally get the resources.

Networking.

To meet other scholars from around the world that have similar interest to make a network for further research/study, gather new knowledge about recent issues in learning process and innovation.

Possible new job opportunities.

Friendship with a number of good people across the world.

Arrange the conference in a country side not in spacious hotels but in small conference sites where people can have close interactions and where they have sessions in the evening and where the discussions can have longer time. Let there be no time constraint put to paper presenters and let there by dissemination of knowledge through discussions and debates. Let the sessions be not too formal ones but having some casual settings.

The benefits of a community of scholars are not easy to measure.

I got lot of inputs for my PhD thesis. I also made many friends who keep writing to me.

Better access to latest research idea and approach.

Joint research with world renowned scholars.

To participate in Globelics was an excellent experience for me. I was able to have very good feedbacks of my presentation. It was extremely important to discuss the issues of research with experienced people because we could improve our work because of that.

Friendships.

Communications with foreign colleagues have considerably extended.

My strategic view about innovation development.

The flexibility in the program allowed me to attend various sections.

Good introduction to the breadth of research and to other scholars. Encouraging for someone starting on the research curve.

J'ai beaucoup appris des autres participants, notamment sur les réseaux de recherche en Afrique.

Know about what they focus on.

More funding should be made available to participate in the research and conference attendance.

No matter how critical the outcome of a research, without good and appropriate policy, it would be rendered void.

Listening to different leading researchers was very useful to me.

Globelics is based on interaction, and it is Ok. Maybe it is required to promote the participation of new colleagues from

countries that are not participating. As I said, interaction with governmental officials and entrepreneurs would allow us to learn different things from different perspectives.

Distribution of innovative culture.

Advanced learning on the system of innovation network.

Get to know some good friends and start up new collaborative research.

Research methodology.

I like being part of this network especially following up on new trends in this area but I started doing more practical work (than research) and I think there should be some way that I could join (not only by presenting on research findings).

Of course visiting a country will enable to understand many things about them, the differences and similarities etc, which I enjoyed a lot even if the time limit was there.

It spir up my research interests on innovation systems.

Networking, getting to know the leading scholars in the field and benefiting from their wisdom.

Afforded me opportunity to visit Malaysia.

Meeting new people and creating friendship.

Another important benefit has been gaining some impressions of different cultures while attending GLOBELICS conferences.

Interact with the top scholars in the field of evolutionary economics.

Useful interaction with the Globelics community.

I add weight to my bio-data of C V.

Contacts established with peers might be useful for my future research planning and implementation.

A better outreach for my work and the financial help from Globelics helped me to successfully finish my field work.

The most important thing is to get to know people and see what they think and do. I was especially interested the questions of China and India, and the interactions between those countries. I did not notice these issues beforehand but it occurred during the conference.

My participation definitely made my research outcome better by getting well deserved feedback at the time of presentation of my paper. But, if I got all the reviewers feedback might be made me better understand the principles of innovation and could be incorporated well into my research.

Firstly thankful to Globelics. It can be more benefitted if they continue to provide the travel grant, in this we would be able to get

more exposure and experience. Also we would be able to publish the presented papers in refereed journals and i do have publication in AJSTID.

The travel grants have been very useful. Possible research collaboration with other countries is one major benefit that I got from this conference.

New idea for my research.

What I love the most from the conference is hope. It always nice to meet a lot of people who have the same dream as me. In practical things this means network, informal discussion and friends.

I had the chance to get to know a part of Southeast Asia, and experience a great opportunity to see and live for a short time a very different and interesting culture.

Coming in contact with different local cultures is also a form of enrichment, beneficial for the innovation research.

It has been important to create social networks, may be to do research projects with other scholars.

Good community but needs higher standards in terms of scientific output.

Having a deeper understanding of innovation system and networking with other scholars all over the world.

The networking is fantastic.

I could understand other realities. No all developing countries are the same, and that is a very important matter when studding developing issues.

Increased self-confidence about taking a qualitative (case-study-based) approach to innovation-related research questions.

My attendance of Globelics has greatly benefited in developing collaboration with scholars other than my own institution.

I have met new people and received useful comments on my research.

Knowing people working in similar topics.

I see the world through the conference of GLOBELICS and learned how to communicate with people from different culture.

The professional relationships about others connected topics.

I found many good friends in my area of research.

I was very happy with the conference, being that it was my first. Positive feedback on my paper, which led to a lot of networking and potentially new ideas. Perhaps has also moved my research more in depth towards innovation, as per its main theme being in global value chain.

I enjoyed a flight subsidy from Sida in 2007.

Malaysia is beautiful, and I like it very much!

I started teaching in the Globelics Academy. Interacting with doctoral students from across the globe has been the single most tangible benefit that I receive from Globelics. I have come across interesting research themes, methods of analysis and data sources by commenting on the doctoral presentations at the Academy.

Interacting with senior and young scholars. Networking for future possible projects.

Maybe more discussion rounds including researchers below 40 y.o.

Now, the more important is that in the conference I could met an keep in touch we one of the better research group in my area.

Globelics 2010 was an enriching experience for in terms of organization of the conference. As a student, the financial support offered to me was crucial in enabling my participation.

Improvement on my research paper.

Meeting up with people with whom I have started new research projects and coauthored papers.

Globelics provides a unique forum to foster knowledge, research and networking. Its contribution could be strengthened by giving stronger focus to policy issues in comparative perspective.

The financing travel support for participating in the conference has been crucial for me, and I would like to thank for it again.
I think one of the most inspiring characteristics of Globelics is the closeness of people. It is extremely constructive to meet the most influential researchers in the field that can be sharing with us time, ideas and advice in a friendly way.

Vibrant discussions on research with scholars from different disciplines, working on varied country contexts and at different levels of seniority.

I think the Globelics conference does a magnificent job in creating networks. The environment of this event makes it easier for people to connect and that is of utmost importance for researchers.

Good chance to discover the culture of host country.

Interaction with other participant who helped link up to a supervisor for my PhD work.

I've expanded my research contacts and that allowed me to start a PhD course at UNU-MERIT.

I listened to many interesting reports, established networks with some professors, improved my research skills, and discovered new dimensions of my research.

I have met leading researchers, established useful contacts and was able to really feel the wonderful atmosphere of GLOBELICS.

My participation to Globelics conference has allowed improving the quality of my PhD dissertation concerning the methodological issues.

I made strong network with scholars and I also identified some potentials reviewers for my future research work.

Networking, improve knowledge exchange with other countries and cultures.

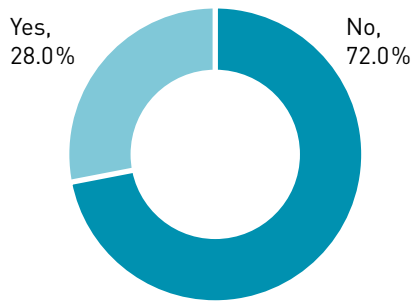
Networking opportunities were definitely a plus also the paper discussants could be a source of future collaboration and publications. Their contact information should be shared with all participants.

Main benefits were: new ideas, peer reviews and networking.

Travel support to attend Globelics- Mexico.

Q29: Are you aware of any programs/projects that work with clusters and under the triple helix model of regional innovations in your country? helix model of regional innovations in your country? (q.29)

	#	%
No	77	72.0
Yes	30	28.0
Answered questions	107	100
Sample: 121		



If Yes, please explain:

"Care Keralam"- Ayurvedic firms cluster in Kerala. In the traditional medical sector the industrial clustering has initiated with the participation of 249 firms, with a funding from government and the industries. This is based on collaborating while competing initiatives. This initiative looks for more output from academia to start the grassroot innovations and help them to develop as a marketable product providing with infrastructural support and later getting the Kerala government standardization and brand name.

A small number of other Hungarian researchers are using these concepts in their work.

Enterprise – University – Government.

I recently participated in an IDRC research project "Towards Innovative, Liveable and Prosperous Asian Megacities".

I am doing a short term consultancy for a project on clusters in Turkey.

I am myself involved in several such projects. These projects are being implemented in the sectors of health, food, women empowerment and rural livelihoods. The ongoing projects do involve a focus on the increased interaction between government, academia and users. However, it may be mentioned that the thrust of triple helix has gone in the direction of coo modifying the knowledge and increasing the control of private sector industry on the knowledge generating organizations. I am not favourably disposed towards such tendencies.

I involve in the innovation group in my origin university in Indonesia. So we discuss a lot about innovation system and how to create the most suitable model to our country.

I know about them from different conferences I attended and papers I read.

In my office, we have initiatives with other government agencies to bring together and revitalize our NIS which for now has a very weak linkage.

Not under the triple helix, but yes clustering programs. There are programs conducted by the Ministry of Industry.

Our faculty is doing a survey about firms in Chengdu High-tech Park.

Our new economic model.

PI-TEC from FONCYT.

Redesist

Research Network on Local Productive and Innovative Systems.

Some students in our centre.

The Argentine Ministry of STI is sponsoring various schemes in this respect.

There are some research project financed by municipal, regional and national government in China.

There is a lot of research in this area in many universities.

There is experience of forming of such clusters in Russia, but he is insignificant.

This continues to be promoted at all levels in my interactions.

University-industry innovation projects financed by Saratov regional government.

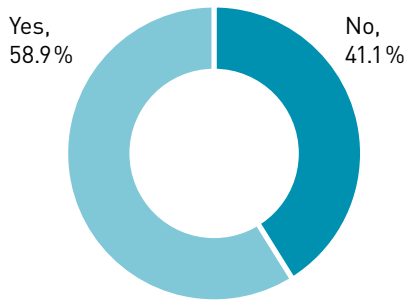
We have done research in support of regional innovation systems in our province, our city and other provinces, using our innovation systems approach.

World Bank sponsored fadama agriculture.

Other networks

Q30: Are you aware of other programs/projects that work to increase linkage and networks between universities, research institutes, government and firms or other users?

	#	%
No	44	41.1
Yes	63	58.9
Answered questions	107	100
Sample: 121		



If Yes, please explain:

African economic research network.

B&ESI – Business & Economics Society International, 64 Holden Street Worcester, MA 01,605–3109, USA Phone: (508) 852–3937, Fax: (508) 595–0089 Email: hkan@besiweb.com Web Site: http://www.besiweb.com

Conferences are been organized every now and then, but we hardly find the Industrialists attending. Our firms need to be attracted and made to find a stake in participating.

DIME – Dynamics of Institutions and Markets in Europe http://www.dime-eu.org/

Education Research Network for central and West Africa.

Establishment of many intermediaries agents to build linkages with SMEs and MNCs.

EU funded grant schemes.

EU research programs, programs of Russiam Ministry of Science and Education.

For example, those promoted by the EC Framework Program.

Global Development Network.

I am currently working with the evaluation of Eureka in Spain and apart from that, the Ministry of Industry also promotes R&D cooperation between agents.

I am not involved but I try to follow up on programs/projects.

I am working on a university-industry linkages project, in the Metropolitan Autonomous University, Mexico.

I know about them from different conferences I attended and papers I read.

IDB

IDRC from Canada Triple Hélix

In Brazil there is a project coordinated by the Professor Wilson Suzigan (UNICAMP) related specifically to the linkanfes between universities, research institutes, government and firms.

In Russia there is the Skolkovo project but it has many drawbacks.

It is my main field of research!

Ministry of Science and Technology, Government of India, New Delhi finances projects on technological change.

New efforts at fostering NSI.

Pan African Competitiveness Forum (PACF), The Competitiveness Institute (TCI)

Policy programmes, various types.

Project grants targeted at it.

Roks

Several Hungarian STI policy schemes support academia-industry co-operation. A small number of other Hungarian researchers are using these concepts in their work.

SLINTEC public private partnership program with the participation of university researchers.

Some government departments work on innovation and development model.

Some innovation programs carried by BNDES (National Bank of economic and Social Development) and FINEP (Research and Projects Financing).

Some World Bank projects.

The African Economic Research consortium

The focus of my study is built upon Science, Technology and Society (STS) literature and there are a lot of intersection between the two.

The IIT-Madras Research Park in Chennai, India.

The is support only for state universities.

The National Council for Science and Technology of my country is promoting university- industry linkages though a program of incentives.

There are different national programs which includes research institute and government. But when comes to including firm and its users, it is little to my understanding.

There are research collaborations funded by IDRC that link universities, government institutions and NGOs.

There are some research project financed by municipal, regional and national government in China.

There is a lot of research in this area in many universities.

There is one on-going project "Innovation Partnership Program" coordinated by the Ministry of S&T of Vietnam and supported by the Ministry of Foreign Affairs of Finland.

Those carring out by FONCYT.

The Universidad del Estado de Mexico is creating linkages between academic and self-employed and small business.

Tripple helix

TUBITAK has specific support programs to foster these activities.

Yes I know that more of such projects are going on in Brazil, South Africa and India.

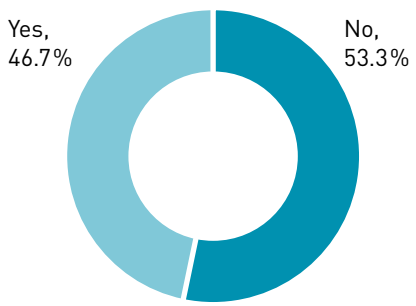
Yes the Economics, Agricultural and Educational ministries all have some activities oriented in this sense, although I do not know the specifics of all of them.

Yes, for example the Society university linkages program, CSIC, University of the Republic. (www.csic.edu.uy in spanish)

Zhejiang university, NIIM

Q31: Are you involved in or studied any triple helix/cluster/university-government-firms linkage?

	#	%
No	57	53.3
Yes	50	46.7
Answered questions	107	100
Sample: 121		



If Yes, please explain:

A World Bank Study on Bulgaria's competitiveness through S&T and innovation.

Already explained that I am involved in both action research and study projects. However, when I am trying to organize, I do try to shape triple helix differently.

Collaboration in higher education: University – University, under supported by government, and doing practical projects (firms).

Have worked on a project on industry- university interaction, coordinated by Prof. Keun Lee globally and in India by Prof. K J Joseph.

I am attending a item on innovation and cluster of IDRC!

I am involved in joint project of Saratov technical university and machine-building plant "Contact".

I am working on above mentioned model on CARe Keralam (Confederation of Ayurvedic Renaissance in Kerala).

I contributed to a study that was done by my colleague on triple helix in Israel and we tried to come up with some suggestions for Ethiopia.

I did a case study in my master dissertation about the productive arrangement of beachwear in a city nearby Rio de Janeiro.

I have been carrying out research on this for over two decades now.

I have been doing research on academy-industry linkages in Mexico for the last two years. There is one recent publication in SPP Vol 37, N.7 and another is coming next February in SPP as well.

I have research project from government about innovation indicators in context EIS.

I have started a BOP hub at my university which will bring corporate partners, govt and our university together to work on business model development to better service low income markets.

I have studied academia-industry co-operation in the framework of several research projects.

I have studied academic-farmers linkages in Mexico (related to the agro).

I have studied university-firm interactions for the past five years, and now extended to embrace university interactions with all forms of external social partners, whether firms, government or civil society.

I studied experience of some cities of Russia.

I studied knowledge production and knowledge transfer in five premier technology institutions – the Indian Institutes of Technology.

I studied university-firms-government linkages and data were collected through interviews with university academics, public officials and technology managers in firms.

I was the former director of the De La Salle University Business Incubator Facility that aims to help start-up businesses through the collaboration of academe, government and industry.

I worked for seven years in the university program to build relationship with the productive sector, now I am on live to finished my PhD thesis, but I hope come back soon.

I'm studying the linkages between firms, universities, government and technological centers in the Argentine cluster of agricultural machine.

In a way in my ongoing PhD work.

In my research, I studied univeristy-government-firms linkage.

Interactions between universities and firms conducted by the Universidad Autonoma Metropolitana, Mexico and other academic institutions worldwide.

Involved with a study on R&D incentives in India in 2003.

I've made various (published and unpublished) contribution and been involved in various projects on university-government-firms linkage. Currently, I am involved in a project on innovation policy additionality which also touches upon this linkage.

My PhD thesis is a comparative case study between China and Switzerland on how institutional environment shape firms' innovator networks. Triple helix relations are my main focus.

My work was based on the cooperation/collaboration agreements made by firms in order to innovate.

On Brazilian aerospace cluster in Sao Jose dos Campos.

Participated in a number of research projects supported by SAREC/Sida such as: (1) Strengthening Vietnam's Technological Capabilities to Enhance Competitiveness and Sustainable Development.(2000–2002): (2) Financing Research and Post-graduate Education in Vietnam (1997–1998); (3) Institutional Reform in the Science and Technology System in the Transition to Market Economy in Vietnam (1993–1995).

Project funded by IDRC on university-industry linkages, we run surveys for researchers and firms on university-industry linkages. We are still working with the results of the surveys.

Relationship between an international aeronautics maintenance firm, with public sector regulatory organization, and investment attraction organization, and university to provide more specific

training for workers. And also to support business development as potential service and parts providers. Research was to support this effort.

Research on university-industry linkage at NISER

Roks

The Uganda fish and flower export sectors.

The whole of my PhD thesis is on the triple helix, infact, my paper was sent and presented at the triple helix conference held in Madrid Spain this year 2010 in October.

We are working on several projects with this topic, for example in software industry.

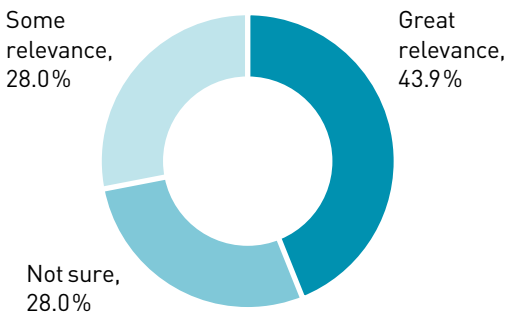
We run the innovation survey in a joint effort among the university, the ministry of science and technology and the Chanber oo industry and other organizations of firms.

Yes, but with another perspective since I base my work on STS.

Yes, I've collaborated to the over mentioned project and I've been studding pharmaceutical industry in Brazil under such perspective.

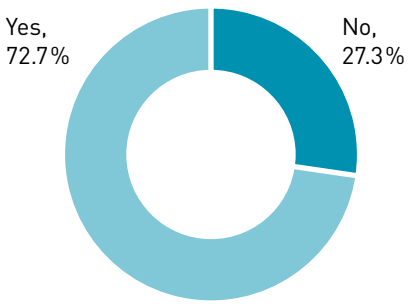
Q32: Based on your knowledge, would you rate the triple helix approach, to be important for your country to support increased innovations for development?

	#	%
Great relevance	47	43.9
Not sure	30	28.0
Some relevance	30	28.0
Answered questions	107	100
Sample: 121		



Q33: Is there any specific action you recommend in your country to increase innovation for development?

	#	%
No	33	27.3
Yes	88	72.7
Answered questions	121	100
Sample: 121		



If Yes, please explain:

Legislation support, tax incentives.

More funding og R&D.

Pathways of development matter. Power relations are also critical to the who-whom of development. Learning for what and who gets strengthened is a key issue which I think needs further consolidation in the policy research activities.

Addressing the knowledge gaps relevant to rural innovations. Learning from the positive local level innovations, emphasis of poverty relevant innovations.

There need to be coordination, participation and networking to increase innovation for development.

Development technologies, adaptation of technologies.

Implementing cooperation between Universities, government agencies and research institutes and create network with other organization from abroad.

Policy advice to public authorities, also on the relevance of research to public policy development in this area.

First to have an Innovation policy not just an S&T policy.

A lot especially from my research work.

More people taking research in the domain. This would bring more stakeholders be it policy makers, academicians, industry personnel and investors to foster innovations.

Further introduce the networks such as Globelics and Asialis.

Lack of government will in enforcing the national innovation policy. Incentives for this will are required for development.

Evidence-based polices.

This is a very broad question; it is not possible to answer it in this survey.

To give the tax concessions to private innovative business.

Promote the linkage of triple helix.

Investment in energy sector to ensure supply of electricity constantly.

Greater collaboration amongst stakeholders.

Le Gouvernement doit de plus en plus intégrer l'innovation technologique de proximité dans son évolution.

Government must emphasize and encourage (give tax concessions, spend directly) research on new technology that directly affects the living standards of poor people and also leads to reductions in pollution and environmental degradation. Government of

India should not be only thinking of copying from the developed countries in this regard.

Promote demand driven R&D projects.

During 2010 we worked in a proposal for a governmental office. A very simple recommendation was: let's get a better communication and interaction between different offices and government levels working to get the same or similar objectives.

Ideas are much, but finance not enough for their realization.

Increase awareness and knowledge.

In Turkey, we do not have an "Innovation Policy", Innovation and innovation systems thinking is not seen as a priority, for example, I believe triple helix is very important but there are other issues such as social capital, trust and also expectations and priorities (different stakeholders) are different.

Spread it to the vast majority of the poor people. If you are implementing it without this, it will further make them no inclusive.

1. Active integration and collaboration between industry and universities. 2. Changing and extending the scope of public research institutes in order to adapt to industry dynamics. For an example gradual development of research scope for downstream activities. 3. Development of awareness in industry on the capabilities of universities. 4. Enhancement of existing informal linkages between university academics and firms to contract research at organizational level.

Organize training the trainers' workshop.

Funding research on innovation as well as providing private sector innovation development services.

There are a large number of STI policy support schemes in place in Hungary. Hence, the major issue is not to introduce new measures, but better policy co-ordination (with other policies affecting innovation processes), improved policy design (using modern decision-preparatory tools {e.g. technology foresight} and policy evaluation) and policy implementation.

Focus more on individual innovators across countries and develop mater plan to promote those innovations through governmental channels.

Formulation of the Innovation Development Board etc.

Codifying the tribal knowledge and strict national property right system.

Not now. Maybe later on.

Through providing the knowledge software and skilled persons.

There should be more formal degree programs on innovation to be offered by the university.

Experiment innovation and more coordination (Yuti,The Netherlands).

Not actually a specific action but a wish that policy makers could understand that innovation is a complex, risky and long term process that should be thought and planned to actually develop in a long time horizon, not a specific political term, the more obvious it seems to be.

Invest in R&D.

Reduce reliance on natural resources as a source of development.

Increasing linkages among university, industry, government and intermediary actors.

Invest.Incentivize.

The first step will be to increase interaction between the government, universities and firms to discuss the importance of innovation. Awareness is crucial.

India has very low proportion of R&D-GDP ratio. She has also very low linkage between institutions and industry. If steps taken to increase R&D-GDP ratio and Institution-industry linkage, it will go a long way to improve the long run economic growth in the economy.

More fair and democratic mechanisms of financial support for research institutions.

Strengthen the interactions universities and firms, using some incentives by the government.

Give people more freedom to speak.

The evolutionary approach of understanding past catch up experiences and the changes circumstances mapped through inductive research.

Pay more attention to PH.D's research!

Increasing the financial schemes for encouraging pro poor innovations is an important aspect.

Strengthen the creation of highly skilled human resources and strengthen the design of science, technology and innovation policies and industrial policies that help to upgrade the capacities of regions within the country.

I would suggest more evaluations of programs. Especially after a few years of being "treated".

The innovation policies must be embebednes in a global development project, especially in education, production and income distri-

bution. We have too much experience of isolate and usefulness policy plans.

There should be more of real-time focus on innovations as far as clean-tech and sustainable technologies are concerned, which is the need of the hour.

Organize international scientific conferences.

To improve policy coordination in the area.

Place more emphasis in program evaluation to increase the effectiveness of innovation support policies.

I think my country should increase resources in developing education, skills and R&D allowing innovation to be shared by everybody.

Increased pro-poor focus. This is already taking place to some extent.

Even though I am based in Spain, I am going to write about the case of my country of origin: Brazil. One of the main problems this country faces regarding innovation for development is not the lack of investment itself (which exists), but the absence of understanding of the country's existing capabilities – this situation creates an environment of mislead investments. Qualitative and quantitative studies on the areas that Brazil has its biggest comparative advantages should be carried out.

Give more support to the development of middle-small firms.

Development of STI policy.

Polices reinforcing the competitive environment.

To use triple helix approach, to attract scientists to do R&D activities, etc.

To promote the capacities develop in firms and other institutions.

Need to start from the scratch.

Improve university /firms relations.

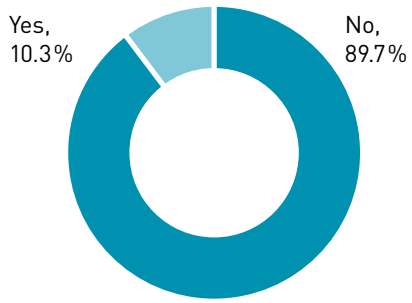
Allocate research funds for research.

Create linkages between the universities and the industry.

Much greater interaction between social science and science, along with local level participation in development projects.

Q34. Is there any other comment that you wish to make here that we may not have asked you about?

	#	%
No	96	89.7
Yes	11	10.3
Answered questions	107	100
Sample: 121		



If Yes, please explain:

The relative mix of Southern to Northern researchers at Globelics aprox. 65 % south, is very important and gives a unique nature to Globelics. Also the increasing linkages with emerging innovation researchers in different parts of the South. Support for their research and future participation is key!

Money can be saved by: + Food: do not exceed demands + Printed material: some do not need, after receiving, participants might throw it, because they cannot carry it to home with limited luggage weight + Accommodation: participants can share room. Stay alone is fine; but if sharing with another is more fun and get closer network.

Thank you for doing very good work. But please put more emphasis on environmental preservation (so much of forests get denuded to achieve economic growth!) and reductions in world poverty through development and use of cleaner technology. (Hrushikesh Panda, India)

Publication of research output.

1. Food and accommodation: Accommodation was excellent. But food was not that adjustable, especially for vegetarian people. 2. It is also found that even though some of the discussants took great effort to read the paper for discussion, some didn't even turn up.

Bengt Ake needs to really reconsider carefully the succession issue on leadership as I haven't found anyone anywhere nearly as capable as him to lead it. He should spend the next few years really seeking and mentoring someone like him.

GLOBELICS must continue its present organizational state- essentially a sort of informal organization. It must strengthen the Globelics Academy so that students can be trained for a little longer period.

Why do you asked several times for the Triple Helix approach? Is not a suggestion is a curiosity, sorry.

Since Globelics can have many scholars so should arrange a short session for PhD students how to carry out effective innovation research and write papers.

Annex: Additional Persons Met with and Interviewed

Persons met outside the countries in the portfolio and/or with additional inputs to the process, normally not listed within the case studies.

	Name	Affiliation
	Management Group	
1	Johan Åkerblom	Sida – AKTSAM
2	Mikael Söderbäck	Sida – ECOP
3	Per-Einar Tröften	Sida – HUK
4	Stefan Molund	Sida – UTV
	Reference Group	
5	Gang Zhang	OECD
6	Michiko Iizuka	UNU-MERIT
7	Sylvia Schwaag Seger	VINNOVA
8	Tony Marjoram	UNESCO
	Consultation Group	
9	Dr. Freddy Aleman	IU Nicaragua
10	Dr. Burton Mwamila	ISCP-Tz
11	Prof. Nawangwe Barnabas	ISCP-Ug
12	Dr. António José Cumbane	ISCP-Mz
13	Dr. Eduardo Zambrana	Bolivia
14	Dr. Seyoum Leta	Bio-Earn/Bio-Innovate

	Name	Affiliation
	Stockholm	
1	Afzal Sher	Sida
2	Dan Sjögren	VINNOVA
3	Gity Behravan	Sida
4	Inger Lundgren	Sida
5	Johan Åkerblom	Sida
6	Maria-Teresa Bejarano	Sida
7	Pernilla S. Rafiqui	Sida

	Name	Affiliation
8	Robert Nygard	Sida
9	Sari Scheinberg	
10	Stefan Molund	Sida
11	Tomas Kjellqvist	Sida
12	Zinaida Iritz	Sida
	Lund University	
13	Bo Göransson	RPI
14	Bo Mattiasson	Biotechnology
15	Claes Brundenius	RPI
16	Jens Sörvik	RPI/CIRCLE
17	Lena Trojer	BTH
	Brighton	
18	Andrew Barnett	Policy Practice
19	Erika Kraemer	Brighton University
20	Geoffrey Oldham	STEP
21	Martin Bell	STEP
22	Bengt-Åke Lundvall	Globelics, Paris

Evaluation of Sida's Support to Innovation Systems and Clusters, a Research Cooperation Initiative

Individual cases

This evaluation report provides an overview of ten programs in the areas of Innovation Systems and Cluster initiatives supported by Sida's Unit for Research Cooperation. The evaluation was commissioned with the objective to draw strategic knowledge from the innovation programs supported by Sida. The evaluation assesses the portfolio as a collection of "ways of working" within scientific research cooperation programs. The report highlights that support and investment in Innovation Systems can be excellent means for encouraging the use of research as a tool for development.

The report was carried out by an independent evaluation team, and it is presented in two volumes; a Main Report, which focuses on the portfolio in general, and a Collection of Individual Cases, which contains more detailed information.

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