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1. EXECUTIVE SUMMARY

1.1 Context and Objectives

The ICT environment in Africa is changing rapidly with improved infrastructure and increased awareness of the need to support entrepreneurship and research that is focused on addressing socio-economic challenges. ICT and Innovation related projects are initiated in many different ways and funded by a range of actors including national governments (either on a bilateral or multilateral basis), international organisations, foundations and non-governmental organisations (NGOs), and by the European Commission through the Framework Programme (FP7, Horizon 2020) and European Development Funds (EDF). Since the project "owners" are quite diverse and there is often limited sharing of information in the normal course of events, there is significant data fragmentation at national and regional levels. This raises challenges in terms of implementing a coherent approach to address national priorities, having a clear picture of what has been funded in the past and what lessons have been learnt and what types of projects could be adapted and replicated in other African Member States for greater socio-economic impact.

As a result the IST-Africa Consortium has undertaken a longitudinal study in the 17 participating African countries across North Africa (Egypt, Tunisia), West Africa (Senegal), East Africa (Burundi, Ethiopia, Kenya, Tanzania, Uganda), Central Africa (Cameroon) and Southern Africa (Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, South Africa, Eswatini) since 2009 to provide a comprehensive report that showcases ICT and Innovation related bi-lateral or multi-lateral projects.

The purpose of this study is to raise awareness of the range of ICT and Innovation related projects and activities across Africa to facilitate better coordination and collaboration and assist in the identification of projects that could be replicated or scaled up in other African countries. It focuses on current ICT and Innovation related bilateral and multilateral cooperation with the 17 IST-Africa Partner Countries and Europe, but also between these African States and other key stakeholders. Where appropriate, it also reflects multi-country projects where at least one of the beneficiaries is an IST-Africa Partner Country.

It focuses primarily on ICT and Innovation related bilateral or multilateral projects funded by governments, development agencies or international institutions due to the limited resources available for this task. However, where particularly successful national or regional projects funded
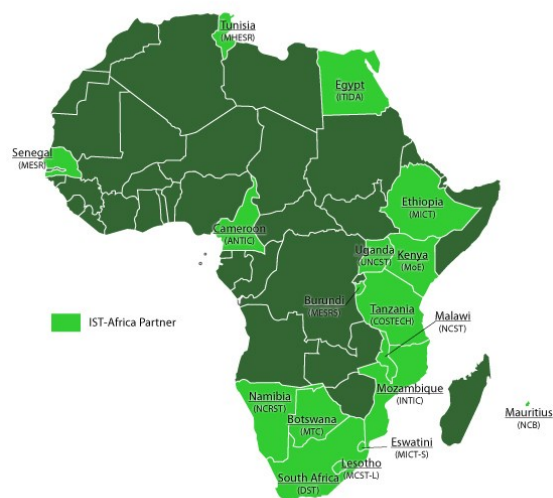
by other stakeholders are brought to the attention of contributors, these will be included in the next iteration of the study.

As most projects have a fixed duration, this study requires regular updating. While IST-Africa Partners have taken care in identifying relevant projects, irrespective of funding, since this is a living document, we invite key stakeholders (including beneficiaries and donors) to bring other relevant projects to our attention, to be incorporated into the next version.

1.2   Methodology

This study builds on a body of knowledge collected by IST-Africa Partners during 2009 – January 2016.

The research to update this report was undertaken during July - December 2018 to reflect more recent developments. The methodology leveraged desk research, qualitative data collection complimented by interviews with key stakeholders in Botswana, Burundi, Cameroon, Egypt, Ethiopia, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Senegal, South Africa, Eswatini, Tanzania, Tunisia and Uganda, supplemented by follow up e-mails and telephone calls where appropriate.

This report is complemented by two other IST-Africa reports entitled "Report on Innovation Spaces and Living Labs in IST-Africa Partner Countries", January 2016, ISBN: 978-1-905824-49-6 and "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018", ISBN: 978-1-905824-58-8.

1.3   Main Findings

Bilateral cooperation support for ICT, Innovation and Research Capacity building in an African context is primarily provided by Finland, Sweden, Norway, Germany, Italy, France, Switzerland, Ireland, Netherlands, UK, Belgium, Portugal, India, South Korea, Republic of China on Taiwan, China, Canada and Japan. Multilateral support is primarily provided by the European Commission, African Development Bank, World Bank, ITU, IICD, UNDP and UNESCO.

Diagram 1 below provides a visual representation of some of the donors supporting ICT, Innovation and Research capacity in IST-Africa Partner Countries.

Diagram 1: Mapping of Donors supporting ICT, Innovation and Research Capacity in IST-Africa Partner Countries

Bilateral/Multilateral Cooperation with IST-Africa Partner Countries

Tunisia
- European Commission (FP7, H2020, AfricaConnect 2)
- France (Hubert Curien Partnership Exchanges)
- Germany (BMZ - Renewable Energy 2003 - 2013)
- South Africa (Bilateral STI Agreement)

Egypt
- European Commission (ENPI, FP7, H2020, AfricaConnect 2)
- France (La Poste France - Twinning Project 2007)
- Germany, Italy (Twinning Project - AGCOM & BNETZA 2008 - 2011)
- Italy
- UNDP
- Finland
- Poland
- Sweden

Senegal
- European Commission (FP7, H2020, EDF11, AfricaConnect 2)
- China (Intranet component, eGovernment project)
- France (SIST Project 2008; Démarches administratives project)
- Germany (Cooperation on Renewable Energy and Energy Efficiency)
- India (Hub Earth Station infrastructure)
- Switzerland (SDC - Community Multimedia Centres, CoseLearn project)
- South Korea (WIMAX Component eGov project)

Ethiopia
- European Commission (FP7, H2020, EDF10, EDF11, AfricaConnect)
- Belgium (VLIR-IUC Cooperation Programme)
- Germany (Applied Entrepreneurship Education Program 2013 - 2016: BMZ, DAAD, HNU)
- Netherlands (IICD)
- South Korea (eGovernment project, Information Access Centre)
- Switzerland (Young Entrepreneur Exchange Project: Bern Univ)
- USA (MSc in Health Monitoring and Evaluation: Tulane University)

Uganda
- European Commission (FP7, H2020, EDF11, AfricaConnect, ACP-ICT)
- China (National Data Transmission Backbone Infrastructure)
- Ireland (Irish Aid: Partnership for Research Capacity Building 2008 - 2011)
- Netherlands (Nuffic ICT Infrastructure & Capacity building projects 2006 - 2012; IICD eLearning projects 2010 onwards)
- UK (British Council - Mobile Innovation & Enterprise project)
- Norway (NORAD - Makerere University Infrastructure projects)
- Sweden (SIDA - Makerere University Infrastructure & Research Cooperation; SPIDER eLearning & Governance projects)
- South Korea (eGovernment Roadmap & Master ICT Plan)

Kenya
- European Commission (FP7, H2020, EDF11, AfricaConnect, ACP-ICT)
- France (Research Cooperation: IRD, IFRA, CIRAD)
- Germany (BMZ - ict@innovation project 2008 - 2010)
- Spain (Technical Cooperation)
- Sweden (SPIDER Projects, ongoing)
- Netherlands (IICD, Nuffic Fellowship Programme)
- United Kingdom (Technology Transfer, British Council, Universities)

Cameroon
- European Commission (FP7, H2020, EDF10, EDF11, AfricaConnect 2)
- China (Infrastructure)
- Germany (GIZ)
- World Bank

Burundi
- European Commission (FP7, H2020, EDF11)
- Belgium (Education cooperation)
- France (Education, PARES project 2007 - 2012)
- Germany (Infrastructure projects)
- India (Pan-African eNetwork Project)
- ITU (Broadband Wireless Network Project 2009 - 2014, National CIRT Establishment 2013)
- World Bank (Regional Communications Infrastructure Project, 2007 - 2016)

Angola
- European Commission (FP7, H2020, EDF11)
- Portugal (Bilateral STI Agreement)
- South Africa (Bilateral STI Agreement)
- Norway (NORAD)
- Germany (BMBF)
- France
- Spain
- Switzerland (SER)
- Canada (IDRC)

Tanzania
- European Commission (FP7, H2020, EDF10, EDF11, ACP-ICT)
- Finland (MFA Finland, CSBKE 2010 - 2012; Information Society Development Programme 2009 - 2010; TANZICT 2011 - 2016)
- Germany (BMZ - ict@innovation project 2008 - 2010)
- Ireland (Irish Aid - Young Scientists Tanzania)
- Netherlands (IICD)
- Norway (NORAD - Health Informatics Programme)
- Sweden (SIDA / SPIDER projects)
- United Kingdom
- Denmark
- World Bank

Malawi
- European Commission (FP7, H2020, EDF10, EDF11, AfricaConnect)
- Australia (Global Future Charitable Trust - National Library Services Project)
- China (eGovernment project 2013 - 2018)
- Germany (BMZ - ict@innovation project 2008 - 2010)
- India (Pan-African eNetwork Project)
- Netherlands (IICD)
- Norway (ICT Training 2008 - 2012)
- Scotland (eGovernment website and Training)
- UNDP (Development of Master ICT Plan)
- UK (IDS - National Information Repository project 2011 - 2012)
- World Bank (Regional Communications Infrastructure Program/Infrastructure)

Namibia
- European Commission (FP7, H2020, EDF10, EDF11, AfricaConnect, ACP-ICT)
- Finland (MFA Finland, SAIS Programme 2011 - 2015)
- Germany (BMZ - ict@innovation project 2008 - 2010)
- India (Pan-African eNetwork Project)
- South Africa (Bilateral STI Agreement)

Botswana
- European Commission (FP7, H2020, EDF11, ACP-ICT)
- Finland (MFA Finland, SAIS Programme 2011 - 2015)
- Germany (Development Support up to 2007; Regional Climate Change project (BMBF))
- Sweden (SIDA, Botswana Speaks Pilot 2012 - 2014)

Mozambique
- European Commission (FP7, H2020, EDF11, AfricaConnect, ACP-ICT)
- Finland (MFA Finland - CSBKE 2010 - 2012; STIFIMO Project 2010 - 2014; SAIS Programme 2011 - 2015)
- Germany (BMZ: Mobile Banking in Rural Areas project, ict@innovation project 2008 - 2010)
- Italy (MFA Italy - Government Electronic Network 2010 - 2013)
- Norway (SISTAFE Project)
- Portugal (Bilateral STI Agreement)

Swaziland
- European Commission (FP7, EDF10, EDF11)
- India (EXIM Bank of India - IT Park)
- Japan (JICA - Education & Training)
- Republic of China/Taiwan (Royal Science and Technology Park)
- UNESCO (Development National STI Policy)

Mauritius
- European Commission (FP7, EDF10, EDF11, ACP-S&T)
- African Development Bank (Review of National ICT Strategic Plan 2007 - 2011)
- Canada
- World Bank
- France (AFD, Consultancy to assess connecting Rodrigues to submarine fibre cable)
- India (Cyber City, IT Education projects)
- United Nations (SPP capacity building project)

South Africa
- European Commission (Multiannual Indicative Programme with South Africa, FP7, H2020, AfricaConnect)
- Finland (MFA Finland, SAFIPA Programme 2008 - 2011; CSBKE 2010 - 2012; COFISA Programme 2006 - 2010; CSIRT 2009 - 2010; INSPIRE 2008 - 2010)
- France (Bilateral STI Agreement)
- Germany (BMZ - ict@innovation project 2008 - 2010)
- Italy (Bilateral S&T Agreement)

Lesotho
- European Commission (FP7, EDF10, EDF11, ACP-ICT)
- African Development Bank (eGovernment Infrastructure Project 2014 - 2017)
- Ireland (Education)
- Italy (OCCAM - eHealth project 2011 - 2013)
- Germany (Capacity Building, DED/GIZ)
- ITU (Broadband Wireless Network Project, CyberSecurity Project - 2016; HIPSSA Project)
- South Africa

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Finland actively supporting Innovation Capacity Building in South Africa, Mozambique, Tanzania. Regional Programme in Southern Africa

The **Ministry of Foreign Affairs of Finland** (MFA) primarily focuses on supporting Innovation capacity building. Finnish Programmes are based on a needs assessment agreed with the beneficiary national government, implemented by a small technical support team from Finland in cooperation with a local team established by the hosting Ministry. They focus on building national institutional capacity. A number of projects were undertaken in **South Africa** between 2006 - 2011: SAFIPA Programme (2008 – 2011 €3 million), COFISA Programme (2006 – 2010 €3 million), Establishing National CSIRT Capacity for South Africa (2009 - 2010 €280k) and INSPIRE Programme (2008 - 2010 €4.07 million).

Based on the lessons learnt from these Programmes four **regional** African projects were launched - *Creating Sustainable Business in the Knowledge Economy* (focused on improving capacity in Sub-Saharan business incubators in mobile application development, with pilots in **Tanzania, Mozambique and South Africa**, 2010 - 2012, €3.3 million, partners included InfoDev and NOKIA); *ALICT - African Leadership in ICT* (focused on provided blended learning course with Professional Development Certificate in **Botswana, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Uganda and Zambia**, 2010 - 2014, €3 million); *Southern Africa Innovation Support Programme*[1] (focused on supporting a regional innovation system in SADC and promoting collaboration in relation to Innovation systems between **Botswana, Mozambique, Namibia and Zambia**, 2011 - 2015 €6.2 million) and *Southern Africa Innovation Support Programme (SAIS 2)* (focused on supporting new businesses through strengthening innovation ecosystems in **Botswana, Namibia, Tanzania, South Africa and Zambia**, 2017 - 2021, €9.3 million).

The STIFIMO Programme was launched in **Mozambique** to enhance the national Science, Technology and Innovation system (2010 - 2014, €22 million).

Leveraging the success stories from the SAFIPA Programme, the Information Society and ICT Sector Development Programme (2009 - 2010 €500k) prepared the way for the TANZICT Programme, which focused on strengthening the **Tanzania** Information Society and Innovation ecosystem (Sept 2011 - August 2016, €5 million). The preparation has been undertaken for the TANZIS Programme, which will focus on continued support to the Tanzania Innovation ecosystem.

Finland has launched an Accelerated Growth Programme in Zambia to support the development of micro, small and medium enterprises in cooperation with the Ministry of Commerce, Trade and Industry (2018 - 2021, €9 million).

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[1] www.saisprogramme.com

Box 1: TANZICT The Information Society and ICT Sector Development Project in Tanzania (2011 - 2016)

TANZICT was a bilateral project with the Government of Finland, funded by Ministry of Foreign Affairs of Finland and hosted by COSTECH (Tanzania Commission for Science and Technology - national IST-Africa Partner). It was designed to specifically support strengthening of the Innovation ecoystem by a) Supporting the revision of the National ICT policy (2003) and designing an Implementation plan; b) strengthening institutional capacity in the Ministry of Communications, Science and Technology and c) creating a Tanzanian Innovation Programme. This pragmatic approach addresses capacity building, policy development and implementation.

The Innovation Programme had a high impact as it addressed real needs for the   emerging tech community. An Innovation Space (Buni Hub) focused on pre-Incubation was opened in COSTECH in October 2011, a 3-month training programme for women entrepreneurs (FEMTANZ) was developed and implemented (2012), Living Labs were supported across the country and an ICT Innovation Fund launched in 2012 to provide seed funding to develop a prototype or pilot a service. Four calls were launched with forty one grants provided.

These activities actively supported young entrepreneurs who needed structure, co-working space, business, technical and financial support to kick start their innovations. It created an active community of collaborators. TANZICT collaborated with the KINU Innovation Hub in Dar es Salaam and Dar Teknohama Business Incubator to organise community and training events and as well as hosting projects funded under the Innovation Fund.

Box 2: African Leadership in ICT (ALICT)

ALICT was funded by the Ministry of Foreign Affairs of Finland (MFA) under the first Action Plan of the 8th Africa- EU Strategic Partnership with initial funding of €3 million (2010 - 2013) to develop and implement an eight month certified ICT Leadership Training Programme.

The course was developed by GESCI using a blended learning approach around an Introduction to the Knowledge Society and 6 modules: Leadership in the Knowledge Age; New Strategies for Science, Technology and Innovation; Telecommunications Infrastructure & Quality Internet Provision; ICT Applications and the role of Government; Education in the Knowledge Age and Knowledge Society for Africa. Participants were expected to allocate 15 hours per week for online activities and offline self study over an eight-month time period.

Certification was well developed offering a range of options including the opportunity to continue studies. Upon completion of the course a Professional Development Certificate in African Leadership in ICT (AUC/ MFA/GESCI) was awarded. Participants could also choose to register for the concurrent award of Graduate Diploma in Leadership Development in ICT and the Knowledge Society awarded by Dublin City University (Ireland). Participants awarded a graduate Diploma have the option to continue working towards a Masters degree.

During Phase 1 (2010 - 2013) the course was available to participants from 12 countries across Eastern and Southern Africa (Botswana, Ethiopia, Kenya, Malawi, Mauritius, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Uganda and Zambia) as well as staff from the African Union Commission. In July 2013 213 mid-to-senior level Government officials graduated of which 130 opted to also receive the Graduate Diploma in Leadership Development in ICT and the Knowledge Society from Dublin City University (Ireland).

Phase 2 commenced in May 2014 focused on the initial 12 countries plus Ghana. During 2014 302 participants were enrolled out of 747 applicants.

This blended learning certified course had addressed an identified skills gap as well as supporting knowledge sharing among participating civil servants across regions of Africa. Feedback provided by IST-Africa Partner representatives who completed ALICT was positive.

Box 3: Southern Africa Innovation Support Programme (SAIS 2) 2017 - 2021

SAIS 2 is a regional Innovation Support Programme between the Government of Finland, funded by Ministry of Foreign Affairs of Finland and Ministry of Infrastructure, Science and Technology, Botswana; Ministry of Higher Education, Training and Innovation (Namibia); Ministry of Education, Science and Technology, Tanzania; Ministry of Higher Education, Zambia; Department of Science and Technology, South Africa and the Southern African Development Community (SADC) Secretariat. It builds on the outcomes from SAIS (2011 - 2015) and focuses on supporting the growth of new businesses through strengthening innovation ecosystems and promotion of cross-border collaboration between innovation players in Southern Africa.

The Innovation Fund awards grants for locally implemented projects in the five partner countries. Twelve projects were funded under the first Call in 2018 focused on cross border projects to support development of institutional capacity for regional innovation cooperation; Scaling Enterprises through stronger Innovation Support organisations and Improving enabling environment for inclusive activities in the region. It is developing capacity building programs for Innovation Fund grantees.

It supports Connected Hubs to share best practices in innovation support through online and offline training sessions. It organised the Annual Southern Africa Innovation Forum during 2018 to support networking and knowledge exchange.

Sweden supporting eInfrastructure, Research and mainstreaming of ICT in Education

Sweden provides support through bilateral programmes funded by **SIDA** in programme countries and grants provided by **SPIDER** (eDemocracy, eLearning, Open Access projects in **Kenya, Tanzania and Uganda**). In **Uganda** SIDA has provided direct support to Makerere University to incorporate ICT and support research and postgraduate training. In **Tanzania** SIDA has supported programmes for ICT for Rural Development, Mainstreaming of ICT in Ministry of Education, Teacher Training Colleges, Secondary Schools and Open University, Regulatory Support and Research Cooperation. In **Botswana** SIDA supported a Parliamentary Initiative leveraging ICT (Botswana Speaks[2], 2012 - 2014).

Box 4: SIDA Investment in Research Infrastructure in Uganda

Swedish International Development Cooperation (SIDA) has been supporting research cooperation and research capacity building with Makerere University, Uganda since 2000. This has been undertaken through PhD and Masters training, assisting the University to incorporate ICT in all its functions and supporting the development of physical and virtual infrastructure.

A lot of progress has been made including supporting over 196 Ph.D. students and 40 Masters Students, creating Centres of Excellence in Health, Agriculture, Energy and ICT as well as implementing a fibre optic network across the campus. All of these activities strengthen local capacity to undertake research and participate in cross-border collaborative research and innovation projects.

During the current phase (2015 - 2020) the focus is on improving the research infrastructure, strengthening local PhD training in public universities in Uganda and increasing the generation and dissemination of research and research outputs through the participation of multidisciplinary teams.

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[2] http://www.botswanaspeaks.org/

Norway supporting eInfrastructure, Research and Capacity Building

Norway provides support through **NORAD** in programme countries. In **Malawi** NORAD provided training to ICT officers and support to the government sector from 2008 - 2012 and also provides funding and support through a cooperation programme between University of Malawi and University of Malawi. In **Mozambique** support was provided to the SISTAFE Public Financial Management Report from 2002 - 2009 and in **Uganda** significant support to the ICT Department in Makerere University. In **Tanzania** NORAD and the University of Oslo has provided support in relation to the Health Informatics System (DHIS) with financial support from the Embassy of Norway and setting up a Masters Programme in Health Informatics in cooperation with University of Dar es Salaam, School of Informatics and Communication Technologies and Muhimbili University of Health and Applied Sciences, School of Public Health. In **Angola**, NORAD funded a research cooperation programme focused on resource policy analysis as well as supporting research, clean energy and fisheries.

Box 5: ict@innovation (Germany)

The German Federal Ministry of Economic Cooperation (BMZ) provided initial funding of €1.6 million for the ict@innovation regional project from 2008 - 2010.

ict@innovation focused on supporting African Small and Medium sized ICT enterprises to use Free and Open Source Software (FOSS) by spreading FOSS business models for enterprises, fostering FOSS certification and supporting innovative local FOSS applications for social and economic development. The project targeted Eastern and Southern Africa (Kenya, Malawi, Mozambique, Rwanda, South Africa, Tanzania, Uganda, Ethiopia, Namibia, Zambia).

Partners included the Partnership of FOSSFA (Free Software and Open Source Foundation for Africa) and InWEnt - Capacity Building International on behalf on behalf of German Federal Ministry of Economic Cooperation (BMZ), the Open Society Initiative for Southern Africa (OSISA). The project ran from 2008 - 2012 and provided practical capacity building and awareness raising.

Germany supporting Education, Capacity Building, Renewable Energy and Infrastructure

Germany provides support through KfW and the German Federal Ministry of Economic Cooperation (BMZ) for Education and Entrepreneurship in **Ethiopia** (direct cooperation between Arba Minch University and Neu-Ulm University of Applied Sciences Germany), Renewable Energy and Energy Efficiency in **Tunisia** and **Senegal,** Interconnection of Electricity Grids in **Burundi (**Regional Initiative), ICT infrastructure for Education and Capacity Building, climate change and renewable energy in **Uganda**, Research focused on Climate Change in **Botswana**, and Rural Infrastructure in **Lesotho**, ict@innovation Open Source Regional Programme (2008 - 2012 in **Kenya, Malawi, Mozambique, Rwanda, South Africa, Tanzania, Uganda, Ethiopia, Namibia, Zambia**, €1.6 million), and Mobile Banking in Rural areas project in **Mozambique** and **Ghana** (€9.5 million Ghana, €2 million Mozambique). In **Cameroon**, DED, GIZ and KfW funded seconded experts for a Health Programme (SWAp Health), programme for the support of decentralisation and local development projects (PAADL) and creation of a social and scientific research centre in Yaoundé to the tune of €49 million. BMBF supported the establishment of the "Southern African Science Service Center for Climate Change and Adaptive

Land Management" (SASSCAL) in association with **Angola**, **Botswana**, **Namibia**, Zambia and **South Africa**.

Italy supporting Governance, eHealth and Innovation

Italy primarily focuses on Governance and eHealth. In **Mozambique** the Ministry of Foreign Affairs funded the Government Electronic Network Phase 1 (2010 - 2013 €4.8 million). It is supporting the implementation of Phase II from 2019. It is also supporting projects focused on Digital Inclusion and Cybersecurity in **Mozambique**. In **Egypt** the Italian Debt for Development Swap Program funded ICT projects for Technical Education, SMEs and Modernising Industrial Schools using ICT. In **Lesotho** a project focused on an ICT Village in the community of Mahobong addressing food security, health and education was supported through OCCAM (2011 - 2103). Some other activities (such as the Maputo Living Lab) were funded by specific Municipalities in Italy.

Box 6: eGovernment Network in Mozambique (Italy)

The Ministry for Foreign Affairs, Italy funded the expansion of the Government network in Mozambique from 2010 - 2013 with funding of €4.8 million through Italian Cooperation.

The initial Government network was put in place with support from the Italian Government in 2004, connecting some public institutions at central level and providing internet access. From 2005 to 2009 the network was extended to all provincial capitals.

The network was further extended to all 128 districts from 2010 - 2013. The project also strengthened government capacity building programs and provided applications through which services will be delivered using electronic tools. The project assisted in improving the organization and efficiency of the public administration.

The next phase of Genet will commence with support through Italian Cooperation in 2019 focused on training local technicians and providing digital literacy training to district officials.

France supporting Education, Capacity building and eInfrastructure

France has supported two regional projects in **Burundi, Rwanda and DRC** (PARES and Great Lakes Inter-University Network); SIST (Information System for STI research, thesis and publications) and Demarches (Website to access administrative information) in **Senegal**; Twinning project between **Egypt** Post and Le Poste; Huber Curien Partnerships (Scientific and Technological Exchanges and Research funding) in **Tunisia**; Francophone Distance Education Masters (AUF, OIF) in **Burundi**, Postgraduate Scholarships through IRD, IFRA and CIRAD in **Kenya,** a Bilateral STI Agreement with **South Africa** and is supporting Consultancy to assess connecting Rodrigues to submarine fibre cable in **Mauritius**. In **Angola**, support has been provided for healthcare research and discussions are ongoing in relation to research cooperation in the areas of energy and water, education and technology transfer.

Switzerland supporting Capacity Building and Entrepreneurship

Switzerland supported Community Multimedia Centres and CoseLearn (Virtual Campus) in **Senegal**, Young Entrepreneur Exchange Project in **Ethiopia** (Hawassa and Bern Universities) and access to Scholarships through the State Secretariat for Education, Research and Innovation for **Angolans**.

Ireland supporting Innovation and Research Capacity Building

Ireland provides Education and Health support through Irish Aid in **Lesotho**, **Ethiopia**, Young Scientist (**Tanzania**) and Partnership for Research Capacity Building (Makerere University, **Uganda** and Irish HEIs).

Box 7: Young Scientist, Tanzania (Ireland)

The Young Scientist Technology Exhibition has been running in Ireland for more than 40 years as an annual hands on Science event and competition for secondary school children to encourage engagement with Science, Technology, Engineering and Maths (STEM).

In 2010 the Young Scientist event was launched in Tanzania as a mechanism to improve science education in schools. The YST outreach team provided mentoring to schools, teachers and students on the principles of context based learner centered scientific research.

The first Exhibition took place in Dar es Salaam in October 2012 and the seventh anniversary took place in August 2018. It has received support from Irish Aid and Pearsons.

This initiative is providing practical support to improving the teaching of science by assisting secondary schools to identify and prepare projects for inclusion in the competition process. Winning teams have the opportunity to travel to Dublin, Ireland with their teacher to visit the BT Young Scientist and Technology Exhibition the following January, thus increasing the knowledge exchange between Ireland and Tanzania.

UK supporting Governance and Innovation

The UK primarily provides assistance through central budgetary support, Governance projects and has supported the National Information Repository Project in **Malawi** and Mobile Innovation & Enterprise project through the British Council in **Uganda**. Scotland provided assistance for the development and training for the Government website in Malawi. UKAid is supporting the Human Development Innovation Fund[3] in Tanzania.

Box 8: Human Development Fund, Tanzania (UK), 2013 - 2020

The Human Development Fund was launched in 2013 with £39.4 million in funding to support innovation and market-driven solutions that have the potential to create social impact in education, health and water, sanitation and hygiene (WASH) across Tanzania. It implements: strategies and interventions to strengthen the national innovation ecosystem; grant mechanisms to support projects through the Innovation Fund and activities to strengthen the innovation evidence base in Tanzania.

The HDIF Innovation Fund has run three Innovation Challenges since 2013 funding 43 projects addressing Health, Education and WASH across Tanzania.

HDIF organises an Annual Innovation Week in Dar es Salaam in cooperation with COSTECH.

Netherlands supporting Capacity Building and Education

The Netherlands supports Nuffic Fellowship Programme in **Uganda and Kenya**, ICT Capacity Building in Uganda (Makerere University) and Education Programme support in **Namibia**. **IICD** supported practical projects in the areas of eHealth, eAgriculture and Technology-enhanced Learning in **Ethiopia**, **Kenya**, **Malawi, Tanzania** and **Uganda** through the Connect4Change Consortium (IICD, Akvo, Cordaid, Edukans and ICCO) from 2010 - 2015 with financial support from the Ministry of

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[3] http://www.hdif-tz.org

Foreign Affairs of the Netherlands.

Belgium supporting Capacity Building

Belgium has supported capacity building in **Burundi** and **Ethiopia** (VLIR-IUC Cooperation programme).

Portugal has bilateral Science Technology and Innovation Agreements with **Angola** and **Mozambique**. Portugal is also supporting digital certification in **Mozambique**.

Portugal - bilateral STI Agreements with Angola and Mozambique

Pan-Africa eNetwork Project (India)

India's Pan-Africa eNetwork Project provided video conferencing technology and access to remote lectures in a number of countries including Burundi, Malawi, Namibia and Senegal as well as Scholarships and Technology Transfer. In Mauritius, India has provided funding to develop the Cyber City and IT Education projects.

South Korea supporting eGovernment

South Korea supported the **Uganda** eGovernment Roadmap and Master ICT Plan and establishing Information Access Centres and an advisory service for projects on the e-office service, the Government Integrated Data System project in **Ethiopia** ($300k, commenced in December 2013), and the Wimax component of the eGovernment project in **Senegal.**

The Republic of China on Taiwan is providing funding towards the Technology Park in **Eswatini** (formerly known as Swaziland).

Taiwan supporting eInfrastructure

China supporting eGovernment

China is supporting the eGovernment Programme in **Malawi** (€135 million), the initial phases of the National Data Transmission Backbone Infrastructure (NBI) and the Electronic Government Infrastructure (EGI) in **Uganda**, National Backbone development in **Cameroon**, and has provided support to the intranet component of the eGovernment project in **Senegal**.

Canada (IDRC) is supporting research on health, environment and education in **Angola** and a project focused on Open Knowledge in **Mauritius**.

Canada supporting Research

Japan is providing capacity building support including training in **Eswatini**.

AfB supporting Infrastructure and eGovernment

The African Development Bank provides loans for infrastructure and policy development including the eGovernment Infrastructure Project (2014 - 2017) in **Lesotho**, Review of National ICT Strategic Plan 2007 - 2011 in **Mauritius** and the Higher Education Support Project in **Malawi** (2017 onwards).

The World Bank provides loans focused on Infrastructures and developing Higher Education Institutions such as the **eGhana** project (€42 million 2006 - 2014), Regional Communications Infrastructure project (**Burundi, Kenya, Madagascar**, **Malawi** €201.9 million, 2007 - 2016), the Science, Technology and Higher Education Program in **Tanzania** ($100 million, 2008 - 2014, additional $15 million 2014 - 2016), Tanzania Education and Skills for Productive Jobs Program in Tanzania ($120 million,

World Bank supporting Infrastructure, Open Data and Education

2016 - 2021), Rural Electrification Expansion Program Tanzania ($220 million, 2016 - 2022), eGovernment Intranet project in **Senegal**, and Open Data Readiness Assessment (ODRA, 2014 - 2015) in **Mauritius**.

ITU supporting techical support, Cyber Security planning
ITU provides technical support in relation to Broadband Wireless Networks (**Burundi**, 2009 - 2014; **Lesotho**), establishing National Computer Incident Response Teams (Burundi 2013 - 2015), Cyber Security Project (Lesotho up to 2016), Digital Migration and Harmonisation of policies and regulatory guidelines (HIPSSA project "Support for Harmonization of ICT Policies in Sub-Saharan Africa").

UNDP supported the development of the Master ICT Plan in **Malawi** and a joint Information and Communication Technology Trust Fund (ICT-TF) with the Ministry of Communications and Information Technology in **Egypt**.

UNESCO supported the development of the National Science, Technology and Innovation Policy in **Eswatini**.

South Africa has bilateral Science Technology and Innovation Programmes in place with a number of other African Member States including Angola, Namibia and Tunisia. Joint Research Calls have been undertaken with Angola and Namibia in recent years with some ICT-related projects being selected for co-funding.

European Commission
The **European Commission** provides support through European Development Funds (EDF), Framework Programme Research Grants (FP7, H2020), ACP-ICT capacity-building programme 2009 - 2011, Africa Connect and AfricaConnect 2.

FP7 Research funding of €171.5 million to 45 African Member States
Under **FP7** there was a considerable increase in participation from African Member States in funded projects, which reflected the opening up of International Cooperation across all instruments and a number of specific thematic calls focused on research cooperation with Africa (Africa-2010 Call). Research research funding of €171.5 million went into African research institutions in 45 African Member States[4] based on competitive proposals including European and African partners. Diagram 2 below outlines the leading African countries in terms of funding secured during FP7:

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[4] FP7 projects included participation from 45 African Member States: Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Cameroon; Cape Verde; Central African Rep.; Congo; Congo (DRC); Cote d'Ivoire; Egypt; Ethiopia; Gabon; Gambia; Ghana; Guinea; Guinea-Bissau; Kenya; Lesotho; Libya; Madagascar; Malawi; Mali; Mauritania; Mauritius; Morocco; Mozambique; Namibia; Niger; Nigeria; Rwanda; Senegal; Seychelles; Somalia; South Africa; Sudan; Eswatini; Tanzania; Togo; Tunisia; Uganda; Zambia; Zimbabwe

Diagram 2: Leading African Countries in terms of FP7 Research Funding
FP7 Research Funding - Top 20 African Beneficiary Countries
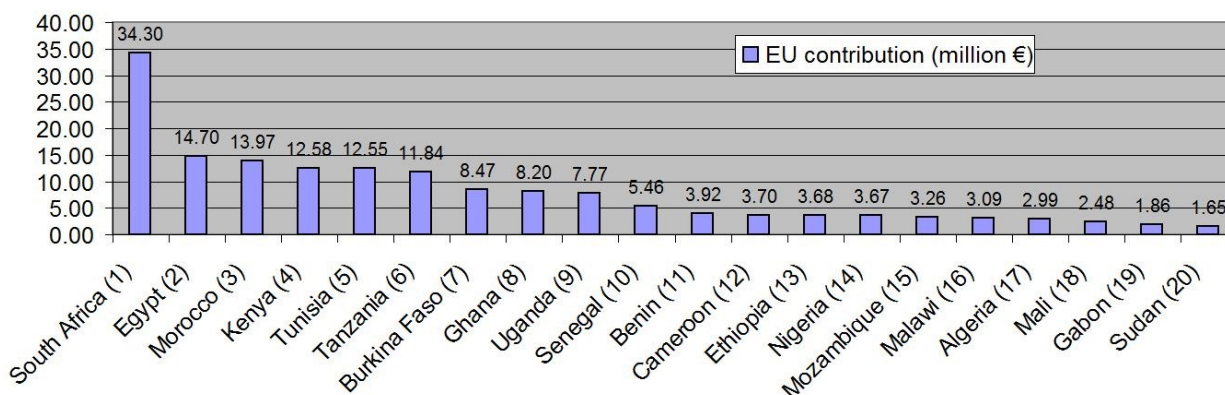
Source: S Hogan, EU Delegation to AU

The level of participation in FP7 by organisations in IST-Africa partner countries grew dramatically in recent years, as illustrated in Diagram 3 below. While this has brought much needed research funds into the beneficiary African institutions, it has also supported networking, capacity building and laid a solid foundation for future collaboration under Horizon 2020. Critically, it has supported a greater awareness of and openness to the benefits of international collaborative research.

Diagram 3: Participation in FP7 (IST-Africa Partner Countries)
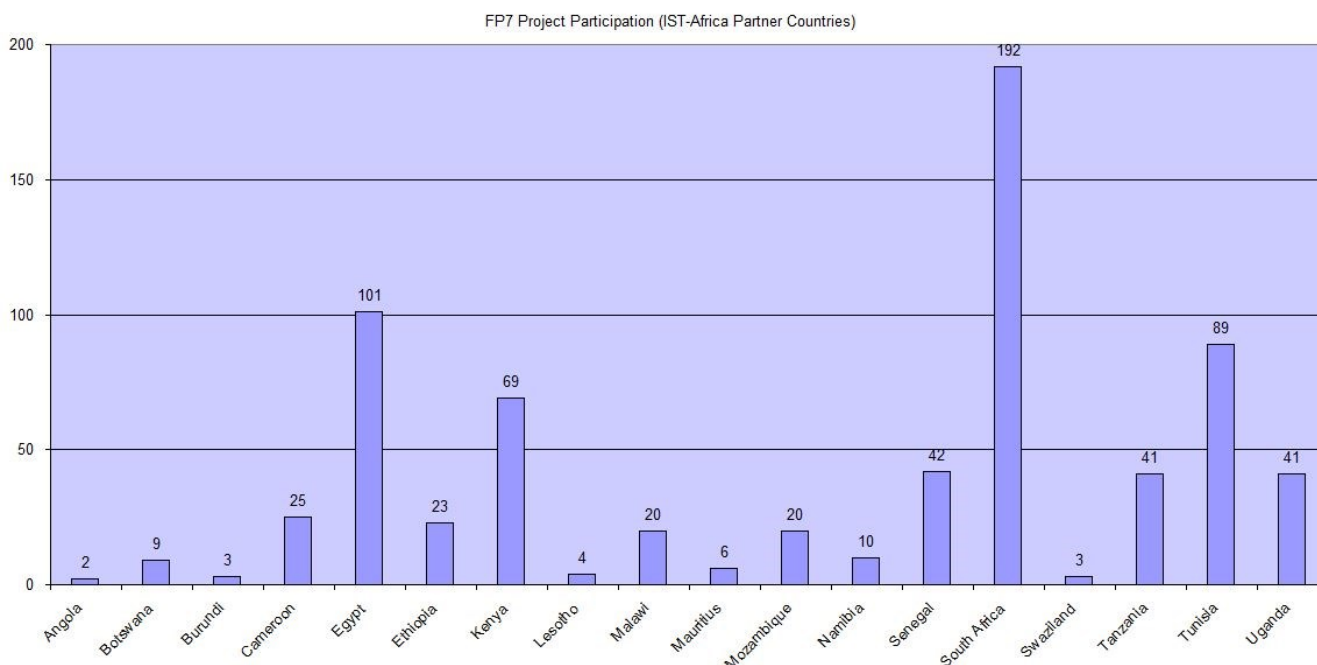
H2020 Research & Innovation funding of €91.9 million to date to 35 African Member States

IST-Africa is actively encouraging the participation of African institutions in both general and specific Calls under Horizon 2020 (2014 – 2020).

As at September 2018, there were over 625 participations from 364 organisations across 35[5] African Member States. Involvement in two hundred and seventy nine (279) Horizon 2020 projects, has resulted in over €91.9 million in research and innovation funding that would not exist in many African research centres and universities institutions. These projects are a mix of Research and Innovation Actions (104), Innovation Actions (25) and Coordination and Support Actions (50), Marie Curie RISE (68), Marie Curie ITN (8), Marie Curie IF (8), Marie Curie Cofund (4), ERC (4) and ERA-NET-Cofund (8). There is good participation across all three pillars of Horizon 2020. Diagram 4 below highlights the African countries with the highest number of Horizon 2020 funded projects as at September 2018 (IST-Africa analysis of data published on Cordis as at September 2018).

Diagram 4: Leading African Countries in terms of H2020 Projects (Sept 2018)

Horizon 2020 Projects - Top 20 African Beneficiary Countries
(data compiled by IST-Africa from Cordis data sets September 2018)
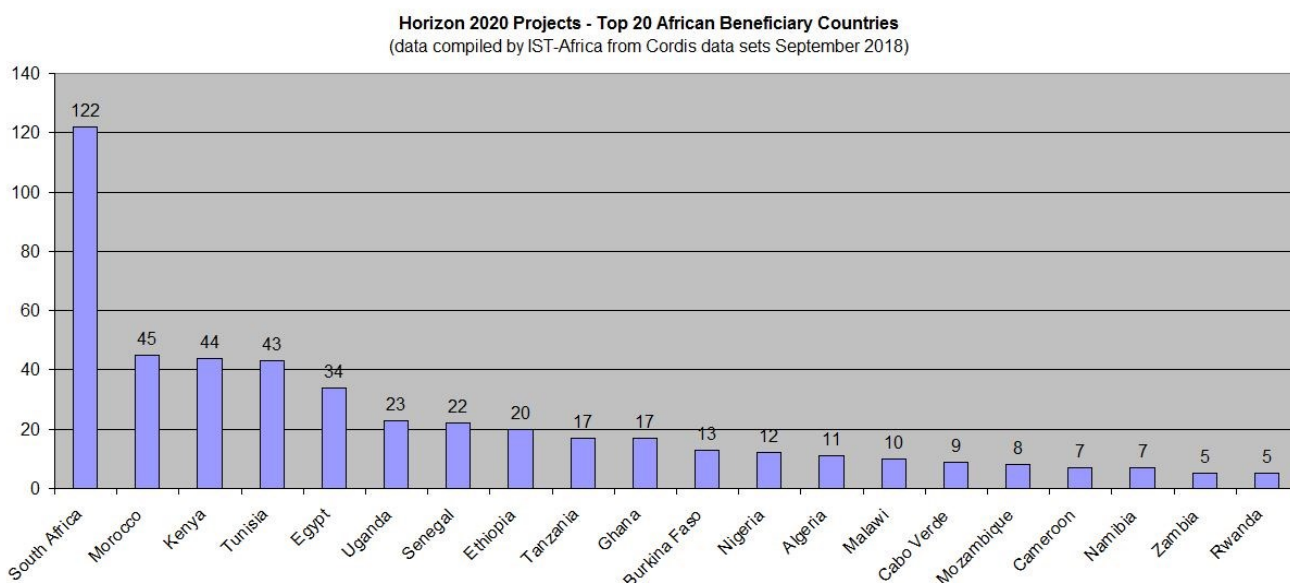
Diagram 5: Horizon 2020 participation by IST-Africa Partner Country (Sept 2018)

H2020 Projects in IST-Africa Partner Countries as at September 2018
(data compiled by IST-Africa from Cordis data sets September 2018)

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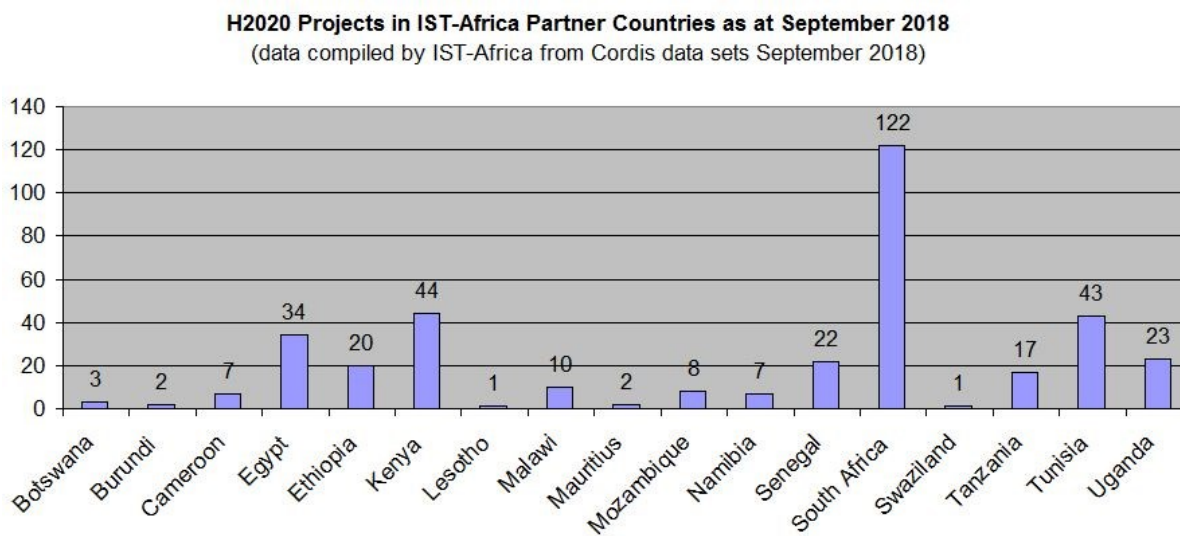
[5] Algeria; Angola; Benin; Botswana; Burkina Faso; Burundi; Cabo Verde; Cameroon; Democratic Republic of the Congo; Egypt; Ethiopia; Gabon; Gambia; Ghana; Kenya; Lesotho; Liberia; Libyan Arab Jamahiriya; Madagascar; Malawi; Mali; Mauritius; Morocco; Mozambique; Namibia; Nigeria; Rwanda; Senegal; South Africa; Swaziland; Tanzania; Togo; Tunisia; Uganda; Zambia

As at September 2018, over seventy six percent of all participating African organisations in funded Horizon 2020 projects as at September 2018 were from IST-Africa partner countries, securing competitive grant funding of over €69.9 million euro. Diagram 5 above outlines the participation in funded Horizon 2020 projects by each IST-Africa Partner Country as at September 2018.

ICT-39-2015 and ICT-39-2017 Calls

As part of its strategy to further grow African participation in internationally funded research, IST-Africa provided evidence to the European Commission to justify and secure €25 million for African-focused research cooperation under the LEIT Work Programme of Horizon 2020 - ICT-39-2015 Research and Innovation Actions (Horizon 2020 2014 - 2015 Work Programme) and ICT-39-2017 Innovation Actions (Horizon 2020 2016 - 2017 Work Programme).

IST-Africa actively disseminated the Call for Proposals for ICT-39-2015 and ICT-39-2017 to European and African institutions, organised dissemination and training workshops in Europe and Africa, assisted interested parties to identify relevant themes and partners and provided assistance in fine tuning proposals submitted for consideration for funding. Both Calls were very heavily oversubscribed with good quality proposals. This provides clear evidence of the interest of both African and European research institutions to cooperate to address Africa focused research and innovation challenges. Boxes 9 - 16 below provides insights in the results of the ICT-39-2015 Call and ICT-39-2017 Call.

Box 9: Horizon 2020 ICT-39-2015 Results

ICT-39-2015 ICT Call of Horizon 2020 was focused on initiating collaborative research and innovation projects addressing the needs of end-user communities in Africa in relevant thematic areas addressed by Horizon 2020 including Content Technologies and Societal Challenges. IST-Africa provided the evidence to justify this call.

IST-Africa actively promoted ICT-39-2015 in Africa and Europe, provided a mapping of research priorities and research capacity in IST-Africa Partner Countries and organised targeted Horizon 2020 Training Workshops in IST-Africa Partner Countries. Helpdesk support was provided to organisations preparing proposals, fine tuning ideas and looking for relevant partners to cooperate with.

The ICT-39-2015 Call was very successful with 45 proposals submitted including 194 participations from Africa out of 439 participations. The proposals submitted were considered to be of high quality and relevant to the focus of the call with 23 proposals over threshold.

Thematic areas addressed by these proposals included eHealth, eAgriculture, Internet of Things, Wireless communications, cloud computing, big data, eLearning, language technologies, green transport, clean energy, network technologies, smart cities and eInclusion.

African countries with highest number of participants in proposals included South Africa (36), Kenya (22), Tanzania (18), Uganda (15), Ghana (13), Senegal (13), Ethiopia (9), Cameroon (6), Mozambique (6), Nigeria (6), Namibia (5), Angola (4), Cape Verde (4), Morocco (4), Burkina Faso (3), Gambia (3), Guinea (3), Malawi (3), Mali (3), Niger (3); eight more African countries had either one or two participations.

Four projects were selected for funding with 11 African countries represented of which 6 IST-Africa Partner Countries are represented in all four projects - Ethiopia (3), Kenya (2), Cameroon (1), Malawi (1), South Africa (1) and Senegal (1).

> ## Box 9 cont: Horizon 2020 ICT-39-2015 Results
>
> - **DMC-MALVEC** – Development of integrated and automated multiplex vector-diagnostic platform for malaria, Led by IMBB-Forth (Greece) with African partners from Cameroon (Organisation de Coordination pour la lutte contre les Endémies en Afrique Centrale), Ethiopia (Jimma University), Zambia (Ministry of Health) and other European partners from Germany, Luxembourg, Italy, Switzerland and UK
>
> - **mHealth4Afrika** - Community-based ICT for Primary Healthcare in Africa, Led by IIMC (Ireland) with African partners from Ethiopia (University of Gondor), Kenya (Strathmore University), Malawi (Chancellor College), South Africa (Nelson Mandela University) and other European partners from Norway and Turkey.
>
> - **its4land** – Geospatial technology for land tenure security in East Africa, Led by Twente University (The Netherlands), with African partners from Ethiopia (Bahir Dar University), Kenya (The Technical University of Kenya) & Rwanda (Institut d'Enseignement Superieur de Ruhengeri and Esri Rwanda Ltd) and other European partners from Germany and Belgium
>
> - **WAZIUP** - IoT applications for Agriculture, Led by CREATE-Net (Italy) with African partners from Senegal (Uni of Gaston Bergeg de Saint Louis, CODER4Africa, CTIC Dakar), Burkina Faso (Polytechnic of Bobo-Dioulasso), Ghana (iSpace, Farmerline), Togo (L'Africaine D'Architecture) and other European partners from Germany, France and Portugal.

> ## Box 10: mHealth4Afrika
>
> mHealth4Afrika was funded as a Research and Innovation Action under ICT-39-2015. It runs from November 2015 - April 2019.
>
> mHealth4Afrika is focused on supporting Sustainable Development Goal 3 (Ensure healthy lives and promoting well being for all at all ages) by co-designing a modular, state-of-the-art health information system, designed to improve primary healthcare delivery in resource constrained environments.
>
> It aims to assist primary healthcare facilities to increase
> - Quality and impact of care through timely capture of information, systematic storage of important data points in the patient record and improved frequency of follow up
> - Frequency of contact with a focus on prevention through the use of state-of-the-art technologies at the point of care
> - Accuracy and quality of monthly aggregate program indicators
> - Access to educational materials for clinic staff and patients to improve skills
>
> The mHeath4Afrika system is being co-designed with Ministries of Health, district health officers, clinic managers and health workers in primary healthcare facilities in resource constrained urban, rural and deep rural environments in Southern Africa (Malawi, South Africa), East Africa (Kenya) and Horn of Africa (Ethiopia). It integrates Electronic Medical Records and Electronic Health Record functionality with medical sensors and data visualisation tools. It supports the adoption of technology at the point of care.
>
> mHealth4Afrika has made excellent progress in addressing the needs of both participating clinics and Ministries of Health. The current iteration of the platform is being piloted in Ethiopia, Kenya, Malawi and South Africa. It provides:
> - Clinic related functionality: Patient registration, Patient List, Clinic Appointment lists, Healthworker list, Program access rights
>
> - Patient related functionality: Patient Profile page; Programs included Medical History, Obstetric History, Maternal Program (Antenatal care (ANC), Delivery, Postnatal care), Child Under 5 (Growth & Nutrition, Childhood Illnesses, Immunisation, Vitamin A, Deworming), Tuberculosis, Antiretroviral therapy (ART), Family Planning, Cervical Cancer Screening and general Outpatient Department (OPD); Program reporting for individual patients.

Box 11: its4land - Geospatial technology innovations for land tenure security in East Africa

its4land was funded as a Research and Innovation Action under ICT-39-2015. It runs from February 2016 to February 2020. It aims to develop an innovative suite of land tenure recording tools inspired by geo-information technologies that responds to end-user needs and market opportunities in sub Saharan Africa, reinforcing an existing strategic collaboration between EU and East Africa.

its4land captured user requirements as inputs for the technical and institutional project work through site visits, workshops and empirical data collection in Ethiopia, Rwanda and Kenya. Analysis provided evidence of specific needs, market opportunities and readiness of end-users in the domain of land tenure information recording.

Achievements to date

The first version of the smart sketch maps ontology was based on data collection in Ethiopia, Rwanda and Kenya. Qualitative representation of sketch maps, documentation of extended LADM and a prototype for sketch map alignment has also been developed. The initial small unmanned aerial vehicles (UAVs) flights have been completed in Rwanda and Kenya to trial data acquisition methods. Tool development for automatic cadastral boundary extraction has been completed and mainly tested on data from Germany and Rwanda. Recently the work on developing an image-processing system for hosting the tools for boundary delineation on UAV orthomosaics and a qualitative data processing system for hosting sketch map tools has been accomplished. The Publish and Share platform provides a scalable runtime environment, a unified set of services for data management and interaction with tools mentioned above (sketch map, UAV and feature extraction). The development of a governance model has started to support the implementation and sustainable use of the innovative tools in order to meet stakeholders' needs. In parallel, a capacity development model is also being developed to strengthen the necessary skills and competencies so that the innovation process can have sustainable effects.

Box 12: Horizon 2020 ICT-39-2017 Interim Results

ICT-39-2017 ICT Call of Horizon 2020 was focused on initiating collaborative Innovation Actions addressing the needs of end-user communities in Africa in relevant thematic areas addressed by Horizon 2020 including Content Technologies and Societal Challenges. IST-Africa provided the evidence to justify this call.

IST-Africa actively promoted ICT-39-2017 across Africa and Europe and provided a comprehensive mapping of research priorities and research capacity in IST-Africa Partner Countries. IST-Africa organised a series of national training workshops during October - December 2016 in Namibia (26 October), Lesotho (31 October), Swaziland (02 November), Kenya (10 November), Tanzania (14 November), Botswana (17 November). Ethiopia (21 November), Malawi (28 November), Uganda (09 December), Cameroon (09 December) and Mauritius (14 December 2017). Helpdesk support was provided to African and European organisations preparing proposals, fine tuning ideas and looking for relevant partners.

The ICT-39-2017 Call was very successful with 71 Innovation Actions submitted with 659 participations. Participants represented 29 African countries including good levels of participation from IST-Africa Partner Countries: Botswana, Cameroon, Ethiopia, Kenya, Mauritius, Malawi, Mozambique, Namibia, Senegal, Swaziland, Tanzania, Uganda and South Africa. The proposals addressed a wide range of topics incorporating an ICT component across Horizon 2020 thematic areas. The most prevalent thematic areas addressed in the proposals submitted were eHealth and eLearning.

Thirty-three proposals were over threshold, with seven projects short-listed for funding based on the available funding envelope. The thematic areas addressed in the short-listed projects for funding include Cybersecurity, Internet of Things, eAgriculture and eLearning.

Box 12 cont: Horizon 2020 ICT-39-2017 Results

Six projects were selected for funding with 11 African countries represented, of which 5 IST-Africa Partner Countries are included: Ethiopia (1), Kenya (4), Tanzania (2), South Africa (1) and Uganda (2)

Go-GA (Nigeria, Kenya, Benin) - adaptation of Go-Lab Learning ecosystem (STEM)

EPICA (Kenya, Tanzania, Uganda) – ePortfolio, Skills

SAMS (Ethiopia) – Remote sensing technology to support beekeepers

FANFAR (Niger, Nigeria) – Flood forecasting and alerts in West Africa

WAZIHUB (Ghana, Kenya, South Africa, Tanzania, Uganda) – IoT Innovation Program

ISOOKO (Kenya, Uganda, Rwanda) - digital technologies to support peace education

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Box 13: GC-GA - Go-Lab Goes Africa

Go-GA was funded as an Innovation Action under ICT-39-2017. It runs from January 2018 to December 2020. It aims to adapt and pilot the Go-Lab ecosystem and Inquiry-based Learning Methodology for Science Technology Engineering and Mathematics (STEM) initially in Benin, Kenya and Nigeria. It is leveraging outputs from the FP7 GoLab and H2020 Next Lab projects. At a second stage it aims to extend the pilot to four associate countries - Ghana, Senegal, Sierra Leone and Tanzania.

Achievements to date
During the first year of the project, the Go-Lab ecosystem has been adapted and localized to the 3 pilot countries. 285 Nigerian, Benin & Kenyan teachers are now part of the Go-Lab learning community. 105 teachers were selected and trained as Master Teachers so they can train their peers as part of the upcoming Large-Scale Teacher On-Boarding programme. 6 Model Inquiry-Learning Spaces and 150 other standard ILS were created by teachers. 30+ schools are being enrolled to take part in the first GO-GA Pilot from February 2019. An Advisory Board of 10 key education stakeholders in the three pilot countries has been created and we have started drafting our Take Up & Scalability Strategy.

Year 2 will focus specifically on the implementation of the first pilot programme across Kenya, Benin and Nigeria, involving 20 teachers per country each implementing at least 1 ILS as part of their classroom lessons over a 3-week test period. Feedback and pilot data will be collected so that lessons can be learnt to feed into the second pilot starting in the fall of 2019.

Box 14: EPICA

EPICA was funded as an Innovation Action under ICT-39-2017. It runs from January 2018 to December 2020. It aims to adapt and pilot an ePortfolio, which will improve the quality, visibility and availability of new skills.

Achievements to date
During the first year of the project, EPICA has organised open days in: Maseno University, Kenya; Open University of Tanzania; and Makerere University, Uganda to engage with local stakeholders. The ePortfolio Maturity and needs report has been finalised describing the needs and the maturity level in the implementation of the ePortfolio ecosystem. The pedagogical and users' requirements have been collected through the EPICA pilots. Legal and Business requirements have also being collected. Analysis of the Pedagogical, Users', Legal and business requirement is underway and is supporting the definition of technical requirements. The Development of a Roadmap for technological development and the design of the ePortfolio user interface are being developed in accordance to the previous requirements' analysis and both are nearing finalization.

Box 15: Smart Apiculture Management Services (SAMS)

SAMS was funded as an Innovation Action under ICT-39-2017. It runs from January 2018 to December 2020. It aims to develop and refine an open source remote sensing technology and user interaction interface to support small-hold beekeepers in managing and monitoring the health and productivity in their own bee colonies.

Achievements to date

Based on the User Centered Design the core activities of SAMS include the development of marketable SAMS Business Services, the adaption of a hive monitoring system for local needs and usability as well as the adaption of a Decision Support System (DSS) based on an open source system. As a key factor of success SAMS uses a multi stakeholder approach on an international and national level to foster the involvement and active participation of beekeepers and all relevant stakeholders along the whole value chain of bees.

During the first year of the project, UCD Workshops, Advisory Board meetings and the preparation of various deliverables on the topics "UCD-Needs Assessment and Evaluation, Manual on Beehive Construction and Operation, Bee-Management and Bee-Health Indicators" were carried out.

Box 16: ISOOKO

ISOOKO was funded as an Innovation Action under ICT-39-2017. It runs from January 2018 to December 2020. It aims to support peace education through digital technologies. ISOOKO project has three interrelated strands: ISOOKO as a Repository: How can (currently available or potential) digital technologies support and/or complement peace education?
ISOOKO as a Platform: How can we develop and trial a platform to support peace education, focusing on programmes and activities in Rwanda and Kenya
ISOOKO as a Process: How can we devise a methodology for developing and trialling such digital technologies more broadly?

Achievements to date

During the first year of the project, the baseline survey of digital technologies used in peace education in Rwanda has been undertaken. The participatory development methodology for ISOOKO has been draft. Two weeks of in-country knowledge exchange workshops have been held in Rwanda, with schools and youth organisations. The initial wireframes for the ISOOKO platform have been developed. The ISOOKO project evaluation methodology has been drafted. The planning for the next round of in-country workshops in Rwanda and Kenya has been undertaken.

European Development Funds - EDF11 NIP encouraging exploiting ICT

The **European Development Fund** (EDF) supports the implementation of the European Union's (EU's) Cotonou Partnership Agreement and is the main instrument for providing support to African, Caribbean and Pacific (ACP) countries. It also provides funding for the EU's Overseas Countries and Territories. The EDF has a strong poverty focus and 85% of funds go to Low Income Countries. Since 2000, the Cotonou Agreement has governed relations between the 78 ACP countries and the 28 EU Member States. The EDF began in 1959 and is now in its 11th cycle (2014-2020).

It is positive that the National Indicative Programmes for EDF11 incorporate "***exploiting the potential of Information and Communication Technologies***" as one of the cross-cutting factors to be considered in the focal sectors, when designing sector interventions. It is clear that ICT should

be an important horizontal enabler in Education, Health, Rural Development, Agriculture, Water and Transport. Africa is demonstrating leadership in innovative exploitation of mobile technologies and applications - it would be positive if this expertise is leveraged when developing sectoral applications.

AfricaConnect   AfricaConnect and AfricaConnect 2 have been funded as regional infrastructure networks projects under EDF10 and EDF11. AfricaConnect 3 is currently under preparation to commence mid 2019.

Box 17: Africa Connect (EDF10)

Africa Connect was co-funded from 2011 - 2015 under European Development Funds 10 (EDF10), with a budget of €14.5 million based on 80% funding through DG DEVCO and 20% of funds provided by African partners on a cost-sharing model. AfricaConnect 2 was co-funded under EDF11 from late 2015 to 2019, with a budget of €26.6 million based on 80% cofunded by DG DEVCO.

The AfricaConnect projects, both the first one as the second (AfricaConnect2), have been set up with the intention to establish high-capacity internet networks for research and education in the African continent and to strengthen the link with Europe to allow for global collaborations. Through these projects, the project also aims to support the fulfilment of the region's MDGs (Millennium Development Goals) and SDGs (Sustainable Development Goals), open up research activities in the region and build co-operation with the rest of the world, reduce poverty, brain drain and the digital divide, all through the creation and use of National Research and Education Networks (NRENs).

The first project, has established a high-capacity Internet network for research and education in Southern and Eastern Africa providing the region with a gateway to global research collaboration. AfricaConnect, which lasted four years, began in May 2011, and consisted of two phases, the first of which was for the planning and procurement of the network, and the second its operation.

Achievements include:

April 2012: international link seamlessly connecting African radio astronomers to Europe through the UbuntuNet network and GÉANT

July 2012: Zambian and South African researchers to connect through the first UbuntuNet cross-border link

November 2012: official launch of the UbuntuNet network

June 2013: NRENs and members in Sub-saharan Africa to receive training from Oregon based NSRC (Network Startup Resource Center) to narrow the global digital divide

July 2014: UbuntuNet being commissioned in Southern and Eastern Africa with Points of Presence (PoPs) in Mtunzini, Maputo, Dar es salaam, Nairobi, Kampala and Kigali connecting to UbuntuNet Alliance's PoP in London, as well as a transcontinental link between Nairobi and UbuntuNet Alliance's PoP in Amsterdam. Serving the following 6 NRENs: TENET (South Africa), MoRENet (Mozambique), TERNET (Tanzania), KENET (Kenya), RENU (Uganda) and RwEdNet (Rwanda). This also formed the backbone on which the network serves the entire UbuntuNet alliance region with.

October 2014: Joining forces with the medical community to combat tropical diseases: colleagues around the world led a helping hand to formulate the programme for a special Ebola Symposium at the UbuntuNet Alliance annual conference

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Box 18: AfricaConnect 2 (EDF11)

AfricaConnect 2

After the success of AfricaConnect, a second project continued the aim to support the development, consolidation and use of high-capacity NRENs across Africa. AfricaConnect2 extends the scope of its predecessor to a pan-African level by connecting North, Western and Central Africa and supporting these regions through a modular approach adjusted to specificities of the African sub-regions. The project comprises three geographical areas and involved their respective regional networking organisations: ASREN in North Africa, WACREN in West and Central Africa, UbuntuNet Alliance in Eastern and Southern Africa.

AfricaConnect 2 Achievements include:

February 2016: Lebanon joining the global research and education networking community with a link from the American University of Beirut (AUB) to the ASREN PoP in London

March 2016: Ugandan NREN RENU providing high capacity and affordable internet connectivity for Ugandan, South African and Norwegian universities to collaborate to build capacity in the Ugandan media sector by strengthening research and training

April 2016: major boost for EU-Algerian science collaboration since the connectivity upgrade from 622 Mbps to 2.5 Gbps by ASREN and GÉANT

October 2016: GÉANT, the UbuntuNet Alliance, and Indiana University co-lead $3.25M grant to improve research collaborations between Europe, Africa, and the US. Improved intercontinental networks will support critical research in foodsecurity, environment preservation, and HIV treatment

June 2016: high-speed internet access enables researchers in Zambia to rapidly acquire large data sets and gain an accurate understanding of physical, chemical and biological soil processes and their roles in delivering ecosystem services; in addition, faster analysis results allow them to *monitor soil degradation and provide input to sustainable land management policies*

October 2016: NORDUNET's Knowledge Exchange Fellowship programme including participants from Ghana, Lebanon and Zambia to exchange experience and knowledge with Nordic R&E networks, and other emerging networks around the world, shows the importance of physical and human connections in the R&E community

January 2017: SomaliREN using the NREN to address brain drain

November 2017: from optimising administrative processes on campus to job creation: a story of the students from Kyambogo University in Uganda benefitting from the NREN

February 2018: Kenya Finland partnership boosting access to geoinformatics education and training to aid sustainable development. Kenyan NREN KENET upgraded internet speeds for the university which allowed support of the partnership by the existence of an increased bandwidth of up to 1 GB

February 2018: Women in WACREN event, inviting trainers from the global R&E community, to empower women in Science, Technology, Engineering and Mathematics (STEM). The February workshop evolved around learning Python, as the main focus of the software development workshop

March 2018: official launch of WACREN network with a link from Lagos to London, where it interconnects with the GÉANT network and from there to over 100 countries worldwide with an additional link from Lagos to Accra

May 2018: AfricaConnect2 and Egyptian NREN ENSTINET enable scientists at the National Authority for Remote Sensing and Space Sciences (NARSS) to monitor and predict sandstorms, assisting Egyptian authorities in issuing timely alerts to asthma sufferers

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Box 18 cont: AfricaConnect 2 (EDF11)

May 2018: Tanzanian NREN TERNET supplying 10 Mbps of fast, dedicated and reliable bandwidth to member university Aga Khan University providing support to the university's IT infrastructure, allowing teachers and students to virtually traverse across universities through applications such as Zoom, Skype and Moodle

June 2018: Morocco to re-connect international R&E community through AfricaConnect2

July 2018: Somalia connected to the UbuntuNet network

July 2018: WACREN joining the global R&E networking infrastructure by signing the Open and Interconnection Agreements with GÉANT

September 2018: ASREN and GÉANT signed an interconnection agreement to upgrade the existing link of ASREN to the GÉANT network at a capacity of 10 Gbps through the London Open Exchange

October 2018: internships showing the transformational effects NRENs can have as an enabler of learning and knowledge in emerging economies in Nigeria

November 2018: Tunisia to re-connect international R&E community through AfricaConnect2

Ongoing Work

AfricaConnect2 is currently focusing on getting countries connected, especially in the WACREN region where a link has been officially launched since March 2018 from Lagos to London. NRENs in Western and Central Africa can, just as has shown in the UbuntuNet region, benefit from this backbone to get their members connected regionally as well as to the global R&E community. A great effort being committed to support the NRENs and regional RENs with communications and visibility, ranging from having created an 'Africa Comms' channel on Slack to continuously engaging digitally with the community. Preparations are in place towards an AfricaConnect3 project starting in the second half of 2019.

Digital4Development   While the importance of appropriately leveraging ICT has been recognised in the Millennium Development Goals (MDGs), Sustainable Development Goals (SDGs) and in the National Indicative Programme for EDF 11, it is reinforced again as a valuable horizontal enabler in the Sustainable Development Goals (SDGs)[6]. SDG9 focuses on building resilient infrastructure, promoting inclusive and sustainable industrialisation and fostering innovation. The appropriate use of ICT is also highlighted within SDG3 Health, SDG4 Education, SDG5 Gender Equality, SDG6 Water and Sanitation, SGD7 Energy, SDG11 Sustainable Cities and Communities and SDG13 Climate Change. In the context of EDF10 and EDF 11 a lot of investment has been put into infrastructure and digitisation is being actively encouraged. In this context the European Commission developed the Digital4Development[7] framework to "*mainstream digital technologies across four main priority areas:*

i) promote access to affordable and secure broadband connectivity and to digital infrastructure, including the necessary regulatory reforms;

ii) promote digital literacy and skills;

iii) foster digital entrepreneurship and job creation; and

iv) promote the use of digital technologies as an enabler for sustainable development."

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[6] https://www.un.org/sustainabledevelopment/sustainable-development-goals/
[7] https://ec.europa.eu/europeaid/sites/devco/files/swd-digital4development_part1_v3.pdf

The Commission Staff Working Document "*Digital4Development: mainstreaming digital technologies and services into EU Development Policy*" SWD(2017) 157 final was published in May 2017. It was presented during IST-Africa 2017 in Namibia.

It aims to provide a framework to "*promote information and communication technologies in developing countries as powerful enablers of growth, and to better mainstream digital solutions in development*".

In a developing country context, barriers that are highlighted in the context of the four priority areas include: cost of broadband access, digital literacy skills, local content, regulatory barriers, low public sector support for local products and services, need for entrepreneurial skills, need to develop and implement cybersecurity policies and encourage open access to relevant data sets.

In the context of priority area four "Digital technologies as an enabler", seven areas have been identified: Digital 4 Gender Equality; Digital 4 Climate Change, Environment and Sustainable Energy; Digital 4 Secure Identity for all; Digital 4 Capacity Building; Digital 4 Sustainable Agriculture; Digital 4 Education and Human Development and Digital 4 Health.

While Digital4Development provides a framework, it does not have a dedicated budget or funding instrument. It is envisaged that projects and initiatives launched will leverage existing funding mechanisms such as European Development Funds (National and/or Regional Indicative Programmes), Horizon 2020, Erasmus+, Development Cooperation Instrument. It is important that there is ongoing engagement with EU Member States, partner countries, academia, civil society and digital private sector to ensure successful implementation.

To kick-start this framework a number of actions were identified to commence during 2017 / 2018 using existing funding mechanisms (Annex 1 of Working Document).

Box 19: Digital 4 Development - Short term actions

Commission Staff Working Document "Digital4Development: mainstreaming digital technologies and services into EU Development Policy" SWD(2017) 157 final identified five projects focused on Africa to commence during 2017/2018 using existing funding mechanisms:

Multinational Trans-Saharan Backbone (TSB) Optical Fiber Project (TSB) - Niger and Chad, EU Contribution: €29 million, Funding Instruments: AfIF, PANAF/DCI (BUDGET), funds Blending / Lead financier: AfDB

Central Africa Backbone (CAB) Project – Central African Republic (CAR) Component, Cameroon, DRC and CAR, EU Contribution: €17.5 million, Funding Instruments: RIP Central Africa (EDF) through AfIF, Blending / Lead Financier: AfDB

Cyber Resilience for Development - Cyber4D, initially focused on Botswana and Mauritius, EU Contribution: €11 million, Funding instrument: Instrument contributing to Stability and Peace (IcSP) (BUDGET)

Policy and Regulation Initiative for Digital Africa (PRIDA), EU Contribution: €7.5 million, Funding instrument: PANAF/DCI (BUDGET)

"Digital4Inclusion": Support to financial inclusion in ACP countries through the promotion of inclusive and responsible Digital Finance Services (DFS). ACP Countries, EU Contribution: €25 million, Funding Instrument: 11th EDF (Intra-ACP)

Box 20: *Digital 4 Development - Central Africa Backbone (CAB) Project – Central African Republic (CAR) Component*

The project aims to reinstall terrestrial optical fibre links that interconnect the countries of Central Africa region providing broadband access from landing points of submarine cables. In the longer term it aims to contribute to the diversification of the Central African economy through fibre-optic access infrastructure to Cameroon and Congo, providing digital access to rural areas, increasing tax revenue and reducing the cost of economic and social transactions and creation of employment opportunities for young people. This project is funded by the African Development Bank with a contribution from EU through EDF Regional Indicative Program for Central Africa of €17.5 million.

The project has four components, which encompass ICT infrastructure, Applications and ICT Services, Institutional support and capacity building and project management.

Component 1 (ICT infrastructure, €21.83 million) focuses on installation of 1,000 km of fibre optic from Bangui-Berberati-Gamboula (towards Kentzou border with Cameroon) and Bangui-Berberati-Lidjombo (towards Bomassa, border with Congo). A 50km urban local loop is also planned in Bangui to connect the national data centre to remote administrative sites. Twenty digital Community centres will be established.

Component 2 (Applications and ICT Services, €3.5 million) focuses on establishing a national data centre to support eGovernment and the installation of an eAdministration platform.

Component 3 (Institutional support and capacity building, €4.5 million) aims to implement a Public-private partnership for management of the fibre optic backbone and technical assistance to the regulatory authority (ARCEP) to regulate the wholesale market. Support will be provided to education institutions, operationalisation of a national ICT authority, technical support to the Ministry of Postal and Telecommunications in charge of ICT and capacity building of environmental protection agencies (DGE, WWF).

Box 21: *Digital 4 Development - Cyber Resilience for Development - Cyber4D*

The project aims to increase the cyber resilience of third countries while promoting an inclusive multi-stakeholder and rights-based approach and ensuring compliance with the rule of law and good governance principles e. This project is funded as multi donor action with an EU contribution through Instrument contributing to Stability and Peace (IcSP) of €11 million. It has a 42 months duration.

The project has three components:
(1) Strengthened Cybersecurity Policy, Strategical, and Coordination Frameworks and
(2) Increased Cybersecurity Incident Response Capabilities.

The first two have a country-specific focus in up to 7 priority countries in Africa and Asia. The initial priority countries in Africa are Mauritius and Botswana.

(3) Fostered Networks of Cyber Expertise and Cooperation - focus on bringing different countries, regional and technical organisations together to share cybersecurity good practices globally on the basis of EU expertise and promote the creation of formal and informal networks in order to increase trust and cooperation at regional, trans-regional and international level.

The inception phase ran from December 2017 to August 2018, with the implementation phase commencing in September 2018.

Following approval of the inception report, sensitisation and assessment visits were undertaken to Mauritius, Botswana and Sri Lanka. There has been engagement with public and private sector stakeholders including representatives of critical national infrastructure bodies Training has been provided to expert staff in National Computer Emergency Response Teams, which has assisted in preparing detailed needs assessment documentation. A project coordinator has been appointed in each country. They are responsible for supporting the development of detailed action plans to deliver National Cyber Security Strategies. They are also planning project launch events due in early 2019.

Box 22: Digital 4 Development - Policy and Regulation Initiative for Digital Africa (PRIDA)

The project aims to foster universally accessible and affordable broadband across the African continent (to unlock future benefits of internet based services). This project is funded through PANAF/DCI (BUDGET) with a contribution from EU of €7.5 million. It commenced in September 2017, with a 60 month duration.

Three outputs are envisaged:

Output 1: Predictable spectrum allocation, licensing, management including the treatment of harmful interferences and pricing based on international best practices with a forward looking approach towards the Internet of Things (IoT) is improved. This includes: analysis of current legislative and regulatory framework, usage of spectrum, fibre deployment for backhaul services; development of guidelines and case studies on national spectrum allocation, licensing and pricing; development of harmonised roadmaps for adaptation of current legislative and regulatory framework; development of harmonised spectrum reframing methods; development of guidelines and case studies for IoT, technical assistance and capacity building. An agreement was signed with ITU related to output 1 in November 2018 for 42 months.

Outputs 2: a) Development of Continental ICT/ Telecommunications Legislative and Regulatory Monitoring & Evaluation methodology; b) Strengthen Continental cooperation between national telecommunications regulatory authorities (NRAs); c) Raise awareness of cross cutting use of ICTs (policy) by public authorities and civil society

Outputs 3: Improve Capacity of African stakeholders active in the global internet governance

Outputs 2 and 3 are managed by AUC (Department of Infrastructure and Energy) with the support of a Technical assistance for which a service contract was signed with the consortium GFA-CARSA-Research ICT Africa on 20/10/2018, for a duration of 3 years. The Budget of the AUC is also supported through the African Union Support programme (AUSP). The programme formally started with a first Global Steering Committee organised on 10 December 2018.

Box 23: Digital 4 Development - Digital4Inclusion (ACP)

The project aims to deepen financial inclusion in ACP countries by promoting inclusive and responsible Digital Financial Services (DFS) ecosystems that can benefit poor people and entrepreneurs. It aims to do this by developing responsible, open and inclusive digital financial ecosystems based on knowledge and innovation in ACP countries and further develop and scale up innovative digital financial solutions based on multi-stakeholder alliances.

This project is funded through 11th EDF (Intra-ACP) with a contribution from EU of €25 million.

DG DEVCO has consulted with the ACP Secretariat on behalf of the ACP Group of States in relation to the guidelines for the Calls for proposals. DG DEVCO and the ACP Secretariat aim to finalise the financing agreement to facilitate Calls for proposals to be launched during January 2019. DG DEVCO plans to hold an Information Day in Brussels during February 2019. It is expected that projects approved under the Call will commence in the last quarter of 2019.

Annex 2 of the Working Document outlines domains under which medium term actions could be undertaken. Initial preparatory work has been undertaken in the eGovernance, Energy, Health, Agriculture and Education domains during 2018. This work will support consultations with DG Delegations to raise awareness of potential digital programme components to be included in future initiatives.

Box 24: Digital 4 Development - Status on Medium Term Measures (2018 - 2020)

The preparatory work has been undertaken in the eGovernance, Energy, Health, Agriculture and Education domains during 2018 for Medium Term Measures (Annex 2, SWD(2017) 157 final)

eGovernance domain - A study has been undertaken entitled "The deployment of e-governance systems in Africa" during 2018. It provides a mapping of African countries' readiness to implement eGovernance and eGovernment systems. It also provides the elements to allow for informed dialogue between EU Delegations and African partners and eventually to support pilot projects and/or national/regional initiatives for deployment of eGovernance solutions, including actions for identity/eSignature.

Energy domain - A preparatory study is on-going on the energy-digital nexus which focuses on financially sustainable business models of energy micro- and mini-grid investments that focus on delivering sustainable energy, digital and other services. Exploratory work is ongoing to identify digital –energy projects that involve private partners.

Health domain - Mapping of projects with e-/m-health components in the partner countries is ongoing with the aim to integrate digital components in the health programmes. Aim to start consultations with EU Delegations to raise awareness and sensitise the delegations towards opportunities to consider and promote the inclusion of digital programme components.

Agriculture domain - DEVCO is carrying out a short study, comprising a mapping of EU-funded projects in e-agriculture, a gap analysis of what type of projects could be funded and a discussion on future plans for post 2020.

Education domain - A study providing the mapping of types of projects/programmes supported by the EU in partner countries in the area of education & digital has been completed. Next step will be to deliver guidelines to the EU delegations on how to further increase the integration of digital components in digital education strategies in partner countries.

EDF10 projects with ICT components identified in Cameroon, Ethiopia, Lesotho, Malawi, Mauritius, Namibia, Tanzania, Senegal, Eswatini and South Africa (MPI).

IST-Africa partners requested information from their National Authorising Authority (NAA) in relation to projects funded under EDF10 and MIP that incorporated an ICT component. To date Cameroon, Ethiopia, Lesotho, Malawi, Mauritius, Namibia, Tanzania, Senegal and Eswatini have identified projects funded under EDF10 and EDF 11 with ICT components (Tables 1 - 7, 9). According to the National Authorising Authority €6.5 million has been allocated to ICT-related activities across EDF10 in Eswatini. ICT and Innovation related projects have also been identified through European aid in South Africa (Table 8).

Table 10 below provides an overview of EDF10 and EDF11 in terms of funding level and focal areas agreed for each programme.

Table 1: ICT-related Components within EDF10 Projects Funded in Cameroon

No	Program	Project/Activity	Amount (Euros)	Status	Remark
1	Public Finance Reform Support Program	Development of an integrated system of human resource management and payroll of government employees (SIGIPES II)	2,728,300	Ongoing	Overall cost of the project: 4 095 000 euros, Cameroonian Government covers the rest
2		Elaboration of a set of specifications for the purchase of a software package of an integrated tax management system	106,444.80	Ended	Reception date: January 2014
3	Customs Modernisation Support Program	Acquisition of ICT related equipments in Custom Offices Nationwide	303,562.62	Ended	Reception date: June to July 2013
4		Acquisition of Electronic Luggage Scanner at Douala International Airport	539,905.02	Ended	Reception date: September 2013
5		Acquisition of Solar Energy Plates in some Custom Offices Nationwide	344,767.50	Ended	Reception date: May 2014
6	Electoral Process Support Project in Cameroon	Acquisition of ICT related equipments	48,058.81	Ended	Reception date: February to May 2012

Table 2: Projects with ICT components planned under EDF 11 in Cameroon

ICT components are planned to be leveraged in a number of regional projects under EDF11 as outlined below.

No.	Project Description	Total Cost Envelope	Notes
1	Provide an evolving knowledge base for ICT in the region with an understanding of the economic, social, environmental and legal issues of digital society in an overall ICT perspective in the Central African region for 5 to 10 years	€2 million	EDF11 projects are coordinated at regional level (Cameroon, Gabon, Congo, Equatorial Guinea, Chad and

2	Provide decision support to governments, regulators, investors and users by identifying technical, economic and organizational solutions appropriate to the characteristics of the region and its various components, geographical and economic areas, including access to populations less favoured and distant		Central Africa Republic). The projects are still at initiation state, the cost of each project will be determined based on its need.
3	Evolving action Plan of technical, economic and organizational ICT needs and solutions for the region and its various components		
4	Regional telecommunications strategic plan with costing of investment needs and needs assessment for universal service support funds		
5	Regional telecommunications strategic plan with costing of investment needs and needs assessment for universal service support funds		
6	Proposal of concrete plans for the implementation of the strategic plan in the countries		
7	Regional Interuniversity Network in ICT providing training and scientific advice to the authorities		

Table 3: ICT-related Projects Funded under EDF10 & EDF 11 in Ethiopia

No	Program	Project Activity	ICT Budget Euro	Notes
1.	Agricultural Marketing	Acquisition of ICT equipment and establishment of market information system for Ethiopian Commodity Exchange (ECX)	€4 million	EDF10 project - total funding €10 million, Closing
2.	Trade Enhancement Facilitation Project	Market Networking by Ministry of Trade	€5 million	EDF 10 project, Ongoing
3.	National Quality Infrastructure (Ministry of Science and Technology)	• Quality and Standards Development including ICT • Research Support	€6 million	EDF10 Project. finished
4.	Transformation Triggering Facility (TTF)	4.1 Business school • Online courses (eLearning)· • Offline course delivering 4.1.1 Business innovation center • Development of ICT infrastructure 4.2. One stop shopping system for SME and investment owned by Ministry of Industry	€35 million	EDF11 Activity - ongoing

Table 4: Projects Funded under EDF10 in Lesotho with ICT Components

Maseru Waste Water Project (€24.3 million): to rehabilitate and expand the sewage system in Maseru
Three Towns Water Supply and Sanitation project: to upgrade potable water supplies to the towns of Roma, Teyateyaneng and Maputsoe.
Turnkey Supply of an Integrated Financial Management Information System (IFMIS) (€7,299,701): contributes to the Government of Lesotho's effort to improve governance and accountability by improving Public Financial Management.

Table 5: ICT-related Projects Funded under EDF10 in Malawi within Economics and Good Governance Sector

Programme/Project	Description	Total Project amount (euro)	Budget for ICT component
Trade Statistics and Information System under Capacity Building Towards Trade and Private Sector Development	The objective is to enhance capacity of responsible government departments to generate, process, package and monitor trade related information and statistics for policy making; and improve capacity of key agencies to provide timely, up to date trade intelligence for the private sector. Consists of several components one of which is the development of Improved Trade Statistics and Information System to be used by Malawi Revenue Authority (MRA), Ministry of Trade, National Statistical Office (NSO) and Malawi Investment Trade Center (MITC)	€3,000,000	€1,300,000
Democratic Governance Project - Ministry of Justice	The objective is to target the legal and judicial systems in Malawi with the aim of strengthening the democratic process and good governance, improve accountability and provide information and access to justice. One of the components is the development of an Integrated Case Management System for the Judiciary and Directorate of Public Prosecutions. The Case Management System is undergoing provisional acceptance procedures.	€32,500,000	€1,585,000

Table 6: ICT-related Projects Funded under EDF10 in Mauritius

Project Name	Focus	Budget
Consultancy for 'Ensuring the compliance of the data protection legislation and principles of Mauritius with EU standards'	The global objective of this assignment is to amend the Data Protection Act in the perspective of achieving compliance with the EU data protection laws, and to improve the existing institutional set-up of the Data Protection Office to meet international standards.	€30,000
Capacity Building Programme on Green IT and Energy and Energy Efficient Data Centres	NCB organised three training sessions during the period May-June 2013: (a) Green IT (b) EU Code of Conduct for Data Centres and (c) Energy and Cost Management in Data Centres, all leading to industry certification from BCS, the Chartered Institute for IT. The objective of this Capacity building programme is to raise awareness on the opportunities for energy and cost efficiency within the industry and gives guidance on initiatives and changes that can be made to improve the efficiency of	Rs. 3.2 m (€83,756)

	the data centre infrastructure, as well as the IT equipment.	
Consultancy Services on Sustainable Buildings and Construction for Mauritius	The Ministry of Environment and Sustainable Development (MOESD), in collaboration with the United Nations Environment Programme (UNEP), developed a National Programme on Sustainable Consumption and Production (SCP) for Mauritius for the period 2008 - 2013. One of the key priority areas identified in the SCP programme is Sustainable Buildings and Construction. In this context, the government requested for Consultancy Services to develop a policy on Sustainable Buildings and Construction, including guidelines on sustainable buildings. The global objective of this assignment was to establish a comprehensive framework to promote sustainable buildings in the Republic of Mauritius (island of Mauritius and Rodrigues).	€171,000
Consultancy Services on the development of national policy, strategy and action plan for the management of electrical and electronic equipment wastes (e-wastes)	This project is currently in progress where three experts funded by the European Union is developing the E-Waste Policy, Strategy and Action Plan for Mauritius. The specific objectives of this project are: a) Assess and evaluate existing e-waste policy, initiatives, gaps, challenges and opportunities in/for the management of e-wastes in Mauritius. b) Develop comprehensive national e-waste policy, strategies and an action plan for the environmentally sound management (ESM) of e-wastes in Mauritius. c) Recommend appropriate economic and policy instruments and financing mechanism which will favour the ESM management of e-wastes in Mauritius d) Recommend appropriate legal, institutional and administrative framework for the ESM of e-wastes in Mauritius.	€177,000
National Open Source Policy, Strategy and Action Plan	A National Open Source Policy Strategy and Action Plan has been developed with the assistance of two consultants from Astec Global Consulting Ltd. The main objective of this project was to develop strategies and plans for reinforcing the use of Open Source Software to enhance value and improve efficiency within the Mauritian public and, indirectly, private ICT sector, SMEs and boosts local capacity to help develop local knowledge communities. Four Strategic Pillars associated with specific goals and targets have been identified as necessary for the growth of an OSS ecosystem namely: a) OSS enabled education system on all levels b) OSS based research activities on universities and tertiary education c) Common place for all Open Source Software, Open Standard, Open Content and Open Data activities d) Common collaboration platform and technology platform	Rs2.4 million (€63,224)
ENERGIC Platform	The objective of the ENERGIC platform is to contribute to sharing of information, networking and capacity building of players of the IOC Member States working in the energy sector. It provides resources on renewable energy and energy efficient including reports, videos and	€5,600 from May 2017 to Nov 2019

	articles on the sector. It has been set up in the context of the 10th EDF regional renewable energy and energy efficiency programme.

Table 7: ICT-related Projects Funded under EDF10 in Namibia

Programme Name	Project Name
Focal Sector	
Human Resources Development (ETSIP, €42.5 million)	**Information, Adult and Lifelong Learning** 1. Improving and strengthening equitable access to information and Learning resources, 2. Strengthening the quality and effectiveness of knowledge management systems, 3. Setup public ICT access points through national libraries and CLDC networks
	ICT in education: 4. Development and deployment of ICT services and support, 5. Strengthening education managementthrough the use of ICT, 6. Review and development curriculum and content in ICT for VETs and schools, etc., 7. Review, development and implement of training in ICT. 8. Setup computers labs in colleges and VETs, 9. ICT in secondary and primary schools
Non-Focal Sector	
Governance (**€9 million**)	Support to the Performance management system, Office of the Prime Minister

Table 8: ICT-related Components within EDF10 Projects Funded in Senegal

Project Title	Sector	Total Budget	% of budget for ICT components	Budget for ICT Components	Timeframe
Projet d'appui à la modernisation de l'état civil	Government and Civil Society	€5 million	40%	€2 million	2012-2017
Bases de données urbaines	Construction	€900,000	25%	€225,000	2010-2014
Projet d'appui à la réforme du foncier urbain	Construction	€7 million	25%	€1.75 million	2011-2012
Appui de l'Union européenne à l'Assemblée Nationale au Sénégal	Government and Civil Society	€800,000	15%	€120,000	2013-2015
Projet Fichier Unifié des Données du personnel de l'Etat (FUDPE)	Government and Civil Society	€659,469	70%	€461,628	2012-2014
Projet de gestion intégrée des zones côtières (GIZC)	Environmental Protection	€4 million	15%	€600,000	2010-2015
Appui aux marchés publics	Soutien budgétaire	€1.5 million	28%	€420,000	2010-2011

Table 9: ICT-related Projects Funded under MIP in South Africa

No	Programme	Projects/Activity	Amount (Euros)	Status	Remark
1	EU Government Budget Support (GBS) - ICT Innovation Programme to support development and improved government service delivery	Mobile internet protocol television (IPTV), accesses through a cell phone network and has ability to create new players in the local film and broadcasting industry.	The total amount allocated to the EU GBS - ICT Innovation Programme for 2015 - 2017 is €8.8 million	The phase of the project funded under EU GBS-ICT Innovation Programme ended.	Currently the Department of Science and Technology (DST) is funding further R&D work of this technology. The Department of Communications has interest in supporting SMMEs to create services based on this technology.
2		mHealth integration platform, jointly developed with the Department of Health as a building block to the National Health Insurance system.		The phase of the project funded under EU GBS-ICT Innovation Programme ended	The system has the capability to integrate information from all spheres of government and improve document management.
3		Speech-enabled multilingual services delivery platform that can integrate information received from all 11 official languages in South Africa.		The phase of the project funded under EU GBS-ICT Innovation Programme ended	The aim was to utilise this technology at government services delivery points to get un-bias feedback on services delivered
4		Multi-Hazard Early warning field terminal information system at local municipalities.		The phase of the project funded under EU GBS-ICT Innovation Programme ended	The initial focus of deployment was in provinces of North West, Mpumalanga, Limpopo and KwaZulu-Natal.
5		Development of the Optical tomography-based fingerprint reader.		The phase of the project funded under EU GBS-ICT Innovation Programme ended	The work was done in partnership with the South African cyber security community, government agencies and the Departments of Home Affairs and the South African Social Security Agency (SASSA). The DST is currently funding the development of other systems that are based on the technology (IP) developed from the EU-BGBS – funded project, e.g. the Latent Fingerprint Acquisition System Minimum Viable Product.

6	EU Sector Budget Support - Innovation for Poverty Alleviation	Broadband4All / Wireless Mesh Network technology demonstrator project.	R 86.2 million	The pilot phase was between 2009-2014. Currently the project is in the commercialisation stage where some private entities have taken over certain aspects of it.	The project had the objective of demonstrating alternative business models to deploying communications infrastructure in rural areas.
7		Rollout of the Digital Doorways		Finished in 2013.	The aim was to provide people in rural and disadvantaged areas with freely accessible computer equipment and open source software, enabling them to experiment and learn without formal training and with minimal external input.

Table 10: ICT-related components in EDF10 Projects Funded in Tanzania

S/N	FINANCING AGREEMENT	S/N	TITLE	TOTAL BUDGET TZS	BUDGET ALLOCATED TO ICT TZS	TOTAL BUDGET EURO	ICT BUDGET EURO	ICT DESCRIPTION
I	EDF 10 Support to office of the NAO	1	10th EDF Support to the Office of National Authorizing Officer - Programme Estimate No 1	1,926,747,463.00	80,000,000.00			Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals
		2	Programme Estimate No 2	2,509,237,136.00	68,000,000.00			Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals
		3	Programme Estimate No 3	1,597,822,790.00	81,900,000.00			Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals
		4	Programme Estimate No 1	2,534,637,976.00	80,000,000.00			Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals
		5	Programme Estimate No 2	2,616,701,279.00	80,500,000.00			Computers and photocopiers, software maintenance, updates and licence renewals
		6	Programme Estimate No 3	1,518,977,197.00	31,500,000.00			Computers and photocopiers, software maintenance, updates and licence renewals
II	10th EDF Energy Programme	1	Increasing Access to Modern Energy Services in Kondor ward, Njombe District, Iringa region			1,767,244.00	43,900.00	Computers, printers, photocopiers, GPS, administrative software, telephone, internet

		2	Introducing a new concept for affordable biogas systems to connect 10,000 rural households in Tanzania			1,500,000.00	25,000.00	GPS recorders & IT support services
		3	Clusters Solar PV Project- lake zone			950,384.00	10,315.00	Computers
III	Support to Culture	1	Dar es salaam Centre for Architectural Heritage			1,163,976.00	31,800.00	Computers, Cameras, Printers, Sound systems, Projector, Cellphones, Internet, website development
		2	Cultural Heritage Conservation, Tourism and Sustainable Development in the Southern highlands of Tanzania			1,572,386.40	20,650.00	website development, Computers, Servers, Printers, Photocopy machines, Scanner, Software, Audio and Video cameras and GPS
		3	Promotion of Earth and Human Heritage of Ngorongoro by valorisation of the Oldupai and Laetolisites, local communities development and creation of the Ngorongoro geopark			2,273,353.00	12,000.00	Computers, Printers, photocopiers and accessories and telephone
		4	Traditional Music and Dance Preservation and Promotion in Northern Tanzania			1,758,711.00	46,156.00	Video and audio computers with software Research Archive, Notation Database Computer, Hard drives for backups, Office computers, photocopier, printers, server for networking, video cameras, Digital Audio recorders, networking hardware, security cameras, website and database management

		5	Heritage Centre on the site of the former Slave Market and Preservation of Christ Church Cathedral, Zanzibar			929,434.00	23,132.00	Computers, Printers, Networks, DVD player, Accounting software, Film Audio and visual display
		6	Promoting heritage resources in Kilwa to Strengthen Social Economic Development			625,000.00	26,350.00	Computers, cameras, Printers, GPS, Video projectors, Telephone and fax
IV	Trade and Agriculture	1	Trade policy and Standards Component	2,743,993,169.00	149,000,000.00			Website upgrading and database management, computers, photocopier, printers, database server, internet and software licence
		2	Trade policy and Standards Component	3,877,493,936.00	32,100,000.00			Computers, software, printers and Trainings on how to use software,
		3	Trade and Agriculture Support Programme			1,177,724.00	46,914.00	Computers, telephone and internet
V	Trade and Agriculture Phase II	1	Increasing smallholder Income through improved quality and market access of cotton produced in Tanzania	3,755,617,950.00	22,250,000.00			Internet, cellphones, ICT consumables, Printers, scanners and cameras
		2	Strengthening smallholder, income and employment from the production of quality tea			819,464.00	9,425.00	Computers, projectors and printers
		3	Strengthening smallholder, income and employment from the production of quality tea	2,005,537,566.90	4,253,126.38			Additional ICT equipments
		4	Strengthening smallholder, income and employment from the production of quality tea	707,493,978.00	2,761,467.00			Additional ICT equipments

			5	Improving Access to Markets Through Enhanced Capacity for Quality and standards compliance for coffee, tea, cotton, fisheries and horticultural products	1,817,786,000.00	25,380,000.00			ICT project Equipment
			6	Improving Access to Markets Through Enhanced Capacity for Quality and standards compliance for coffee, tea, cotton, fisheries and horticultural products	2,178,476,000.00	41,105,500.00			Computers, Graphic software, projectors, printers and external disks, Accounting Package and website development
			7	Commercial Agriculture for Small Farmers in Horticulture			752,099.79	10,424.00	Computers, Printer and contribution to tel/fax
			8	Strengthening Smallholder Producer's Vegetable Production and Marketing			1,277,278.00	44,336.00	Computers, Printer, modems for internet, photocopier machines, internet, telephone, fax and Gateway software-installation, training and maintenance
			9	Improving Production and Marketing of High Value Horticulture Produces for Smallholder Farmers in Uluguru Mountains and Ruaha River Basin through Increased know how and Market Support services (MALIMBICHI)			1,875,000.00	32,230.00	Computers, Printers, Camera, Internet and telephone
			10	Horticulture Value Chain development in Lindi and MtwaraRegions			1,632,336.00	12,684.00	Computers, printers, Wireless Access Point, Projector and Cameras

		11	Action programme for strengthening measures for fish quality and standards compliance	2,296,404,516.00	34,500,000.00			Internet services, backup devices, Cameras, GPS and computers.
		12	Action programme for strengthening measures for fish quality and standards compliance	2,215,571,553.00	15,900,000.00			Internet services, printers, Fax machine and website hosting.
VI	Global Climate Change Alliance	1	Empowering Vulnerable Rural Communities to Adapt and mitigate the Impacts of Climate Change in Central Tanzania			703,049.00	9,900.00	Computers, External Drives, Cameras, Projectors, photocopiers and printers
		2	ECO-BOMA: a climate-resilient model for Maasai steppe pastoralists			1,796,262.50	46,550.00	Computers and accessories, cameras, GPS, internet, fax, telephone, website development and IT personnel cost
		3	Igunga Eco- Village Project			2,132,480.00	46,915.00	Computers, Cameras, Internet, telephone, IT system for weather information sharing, IT personnel contracts
		4	Integrated Approaches for Climate Change Adaptation in the East Usambra Mountains			1,364,449.00	30,392.00	Telephone, Internet, Computers, cameras, GPS and Printers
		5	Ecovillage Adaptation to Climate Change in Central Tanzania			1,868,974.00	37,500.00	Telephone, GPS, External hard drives, Cameras, video cameras, Printers and computers
		6	Scalable Resilience: Outspreading Islands of Adaptation			1,250,000.00	49,640.00	IT personnel cost, Website development, telephone and fax, audio and video equipments, GPS device, Mapping software and computers

		7	Enhancing climate change adaptation and mitigation capacities of vulnerable communities in eco-villages of different ecosystems of the Uluguru mountains			722,000.00	9,879.00	Computers, photocopier, printer, scanner, projector, video player, digital camera, GPS
VII	Millennium Development Goals	1	Support to the National Panel Survey	986,932,000.00	1,000,000.00			Website development
		2	Support to the National Panel Survey	5,654,762,011.00	248,685,000.00			Website development, data processing, Computer and IT equipment
		3	Support to the National Panel Survey	4,453,054,221.00	355,000,000.00			Computers, printers and photocopier machines
IX	Road Transport Sector	1	Capacity building of the Transport Sector in Tanzania			350,000.00	45,000.00	Improve and operationalize transport sector database
	TOTALS	**41**		**45,397,246,741.90**	**1,353,835,093.38**	**30,261,604.69**	**671,092.00**	

Table 11: ICT-related components in EDF 11 Projects funded in Tanzania

S/N	Financing Agreement	S/N	Type Contract	Contract Number	Title	Total Budget Tzs	Budget Allocated to ICT Tzs	Total Budget Euro	Budget Allocated to ICT Euro	ICT Description	Duration
I	Technical Cooperation Facility 1 (TCF 1) Under 11th EDF	1	Programme Estimate No 1	FED/2018/397-330	Joint Project Monitoring and Formulation	2,139,771,002.00	90,996,703.00	767,218.00	32,627.00	Purchase of Computers and Printers	2nd May 2018 - 1st November 2019
	11th EDF support to the Office of the National Authorising Officer	2	Programme Estimate No 1	FED/2015/367-058	11th EDF Support to the Office of the National Authorising Officer (NAO)	3,283,480,827.00	249,057,284.00	1,318,558.00	103,640.00	Hosting and constant updating ONAO website, purchase of payroll software , Computers and photocopiers, software maintenance, updates and licence renewals	01st October 2015-31st March 2017

II		3	Programme Estimate No 2	FED/2017/385-229	11th EDF Support to the Office of the National Authorising Officer (NAO)	3,226,091,649.00	135,622,923.00	1,366,409.00	57,443.00	Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals	01st April 2017-30TH September 2018
		4	Programme Estimate No 3	FED/2018/399-557	11th EDF Support to the Office of the National Authorising Officer (NAO)	3,235,429,716.00	117,500,000.00	1,221,802.00	44,372.00	Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals	01st October 2018-30th September 2019
	TOTALS					**11,884,773,194.00**	**593,176,910.00**	**4,673,987.00**	**238,082.00**		

Table 12 below provides an overview of EDF10 and EDF11 in terms of funding level and focal areas agreed for each programme.

It is positive that the National Indicative Programmes for EDF11 incorporate "*exploiting the potential of Information and Communication Technologies*" as one of the cross cutting factors to be considered in the focal sectors, when designing sector interventions. It is clear that ICT should be an important horizontal enabler in Education, Health, Rural Development, Agriculture, Water and Transport. Africa is demonstrating leadership in innovative exploitation of mobile technologies and applications - it would be positive if this expertise is leveraged when developing sectoral applications.

Table 12: Overview of EDF10 & EDF11 (IST-Africa Partner Countries)

IST-Africa Partner Country	EDF10 Funding (2007 – 2013)	EDF10 Focal Areas	EDF11 Funding (2014 – 2020)	EDF11 Focal Areas
Angola	€214 million +€13.9 million	Governance and Support to Economic and Institutional Reform; Human and Social Development; Rural Development, Agriculture and Food Security	€210 million	Technical and Vocational Education and Training and Higher Education; Sustainable Agriculture; Water and Sanitation
Botswana	€73 million + €4.3 million	Human Resources Development, Growth Promotion and Poverty Reduction (Empowering Civil Society, Technical Cooperation Facility)	€33 million	Inclusive and Sustainable Growth – Education Sector; Public Sector Reforms; Measures in Favour of Civil Society; Support Measures and NAO Support
Burundi	€210.7 million + €45.6 million	Health, Rehabilitation, Rural Development, Food Security, Budget Support, Good v Governance, Civil Society	€432 million	Sustainable Rural Development for Nutrition; Healthcare; State Building; Sustainable Energy; Support to Civil Society
Cameroon	€239 million +6.9 million	Governance, Trade and Regional Integration	€282 million	Governance (Public finance, business environment and sustainable governance of natural resources; and State of law) and Rual Development (Regulatory framework for agric sector and agricultural productivity).

IST-Africa Partner Country	EDF10 Funding (2007 – 2013)	EDF10 Focal Areas	EDF11 Funding (2014 – 2020)	EDF11 Focal Areas
Egypt (ENPI replaced by ENI (European Neighbourhood Instrument) in 2014)	€558 million (2007 – 2010) + €440.29 million (2011 – 2013)	2007 – 2010 Support Reforms in Democracy, Human Rights and Justice, Developing Competitiveness and Productivity of Egyptian Economy, Ensuring the Sustainability of the Development Process; 2011 -2013 Support Reforms in Democracy, Human Rights, Good Governance and Justice, Developing Competitiveness and Productivity of the Economy, Sustainability of the Development Process	€756 - 924 million Indicative allocation 2014 - 2020 €210 - 257 million indicative allocation 2014 - 2015	2014 - 2015 priority areas include: Poverty alleviation, Local Socio Economic Development and Social Protection; Governance, Transparency and Business Environment; Quality of Life and Environment
Ethiopia	€689 million	Transport and Regional Integration, Rural Development and Food Security, Macro-economic Support and Governance	€745 million	Sustainable Agriculture and Food Security, Health, Roads (Phasing out) and Energy (Phasing in), Civil Society and Synergetic Governance, Support Measures
Kenya	€399.4 million	Transport Infrastructure, Agriculture and Rural Development, Macroeconomic Support	€435 million	Food Security, Sustainable Infrastructure, Accountability of Public Institutions, Support Measures
Lesotho	€136 million + 2 million	Human Development, Infrastructure	€142 million	Water, Energy, Governance
Malawi	€436 million +€15 million	Rural Development, Agriculture, Food Security and Natural Resources; Transport; General Budget Support;	€560 million	Governance, Sustainable Agriculture, Secondary Education and Vocational Training
Mauritius	€51 million +€12.4 million	Improve Competitiveness for Equitable Development		

IST-Africa Partner Country	EDF10 Funding (2007 – 2013)	EDF10 Focal Areas	EDF11 Funding (2014 – 2020)	EDF11 Focal Areas
Mozambique	€622 million + €12.1 million	Transport Infrastructure; Agriculture and Rural Development; Support Measures	€734 million	General Budget Support; Rural Development
Namibia	€103 million	Rural Development, Human Resources Development, Support Measures	€68 million	Education (including pre-primary, early childhood and vocational); Rural Development
Senegal	€317 million + €23m Emergency Support + €60m Sectoral/NGO Support	Trade/Regional Integration, Sanitation	€347 million	Democratic Governance, Sustainable Agriculture and Food Security, Water and Sanitation
South Africa (Multi-Annual Indicative Programme MIP)	€980 million	Employment Creation; Capacity Development for Service Delivery and Social Cohesion; Governance	€241 million	Employment Creation; Education, Training and Innovation; Building a Capable & Developmental State
Eswatini	€63 million + €0.9 million	Health and Education, Improve Water Supply, Support Measures	€62 million	Agriculture and Food Security, Social Protection, Support Measures
Tanzania	€555 million + €10.1 million	Infrastructure, Communications, Transport; Trade and Regional Integration; Macroeconomic Support	€626 million	Good Governance and Development, Sustainable Agriculture; Energy
Tunisia (ENPI replaced by ENI (European Neighbourhood Instrument) in 2014)	€300 million (2007 – 2010), €240 million (2011 – 2013)	[2007 – 2010 Economic Governance, Competitiveness and Convergence with the EU, Improved Graduate Employability, Sustainable Development] [2011 – 2013 Employment and Social Protection, Integration, competitiveness of companies, justice sector]	2014 - 2015 €234 million Indicative budget 2014 - 2020 from €725 - €886	Socio-Economic reforms for inclusive growth, competitiveness and integration; Strengthening fundamental elements of democracy; Sustainable regional and local development
Uganda	€439 million +€21.9 million	Infrastructure, Rural Development, Climate change mitigation (Forestry) and Macroeconomic Support	€578 million	Transport Infrastructures, Food Security and Agriculture, Good Governance

1.4   Conclusion and Recommendations

This updated report has identified that in the case of IST-Africa Partner Countries, ICT, Innovation and Research Capacity continues to be primarily supported by the European Commission, Finland, Sweden, Norway, Germany, Italy, France, Switzerland, Ireland, Netherlands, UK, Belgium, Portugal, India, South Korea, Republic of China on Taiwan, China, Canada, Japan, African Development Bank, World Bank, ITU, IICD and various UN Agencies. The type of activity and the country in which the intervention can take place continues to be dictated by the Programme countries associated with each donor and the national priorities defined by the government in each intervention country.

Chapters 2 - 18 of this report provide more details on the projects and activities funded in each IST-Africa partner country.

In summary there are a number of points that should be considered in future planning:

1. Strong Awareness of ICT Potential as Horizontal Enabler

It is clear that there is now a clear awareness of the key role ICT can and should play as a horizontal enabler in sectoral focused projects and initiatives.

Based on the survey of donor organisations there is also a strong interest in activities supporting ICT and Innovation across IST-Africa partners countries. Increasingly donors are focusing on strengthening innovation ecosystems in tandem with supporting research capacity building. There is a general move away from traditional "aid" towards supporting innovation and entrepreneurial activities to strengthen job creation efforts by national Governments.

Recommendation: Since donors can only support national priorities based on National Development Plans, it is recommended that African Governments, the RECs and the African Union collaborate to synthesise and clearly articulate the critical role of ICT and the necessity to incorporate it as a horizontal enabler in all future supporting projects, irrespective of funding programmes. This has already been facilitated to a considerable extent by a rewording of EDF11 as noted below. It is also highlighted in the Sustainable Development Goals and the Digital4Development framework.

2. Actively Leverage ICT Adoption in EDF11 projects

It is positive that the IST-Africa partners with assistance from their National Authorising Authority (NAA) identified EDF10 projects & MIP projects with ICT components in Cameroon, Ethiopia, Lesotho, Malawi, Mauritius, Namibia, Tanzania, Senegal, Eswatini and South Africa.

Building on this it is also positive that the National Indicative Programmes for EDF11 incorporate "*exploiting the potential of Information and Communication Technologies*" as one of the cross cutting factors to be considered in the focal sectors, when designing sector interventions. It is clear that ICT has a critical role to play as a horizontal enabler in Education, Health, Rural Development, Agriculture, Water and Transport related activities both at national and cross-border level. Africa continues to demonstrate leadership in innovative exploitation of mobile technologies and applications - it is important that this expertise is leveraged when developing sectoral applications.

Recommendation: When planning the implementation of EDF11 projects at national level, it is recommended that the National Authorising Authority and sector Ministries responsible for each of the national focal areas actively engage with the Ministry of ICT as well as National Councils for Science and Technology to gather and take account of their input on how ICT can be embedded into the project designs from the start to maximise impact. Unfortunately, this does not currently happen. At the encouragement of IST-Africa, Partner organisations now actively engage with NAA. The thematic studies being undertaken in the context of the Digital4Development Medium Term actions will assist in informing both EU Delegations and National Authorising Authorities.

3. Move from Infrastructure-related Projects to Application Focused Projects

Infrastructure in Africa is dramatically improving with national fibre optic networks, national Internet Exchange points and Points of presence, and increasing cross-border fibre optic links to facilitate keeping continental traffic within Africa. Projects like AfricaConnect, AXIS and Regional Communications Infrastructure project are laying an important foundation for the future. Digital migration is also opening up new opportunities. As a result, the types of projects that should be funded over the next 5 - 10 years must change to take cognisance of this new environment.

Recommendation: It is important that future Innovation-related programmes maximise the potential benefits of digital infrastructure to support ICT applications development addressing societal challenges while also supporting sustainable socio-economic development. It is critical that Africa develops cooperative programmes with Europe (which has an extensive experience in content creation) to encourage and inform local content development across the African continent.

4. Importance of Research and Innovation Funding

The dramatic increase in African participation in FP7 and the continued strong participation in Horizon 2020 illustrates the importance of the activities of IST-Africa in facilitating greater awareness of African research and innovation capacity and the strategic benefits of international and cross-border collaborative research, learning from peers in other countries and sharing knowledge and expertise. Increasingly there is a greater focus on innovation than research. While in certain respects this is to be welcomed, it is important to maintain and further strengthen the research and innovation culture in the public, private and education and research sectors.

Participation from African research organisations during Horizon 2020 is also very positive (considering how competitive it has become for all potential consortia submissions) and it is important to build on the credibility this success has creation. The significant response both from Africa and Europe to the ICT-39-2015 Call of Horizon 2020 (45 proposals with 194 participants from Africa) focused on initiating collaborative research and innovation projects addressing the end-user communities in Africa in relevant thematic areas also reinforces the opportunity (as well as the strong appetite) for productive cross-border cooperation. This was reinforced by the strong response to the ICT-39-2017 Call which followed for Innovation Actions (71 proposals with 659 participants).

There is a continued strong commitment by some donor countries to support PhD and Masters students. While this is important, it is also essential that these researchers are provided with the necessary skills and community introductions to adequately leverage the contacts that they make abroad to initiate and co-design research and innovation projects with their peers in other countries.

To complement funding for research and innovation under Horizon 2020, it is critical that African Member States prioritise the creation of national research funds to assist researchers in undertaking multidisciplinary research at national level to build up the track record required for international research cooperation. There are many countries across Europe and increasing across Africa who have experiences of developing national funding programs that would be delighted to share insight.

Recommendations: While many African government have now appointed National Contact Points (NCPs) for ICT and other relevant thematic areas across Horizon 2020, these are often significantly under resourced. Many have complained that they are expected to do this work around existing work commitments, which damages both the level of enthusiasm and the credibility of the NCPs. To support not only greater awareness of opportunities under Horizon 2020 but also the submission of credible proposals addressing national and international societal challenges, it is recommended that African Governments prioritise training and support for National Contact Points and allocate adequate time as part of their job descriptions that it is clear that being a NCP is a vital function to support greater maturity of the innovation ecosystems across Africa. It is also recommended that responsible Ministries also set aside at least some budget each year to bring together key actors in the research and innovation ecosystems of their respective countries to share experiences and better understand what other research and innovation actors are currently doing.

It is recommended that donors consider also contributing to establishing and maintaining national research and innovation funding addressing relevant multidisciplinary activities that are well aligned with national priorities and relevant to national community stakeholders. Finland and the UK have started to support national innovation funds in Southern Africa (SAIS2) and in Tanzania. (Human Development Innovation Fund, TANZICT) in recent years.

It is recommended that the European Commission continues to include dedicated calls focused on addressing African priorities under the 2020 Workprogramme of Horizon 2020 and future Work Programmes within HorizonEurope in an ambitious number of relevant thematic areas. This includes regular and scaled funding for Research and Innovation actions, Innovation actions and Coordination and Support Actions to support this community and engagement with this community.

The expected ROO (Return on Objective) can include: strengthening African Innovation Ecosystems, thus enhancing self-reliance and maximising impact of investment in research and innovation; enhanced prioritisation of research and practitioner activities by education and research stakeholders (particularly in relation to tenure track); as well as African innovations designed for resource constrained environments in cooperation with local communities. This innovation can then potentially be adapted and applied with the diverse range of resource-constrained communities that exist across Europe.

2. REPUBLIC OF BOTSWANA

2.1 Introduction

The Republic of Botswana is in Southern Africa. Botswana is bordered by Namibia on the west and north, Zambia at a narrow strip in the north, Zimbabwe on the east, and South Africa on the east and south. Botswana has an area of 581,730 sq km with an estimated population of 2,154,863 million inhabitants (2017 Botswana Demographic Survey) and a literacy rate of 88.5%. 63% percent of the total population is between 15 and 64 years of age. Gaborone, the capital city, has a population of about 269,000 (2018). The official language is English.

Botswana is an upper middle-income country. The first National Vision elapsed in September 2016. It has been replaced by Vision 2036, which aims to transform Botswana from an upper middle-income country to a high income country by 2036. Botswana Statistics indicates that the 2017 Real GDP per capita is 40,779 pula. Botswana has relatively good infrastructure, fibre-optic networks and a National Backbone. The first National Information and Communications Technology Policy was approved by Parliament in 2007 [Maitlamo National Policy for ICT Development 2007] and the revised Research, Science, Technology and Innovation Policy was approved in 2012. The National Broadband strategy and e-Gov strategy are being implemented. The National Cyber Security Strategy and ICT Empowerment for Youth, Women and People with Disabilities strategy are at the final stage of approval. The Botswana Innovation Hub was set up to encourage inward investment and support research, training and job creation in the areas of ICT, Bio-Technology, Energy and Mineral Technology. There are quite a lot of ICT Initiatives and projects funded at national level focused on reducing the digital divide and supporting the Information Society (Connecting Communities Programme, Kitsong Centres, Thuto-Net, Broadband Strategy, Universal Access), providing eGovernment services and supporting Innovation and Entrepreneurship. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018.*

In relation to telecommunications, there were 142,602 fixed phone lines subscriptions and 3.204 million mobile phone subscriptions as at Quarter 2 2018 (Information and Communication Technology Stats Brief, Quarter 2 2018, Statistics Botswana) There was a total of 1.658 million internet subscribers as at Q2 2018 - 53,057 ADSL broadband subscriptions and 1.605 million mobile internet subscribers (Botswana Communications Regulatory Authority). Tele-density of mobile telephony was 157% in March 2018 and tele density for fixed telephony was 7%.

There are 4- public universities and 4 private Universities. In total there are about 40 Higher Education Institutes including DVET of which about 20 are public and the rest private Higher Education Institutes.

2.2 Bilateral & Multilateral Cooperation

Botswana is a signatory to the Cotonou Partnership Agreement and is an Observer of the TDCA (Trade Development Cooperation Agreement) EU-RSA.

Botswana is now considered to be a middle-income country. While this is a great achievement, the level of funding available through bilateral cooperation with EU Member States has been reduced gradually over the past decade. There are currently Embassies for France, Germany and UK in Gaborone. The Swedish Embassy closed in recent years. Cooperation with France is primarily related to promotion of French teaching in Botswana through a cooperation agreement between Alliance Francaise and the University of Botswana. Cooperation with the British High Commission in Gaborone has historically been focused around governance, energy and environment.

Support for ICT and Innovation related activities are primarily provided by European Commission (FP7, H2020, EDF), Finland, Sweden and Germany.

Botswana has active bilateral agreements with South Africa, China, India, Japan and Vietnam.

2.2.1 European Commission

Under EDF10 (2008 - 2013) Botswana was allocated €73 million, which was focused around Human Resource Development, Growth Promotion and Poverty Reduction.

Under EDF11 (2014 - 2020), Botswana is allocated €33 million with focal areas including Inclusive and Sustainable Growth – Education Sector; Public Sector Reforms; Measures in Favour of Civil Society; Support Measures and NAO Support.

Botswana is one of the beneficiary countries in the Digital4Development Cyber Resilience for Development project. This project aims to strengthen Cybersecurity Policy, Strategical, and Coordination Frameworks, increase Cybersecurity Incident Response Capabilities and foster networks of cyber expertise and cooperation. During Q4 2018 a project coordinator has been set up in Botswana with responsibility for supporting the development of detailed action plans to deliver National Cyber Security Strategies. They are also planning project launch events due in early 2019

Botswana was a beneficiary under EDF9 @CP-ICT Capacity Building Programme (Internet Governance and ICT Policy 2009 - 2011), has been successful in securing participation in 9 FP7 projects and 3 Horizon 2020 projects to date.

2.2.1.1 Framework Programme 7

Botswana secured participation in **9** FP7 projects – ICT (4 projects), INCO (1 project), Environment (1 project), Health (2 projects) and Food, Agriculture and Biotechnology KBBE (1 project).

The Department of Research Science and Technology (DRST) initially hosted IST-Africa training workshops in Gaborone without funding during 2006 - 2007. Botswana through DRST formally joined the IST-Africa Initiative as a partner in 2008 and this responsibility was taken over by the Ministry of Transport and Communications in 2012 under the Department of Telecommunications and Postal Services (DTPS). DRST was also involved as a partner in the extended phase of CAAST-Net. DTPS are actively encouraging research institutions to build international partnerships and work to increasing the number of participations in the Framework Programme.

As a result of an IST-Africa Training Workshop on FP7-Africa 2010 hosted by DRST in Gaborone on 23 September 2009, the University of Botswana successfully participated in the submission of the RN4CAST proposal and the HURAPRIM[8] proposal focused on Primary Health Care in Africa in cooperation with the University of Gent (BE), University of Oxford (UK), Medizinsche Universitaet Vienna (AT), Wits University (ZA), Mbarara University of Science and Technology (UG), Ahfad University for Women (SD) and Universtite de Bamako (ML), which commenced in March 2011.

As part of its IST-Africa activities MTC circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, creates awareness of research centres in Botswana during international meetings and has undertaken an initial mapping of research capacity.

2.2.1.2 Horizon 2020

Through out Horizon 2020, DPTS, Ministry of Transport and Communications has circulated IST-Africa Guides on opportunities for cooperation under Horizon 2020. MTC hosted an IST-Africa Horizon 2020 Workshop in Gaborone on 21 November 2013. An IST-Africa workshop focused on ICT-39-2017 was hosted by DPTS, MTC in Gaborone on 17 November 2016. DTPS, MTC hosted IST-Africa 2018 in Gaborone and as an output of this supported the 2nd eHealth Workshop in Gaborone in October 2018.

Up to September 2018, Botswana organisations are involved in 3 Horizon 2020 projects with research funding of over €250,000 across a range of thematic areas:

➢ FOOD, H2020-SFS-2014-1 - **PROIntensAfric**a (CSA - Coordination & support action) - Centre for Coordination of Agricultural Research and Development for Southern Africa

➢ H2020-WATER-2015 - **AfriAlliance** (CSA - Coordination & support action) - Waternet Trust

➢ H2020-ICT-2016-INT - **IST-Africa 2016-2018** (CSA - Coordination & support action) - Ministry of Transport and Communications

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[8] http://www.huraprim.ugent.be/drupal/

2.2.1.3 Capacity-building programme and Community Development in Internet Governance and ICT Policy (ACP/EDF9)

A Programme focused on Capacity-building and Community Development in Internet Governance and ICT Policy[9] was funded under the ACP-ICT Call (ACP/EDF9). This project ran from 2009 – 2011 undertaking online training courses on Internet Governance and ICT Strategy, provide training through workshops and policy immersion fellowships.

African Target Countries: Botswana, Burundi, Congo and Kenya

Main partner: Diplo Foundation

Partner in Botswana: Botswana Information Technology Society[10]

Funding: 960k€ from EDF9 (@CP-ICT capacity-building programme) 2009-2011

2.2.2 Finland

The **Southern Africa Innovation Support Programme** (SAIS)[11] focused on supporting a regional innovation system in SADC and promoting collaboration in relation to innovation systems between Botswana, Mozambique, Namibia and Zambia. It aimed to establish sustainable knowledge-sharing networks for innovation support and partnerships; strengthen human capacity relation to innovation; adapt and replicate best practices and build institutional and organisational elements for national and regional innovation systems. SAIS supported Science Parks, incubation and entrepreneurship, co-creation and open innovation, mobile applications, and renewable energy and inclusive/frugal innovation. The Botswana Innovation Hub (BIH) was the national partner.

Partners: Botswana Innovation Hub (BIH), Namibia Business Innovation Centre (NBIC), National Technology Business Centre, Zambia and Mozambique ICT Institute (MICTI)

Funding: €6.2 million, Ministry of Foreign Affairs Finland 2011 – 2015

Southern Africa Innovation Support Programme (SAIS 2)

A follow on project, SAIS 2 is focused on supporting the growth of new businesses through strengthening innovation ecosystems and promotion of cross-border collaboration between innovation players in Southern Africa. It is supported by the Ministry for Foreign Affairs (MFA) of Finland, in partnership with the Ministry of Infrastructure, Science and Technology, Botswana; Ministry of Higher Education, Training and Innovation (Namibia); Ministry of Education, Science and Technology, Tanzania; Ministry of Higher Education, Zambia; Department of Science and Technology, South Africa and the Southern African Development Community (SADC) Secretariat. It is supporting Sustainable Development Goals 4, 8, 9 and 17. It is focused on supporting institutional capacity to support innovation and enterprise development, improved enterprise capacity to

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[9] http://www.diplomacy.edu/ACP/Programme/default.asp
[10] http://www.bits.org.bw/index.htm
[11] www.saisprogramme.com

innovate and enter new markets and an improved enabling environment to support inclusive innovation activities in the region.

SAIS2 is managed by a Programme Management office, hosted by NCRST in Namibia and implemented by focal points in Botswana, Namibia, South Africa, Tanzania and Zambia.

The SAIS2 Innovation fund publishes competitive Calls for proposals to award grants for locally implemented projects in the five partner countries. The first Call for Proposals ran from February to April 2018 with three funding opportunities focused on cross border projects to support development o f institutional capacity for regional innovation cooperation; Scaling Enterprises through stronger Innovation Support organisations and Improving enabling environment for inclusive activities in the region. Four projects were selected for funding under each funding windows with twelve projects funded in total. The second Call for Proposals runs from November 2018 to January 2019.

SAIS 2 aims to support three capacity building programs for Innovation Fund grantees: Data Collection and Analytics Framework Training; Accelerator Programme for Entrepreneurs and Innovation Intermediaries and Inclusive Innovation and Capacity Building Program.

SAIS2 supported Connected Hubs to share best practices in innovation support through online and offline training sessions. In 2018 it organised the Annual Southern Africa Innovation Forum. Connected Hub Members during 2018 included Botswana Innovation Hub, Gen BW; National Commission on Research Science and Technology, Namibia; Namibia Business Innovation Institute; COSTECH, Tanzania; BuniHub, Tanzania; Technology Innovation Agency, South Africa; mLab, Southern Africa; National Technology Business Centre, Zambia and BongoHive, Zambia.

National Focal Points: Botswana Innovation Hub (BIH), National Commission on Research Science and Technology Namibia (NCRST), Technology Innovation Agency, South Africa; COSTECH, Tanzania; National Technology Business Centre, Zambia

Funding: €9.3 million, Ministry of Foreign Affairs Finland 2017 - 2021

2.2.3 Sweden

Botswana Speaks[12] was an eDemocracy project focused on supporting citizens, leaders and local kgotla assemblies in four constituencies of Botswana to share their views and policy concerns with their elected representative. It aimed to enable the National Assembly to enhance work efficiency and increase policy responsiveness with constituencies through the use of eParticipation and ICT tools. The project ran from September 2012 – April 2014 with a pilot running from April 2013. This project leveraged the experience and outputs from the Africa4All Parliamentary Initiative, co-funded under the ACP-ICT Programme.

Partners: The Parliament of Botswana, eGovlab (Department of Computer and Systems Sciences, Stockholm University), Gov2u

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[12] http://www.botswanaspeaks.org/

Funding: SIDA

2.2.4 Germany

With Botswana's change in status to a middle-income country, official German development aid to Botswana was phased out in 1992 (financial cooperation) and 2007 (Technical cooperation). Germany has continued to support Botswana through SADC (Southern Africa Development Community) and the German Development Service (DED). Support from DED is based on an agreement whereby the Government of Botswana co-funds the work of DED and its development workers on specific agreed projects in Botswana. DED's areas of activity in Botswana are currently focused on Vocational Education, Road Safety and Transport Planning as well as Natural Resource Management. While some of the vocational education projects incorporate elements of ICT, it is not their predominant focus.

The German Government through its Ministry of Education and Research (BMBF) rolled out a highly intensive research project for the region (Angola, Botswana, Namibia, South Africa and Zambia). The project is aimed at emphasizing regional collaboration in and between participating countries and the focus is on climate change and its impact in the region. It is a multi million project and since its orientation is specifically on Climate Change, it is housed at the Department of Meteorological Services in the Ministry of Environment, Wildlife and Tourism.

3. REPUBLIC OF BURUNDI

3.1 Introduction

The Republic of Burundi is situated in Central Africa, sharing boundaries with Democratic Republic of the Congo, Rwanda and Tanzania. It is a landlocked country and has a surface area of 27,830 sq km, made up of 17 provinces. The population is estimated at 11.844 million inhabitants (July 2018 est. CIA World FactBook) with a literacy rate of 85.6%. 52% of the total population is between 15 and 64 years of age. The capital city is Bujumbura with a population of 899,000 (2018). Kirundi is the national language with French as the official language. Other languages spoken are Swahili and English.

Burundi joined the East African Community in 2007, which improves regional trade ties. The economy is predominantly agricultural with primary exports of coffee and tea. Burundi is currently dependent on bilateral and multilateral aid.

Burundi is slowly building up the institutions and infrastructure following twelve years of crisis up to 2005. The National ICT Policy was revised and adopted in 2011. The National Policy for Science, Technology and Innovation (STI) was adopted in 2011 with an implementation framework for 2014 - 2018. It was updated in May 2017 but has not yet been enacted. The decree to establish the National Commission for Science, Technology and Innovation was signed in July 2014. A fibre-optic project is currently running to provide ICT infrastructure across the country alongside development of the National Backbone. Vision Burundi 2025 recognises the importance of communication and information technologies to support economic growth and job creation. The Burundi Education and Research Network (BERNET) was established in 2014 and now all universities and research centres are connected. ICT initiatives are currently focused on eInfrastructure and eGovernment. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

In relation to Communications, there were 23,409 fixed line subscribers, 5.920 million mobile phone subscribers and 787,277 internet subscribers in 2017 with mobile penetration of 50.1% and internet penetration of 7% according to Agence de Regulation et del Controle des Telecom (ARCT). There are five ISPs, with approximately 3,914 fixed line Internet subscribers with 783,363 mobile Internet subscribers as at December 2017 (ARCT).

There are 7 public universities and 42 private institutions of Higher Education.

3.2 Bilateral & Multilateral Cooperation

Development support is primarily from European Commission, World Bank, ITU Belgium, France, Italy and Canada (IDRC).

From 2010 Belgium has focused its support primarily on three priority areas: Health, Education and Agriculture. Belgian Cooperation is focused on strengthening Justice and the modernization of the Civil Service remains a central concern for Belgian Cooperation. Technical support is provided in relation to education programmes in the Technical Schools.

The French Development Agency (AFD) contributes to the Common Fund for Education (CFE), which supports investments required from pre-school to higher education, text books for school children, and the construction of 36 schools and nine colleges (2009 – 2015). The PARES project (2007- 2012 $2 million) is focused on reform and revitalisation of higher education in Burundi through institutional support, strengthening institutional capacity of the University of Burundi and supporting teaching, learning and capacity building. France also supports the Great Lakes Inter-University Network (RIGL), chaired by the Rector of the University of Burundi, which includes 24 Universities in Burundi, Rwanda and the Democratic Republic of Congo.

Italy has funded a number of projects since 2008 related to youth (literacy and vocational training), health care for refugees returning to Burundi and improvement of sanitary conditions, food and water supply in the province of Cibitoke. These projects are primarily run by NGOs.

Support for ICT-related activities is primarily from the European Commission (FP7, H2020), ITU and World Bank. ITU support is focused on implementing infrastructure related projects (Broadband Wireless Network and National CIRT Establishment. The Government of Burundi is participating in a regional project with the World Bank and other partners to put the necessary infrastructure in place, which will ultimately provide the enabling environment for eGovernment applications.

3.2.1 European Commission

Burundi is a signatory to the Cotonou Partnership Agreement. Cooperation between the European Community.

Under EDF10 (2008 – 2013), €255 million euro was allocated with the focal areas including Health, Rehabilitation, Rural Development, Food Security, Budget Support, Good Governance, Civil Society. The National Authorising Authority did not identify any ICT-related components in the projects funded.

Under EDF11 (2014 - 2020) Burundi is allocated €432 million with focal areas including Sustainable Rural Development for Nutrition; Healthcare; State Building; Sustainable Energy; Support to Civil Society.

Through UbuntuNet Alliance and the Burundi Research and Educational Network (BERNET), Burundi is a beneficiary of the AfricaConnect 2 eInfrastructure project co-funded under EDF11.

3.2.1.1   Framework Programme 7

Burundi secured participation in **3** ICT FP7 projects: IST-Africa[13] 2010 – 2011, IST-Africa 2012 – 2013 and IST-Africa 2014 – 2015. This participation has facilitated MESRS to host training workshops on FP7 and Living Labs in Bujumbura for the research community, support capacity building and encourage the research community to start to build international links towards securing direct research funding into their institutions. This partnership building takes time to put in place. It will also take time to build up a research culture in institutions that are primarily focused on teaching. MESRS hosted an IST-Africa Living Lab Workshop in Bujumbura (26 - 27 September 2011) and is continuing to raise awareness of the potential of Living Labs methodologies in Burundi.

3.2.1.2   Horizon 2020

MESRS hosted an IST-Africa Horizon 2020 Workshop focused on ICT-39 in Bujumbura on 24 November 2014. It has circulated IST-Africa Guides to Horizon 2020 Calls.

As part of its IST-Africa activities MESRS circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, creates awareness of research centres in Burundi during international meetings and has undertaken an initial mapping of research capacity

Up to September 2018, Burundi is involved in 2 Horizon 2020 projects with research funding of €60,000 across a range of thematic areas:

➢ SOCIETY, H2020-INT-INCO-2014 - **RINEA** (CSA - Coordination & support action) - Ministere De L'Enseignement Superiet de la Recherche Scientifique

➢ H2020-ICT-2016-INT - **IST-Africa 2016-2018** (CSA - Coordination & support action) - Ministere De L'Enseignement Superiet de la Recherche Scientifique

3.2.3   Germany

Germany is supporting a project to interconnect the electricity grids as part of the regional initiative, through the development of electric power lines Rusizi III-Bujumbura. Germany is also supporting the sectoral programs focused on drinking water and sanitation, decentralization and poverty reduction.

3.2.4   ITU

ITU is implementing the Broadband Wireless Network Project in Burundi. The main outputs of this project include: Deployment of wireless broadband infrastructure in Burundi; Development of ICT applications; Training local experts on the operation of deployed wireless communication networks; Development of national ICT broadband network plans for Burundi that will deliver free or low cost digital access for schools and hospitals, and for underserved populations in rural and remote areas; Development of an impact assessment report and reporting.

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[13] http://www.ist-africa.org

Implementing Agency: ITU

Timeframe: 01/07/2009 – 31/12/2014

Funding Level: More than 1'000'000 CHF

More information at http://www.itu.int/ITU-D/projects/display.asp?ProjectNo=9BDI12011

ITU implemented the establishment of the National Computer Incident Response Team (CIRT) in Burundi. This project aimed to assist the Government of Burundi in building and deploying the technical capabilities and training required to establish the national CIRT. This will also assist in developing national cybersecurity capacity.

Implementing Agency: ITU

Timeframe: 01/01/2013 – 31/12/2013

Funding Level: 100,000 - 500,000 CHF

More information at http://www.itu.int/ITU-D/projects/display.asp?ProjectNo=7RAF08073-02

3.2.5 Regional Communications Infrastructure Project

The Regional Communications Infrastructure project is a regional project commencing with Burundi, Kenya and Madagascar. It is focused on the enabling environment, connectivity and preparation for eGovernment applications. The project in Burundi was restructured in April 2013 with the project life extended until April 2014. Phase I is starting to go into service.

Implementing Organisation in Burundi: Ministère de la Communication et des Médias

Partners: World Bank, The African Development Bank, Agence Française de Développement, The Development Bank of Southern Africa, The UK Department for International Development, The European Investment Bank, The European Union, KfW Bankengruppe (German development bank) and The Swedish International Development Cooperation Agency.

Timeframe: 21/08/2007 – 31/12/2016 (Extended timeframe)

Total Project cost: $201.9 million (IDA has contributed $18.8 million in Burundi)

More information at http://www.worldbank.org/projects/P094103/regional-communications-infrastructure-project?lang=en

4. CAMEROON

4.1 Introduction

The Republic of Cameroon is situated in Central Africa, sharing boundaries with Nigeria to the west, Chad to the northeast, Central African Republic to the east, Congo, Gabon and Equatorial Guinea to the south with direct access to the Atlantic Ocean to the southwest. It is a unitary state, with a surface area of 475,442 square km, made up of ten regions subdivided in to fifty-eight (58) divisions and further subdivided into 375 districts currently in the process of decentralisation. The population as at July 2018 was estimated at 24,640 million inhabitants with a literacy rate of 75% (CIA World Factbook). 54.6 percent of the total population is between 15 and 64 years of age. Yaoundé, the capital city, has a population of 3.412 million (2018) and Douala has a population of 3.66 million (2018). The official languages are English and French.

Cameroon plays an important economic role in Central Africa. There is a good Policy Framework in place (ICT Policy 2007, Electronic Communications Law, Cybersecurity Law and Electronic Commerce Law, Cameroon Digital Economy Strategy). eInfrastructure is gradually improving with a national backbone of over 6,000 km of fibre optic cable, a fibre optic loop in Douala with a second laid in Yaoundé (Capital) and the establishment of a National Internet eXchange point (IXP) in Douala and Yaoundé. There are 150 operational tele-centres, with a further 30 being put into service and 16 under construction. ICT Initiatives are primarily focused on eGovernment Services (including Legal and Regulatory Framework), National PKI, ICT Programmes in Primary and Secondary Schools, National Identity Card Computerisation and Biometric Passports. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

In relation to Communications, according to July 2017 figures (CIA World FactBook), there were 699,055 fixed phone lines in use compared with 19.7 million mobile phones. There were 6.12 million Internet users as at June 2017, representing 25.0% of the population. This increase is due to the introduction of 3/4G technologies and availability of low cost smart phones at national level.

Cameroon has a good research base and experience in collaborative research with 8 public Universities (University of Yaoundé I; University of Douala; University of Dschang; University of Buea; University of Yaoundé II; University of Ngaoundere; University of Maroua and University of Bamenda), over 180 private institutions for Higher Education and several laboratories.

Bilateral and multilateral support for ICT / STI related activities is primarily from African Development Bank, World Bank, European Commission (FP7, EDF10) and China.

4.2   Bilateral & Multilateral Cooperation

There are eight European Embassies (Germany, France, Spain, Italy, Netherlands, UK, Netherlands and Belgium) as well as an EU Delegation in Yaoundé. France, Germany and the EU delegation are particularly active in the areas of Health, Rural Development, Governance and Environmental issues, while the UK Embassy takes a particular interest in Human Rights.

France is active in Cameroon mostly through the Agence Française de Développement (AFD). French bilateral aid in Cameroon is specifically targeted at poverty reduction.

Bilateral and multilateral support for ICT and Innovation related activities is currently primarily from the European Commission (FP7, H2020, EDF10, EDF11), African Development Bank and World Bank.

4.2.1   European Commission

Under EDF10 (2008 – 2013), €245.9 million was allocated with the focal areas including Governance, Trade and Regional Integration. ICT components were leveraged in a number of projects under EDF10 as outlined below.

Table 1: ICT related Components within EDF10 Projects Funded in Cameroon

No	Program	Project/Activity	Amount (Euros)	Status	Remark
1	Public Finance Reform Support Program	Development of an integrated system of human resource management and payroll of government employees (SIGIPES II)	2,728,300	Ongoing	Overall cost of the project: 4 095 000 euros, Cameroonian Government covers the rest
2		Elaboration of a set of specifications for the purchase of a software package of an integrated tax management system	106,444.80	Ended	Reception date: January 2014
3	Customs Modernisation Support Program	Acquisition of ICT related equipments in Custom Offices Nationwide	303,562.62	Ended	Reception date: June to July 2013
4		Acquisition of Electronic Luggage Scanner at Douala International Airport	539,905.02	Ended	Reception date: September 2013
5		Acquisition of Solar Energy Plates in some Custom Offices Nationwide	344,767.50	Ended	Reception date: May 2014
6	Electoral Process Support Project in	Acquisition of ICT related equipments	48,058.81	Ended	Reception date:

| | Cameroon | | | | February to May 2012 |

Under EDF11 (2014 - 2020) Cameroon is allocated €282 million with focal areas including Governance (Public finance, business environment and sustainable governance of natural resources; and State of law) and Rural Development (Regulatory framework for agric sector and agricultural productivity). ICT components are planned to be leveraged in a number of regional projects under EDF11 as outlined below.

Table 2: Projects with ICT components planned under EDF 11 in Cameroon

No.	Project Description	Total Cost Envelope	Notes
1	Provide an evolving knowledge base for ICT in the region with an understanding of the economic, social, environmental and legal issues of digital society in an overall ICT perspective in the Central African region for 5 to 10 years	€2 million	EDF11 projects are coordinated at regional level (Cameroon, Gabon, Congo, Equatorial Guinea, Chad and Central Africa Republic).
2	Provide decision support to governments, regulators, investors and users by identifying technical, economic and organizational solutions appropriate to the characteristics of the region and its various components, geographical and economic areas, including access to populations less favoured and distant		The projects are still at initiation state, the cost of each project will be determined based on its need
3	Evolving action Plan of technical, economic and organizational ICT needs and solutions for the region and its various components		
4	Regional telecommunications strategic plan with costing of investment needs and needs assessment for universal service support funds		
5	Regional telecommunications strategic plan with costing of investment needs and needs assessment for universal service support funds		
6	Proposal of concrete plans for the implementation of the strategic plan in the countries		
7	Regional Interuniversity Network in ICT providing training and scientific advice to the authorities		

Through WACREN and the Cameroon Research and Educational Network (RIC), Cameroon is a beneficiary of the AfricaConnect 2 eInfrastructure project co-funded under EDF11.

4.2.1.1 Framework Programme 7

Agence Nationale des Technologies de l'Information et de la Communication, Cameroon (ANTIC) is a beneficiary under the IST-Africa[14] Initiative since 2009. The Ministry of Scientific Research and Innovation was a beneficiary under CAAST-Net[15] (2008 – 2012).

Participation in IST-Africa facilitated ANTIC to host an IST-Africa FP7 Training Workshop in Yaoundé in 21 March 2011 focused on FP7-ICT-Call 8 - 9 Calls for Proposals and undertake a consultation with the research community to map expertise.

Cameroon secured participation in **25** projects in FP7 and secured research funding of over **€3.8 million**. This is broken down thematically into ICT (4 projects), INCO (1 project), Environment (4 projects), Health (7 projects), Infrastructures (1 project), KBBE (2 projects), NMP (1 project), People (1 project), Science Society (1 project), Space (1 project) and SSH (2 projects).

4.2.1.2 Horizon 2020

As part of its ongoing IST-Africa activities ANTIC circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has undertaken an initial mapping of research capacity. ANTIC actively encouraged stakeholders to engage with the ICT-39-2015 and ICT-39-2017 Calls. ANTIC hosted an IST-Africa Horizon 2020 Workshop focused on ICT-39-2017 in Yaoundé in December 2016.

Up to September 2018, Cameroon has secured 7 Horizon 2020 projects with research funding of over €702,000, across a number of thematic areas:

➤ LEIT - ICT-39-2015 - **DMC-MALVEC** (RIA - Research and Innovation Action) - Organisation de Coordination pour la Lutte Contre les Endémies en Afrique Centrale

➤ ERC-2015-CoG - **OurMythicalChildhood** (Universite de Yaounde I)

➤ H2020-MG-2016-SingleStage-RTD-MOVE - **SaferAfrica** (CSA - Coordination & support action) - Ecole Nationale Superieure des Travaux Publics

➤ H2020-ICT-2016-INT - **IST-Africa 2016-2018** - Agence Nationale des Technologies de l'Information et de la Communication

➤ H2020-SFS-2016-1 - **LEAP-AGRI** (ERA-NET-Cofund) - Ministry of Scientific Research and Innovation

➤ H2020-SFS-2016-2 - **BREEDCAFS** (RIA) - Institut De Recherche Agricole pour le Developpement

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[14] http://www.ist-africa.org

[15] www.caast-net.org/

➢ H2020-MSCA-RISE-2016 - **SLAFNET** (MSCA-RISE) - Universite de Yaoundé I

4.2.2 Germany (GIZ and KfW)

The German Development Service (DED), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) and the KfW Development Bank are the three pillars of German development cooperation in Cameroon. According to Cameroon's Ministry of Economic Affairs, Planning and Regional Development, on March 01, 2010, two cooperation agreements (one concerning technical cooperation, the other concerning financial cooperation) amounting to a total of 49 million euros were signed between the Government of the Federal Republic of Germany and the Government of the Republic of Cameroon.

Technical cooperation is provided by the Federal Republic of Germany through its Agency for Technical Cooperation (GIZ) in terms of promoting programs related to Health, Environment, decentralisation and advisory services on implementing the Paris Declaration.

In relation to research, bilateral cooperation between Cameroon and Germany led to a project for the creation of a social and scientific research centre in Yaoundé in 2011. The project was financed by the Thyssen Foundation and was estimated to cost over FCFA 80 million (121,959.21 EUR).

5. EGYPT

5.1 Introduction

Egypt is situated in Northern Africa, bordering the Mediterranean Sea and sharing boundaries with Libya and the Gaza Strip. It has a surface area of 1,001,450 square km, made up of twenty-seven administrative divisions. The population is estimated at 99.41 million inhabitants (July 2018 CIA WorldFactBook) with literacy rate of 73.8%[16]. 62.35% of the total population is between 15 and 64 years of age. Cairo has a population of 20.076 million and Alexandria 5.086 million (2018). The official languages are Arabic, with English, French and German widely used within the education systems.

The Egyptian Government has significantly invested in capacity building, digital literacy and certification of skills, with over 126 IT Houses and 2,163 IT Clubs in operation around the country. The ICT Policy (2013 – 2017) focused on achieving sustainable socio-economic development with key ICT sectors identified to include Digital Identity, Egypt Digital Hub, Basic Infrastructure (Broadband, Cloud Computing, Submarine Cables), Cyber Security & eSignature, Information Infrastructure & Digital Content, Electronics Design & Manufacturing, Legislative and Policies Framework. SDS (Sustainable Development Strategy): Egypt's Vision 2030[17] pays specific attention to enhancing scientific research, upgrading the technological capabilities, encouraging innovation and increasing R&D spending as they represent the core for the sustainable development of the country. There is good eInfrastructure with links to three submarine cables, a national backbone and national Internet Exchange Point (IXP) in place. ICT Initiatives are focused on eLearning, eHealth, eGovernment, eContent, Community Integration and ICT for people with disabilities; Broadband Access Network and Internet of Things. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

In relation to Communications, according to MCIT and NTRA published statistics, there were 7067 million fixed line subscribers (7.63% penetration) and 96.36 million mobile subscribers (105.16% penetration) as at July 2018. There were 33.15 million mobile Internet subscriptions, 3.44 million USB modem subscribers and 5.99 ADSL subscribers as at July 2018.

Egypt has a vibrant research community and strong experience in collaborative research with 29 public Universities, 43 private Universities and more than 400 private Higher Education Institutions.

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[16] CIA World Factbook
[17] http://sdsegypt2030.com/?lang=en

5.2   Bilateral & Multilateral Cooperation

Egypt has strong bilateral relationships with a number of EU Member States, including Finland, Spain, Germany and Italy. Discussions are ongoing with Poland, Sweden, Ireland and France. Egypt receives funding under Horizon 2020, the European Neighbourhood and Partnership Instrument (ENPI) and Erasmus Mundus Programme.

Egypt has been actively engaging with Nile basin countries and other African Member States to share experiences and provide ICT-related training. Engineers from Sudan, Eriteria and Burundi have been trained in Egypt. MCIT has signed Letters of Intent with Uganda, Ethiopia and South Africa outlining specific areas for ICT-related cooperation. There is cooperation between Egypt and Nigeria in relation to implementing fibre optics. A Cultural heritage project has been funded by MICT in the Democratic Republic of Congo. Discussions are ongoing with Kenya, Rwanda, Tanzania and South Sudan.

5.2.1   European Commission

Under the European Neighbourhood and Partnership Instrument[18] (ENPI), €558 million was allocated from 2007 – 2010 and €440.29 million from 2011 - 2013 focused on political reform and good governance; competitiveness and productivity of the economy; and socio-economic sustainability of the development process.

Under the European Neighbourhood Instrument (ENI) €756 - 924 million was allocated from 2014 - 2020 focused on Poverty alleviation, Local Socio-Economic Development and Social Protection; Governance, Transparency and Business Environment; Quality of Life and Environment.

Egypt also benefits from the Erasmus Mundus Programme, which supports mobility and co-operation with the EU in Higher Education.

Through ASREN and the Egypt Universities Network (EUN), Egypt is a beneficiary of the AfricaConnect 2 eInfrastructure project co-funded by DG DEVCO.

5.2.1.1   Framework Programme 7

Egypt is a beneficiary under the IST-Africa Initiative since 2009 (Ministry of Communication and Information Technology, ITIDA). As part of its ongoing IST-Africa activities MCIT / ITIDA circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has undertaken an initial mapping of research capacity. MCIT hosted an IST-Africa Horizon 2020 Workshop in Cairo on 10 February 2014.

Egypt secured participation in **101** FP7 projects with research funding of over **€16 million** across the following themes: ICT (12 projects), Energy (4 projects), Environment (12 projects), Health (7 projects), INCO (18 projects), Space (3 projects), Social Sciences (8 projects), Transport (2

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[18] http://ec.europa.eu/europeaid/where/neighbourhood/country-cooperation/egypt/egypt_en.htm

projects), Infrastructure (4 projects), NMP (1 project), People (6 projects), Science in Society (2 projects), Food Agriculture and Biotechnology (KBBE) (18 projects), Research Potential (3 projects) and Security (1 project)

5.2.1.2 Horizon 2020

Up to September 2018, Egypt is involved in **34** Horizon 2020 projects with research funding of over €3.475 million across a number of thematic areas:

➢ LEIT-SPACE H2020-Galileo-2014-1 - **BEYOND** (CSA - Coordination & support action) - Arab Institute of Navigation

➢ SOCIETY, H2020-INT-INCO-2014 - **MERID** (CSA - Coordination & support action) - Ministry of Higher Education and Scientific Research)

➢ MSCA-SUPPORT, H2020-MSCA-NCP-2014 - **Net4Mobility** (CSA - Coordination & support action) - Academy of Scientific Research and Technology ASRT

➢ Science with and for Society, H2020-GARRI-NCP-2014-1 - **SiS.net2** (CSA - Coordination & support action) - Academy of Scientific Research and Technology ASRT

➢ INFRA, H2020-EINFRA-2015-1 **- VI-SEEM** (RIA - Research and Innovation action) - Bibliotheca Alexandrina Library of Alexandria Bibalex

➢ H2020-SC5-2015-one-stage - **GEO-CRADLE** (CSA - Coordination & support action) - Centre for Environment and Development for the Arab Region and Europe

➢ H2020-INT-SOCIETY-2015: **FEUTURE** (RIA - Research and Innovation action) - The American University in Cairo);

➢ H2020-INT-SOCIETY-2015 **MedReset** (RIA)- Cairo University

➢ H2020-SFS-2015-2 - **IMAGE** (RIA - Research and Innovation action) - The Agricultural Research Center

➢ H2020-WATER-2015-one-stage - **WaterWorks2015** (ERA-NET-Cofund) - Academy of Scientific Research and Technology Asrt

➢ H2020-ISIB-2015-2 - **SIMRA** (RIA - Research and Innovation action) - Cairo University

➢ H2020-WATER-2015-two-stage - **MADFORWATER** (RIA - Research and Innovation action) - Ministry of Water Resources and Irrigation

➢ H2020-INT-INCO-2015 - **5TOI_4EWAS** (CSA - Coordination & support action) - Academy of Scientific Research and Technology Asrt; National Research Center)

➢ H2020-SC5-2016-OneStageA - **4PRIMA** (CSA - Coordination & support action) - Ministry of Higher Education and Scientific Research

➢ H2020-ICT-2016-INT - **IST-Africa 2016-2018** (CSA - Coordination & support action) - Information Technology Industry Development Agency)

➢ H2020-SFS-2016-1 - **LEAP-AGRI** (ERA-NET-Cofund) - Ministry of Higher Education and Scientific Research)

- H2020-SFS-2016-2 - **MedAID** (RIA - Research and Innovation action) - National Institute of Oceanography and Fisheries
- H2020-MSCA-RISE-2014 - **CLUSDEV MED** (MSCA-RISE) - Academy of Scientific Research and Technology Asrt
- H2020-MSCA-RISE-2014 - **ECOFISH** (MSCA-RISE) - The Agricultural Research Center and Kafr El-Sheikh University
- H2020-MSCA-RISE-2014 - **NonMinimalHiggs** (MSCA-RISE) - Zewail City of Science & Technology
- H2020-MSCA-RISE-2014 - **GLYCANC** (MSCA-RISE) - Cairo University
- H2020-MSCA-RISE-2015 - **OptArch** (MSCA-RISE) - Cairo University
- H2020-MSCA-RISE-2015 - **TACTILENet** (MSCA-RISE) - Nile University
- H2020-MSCA-RISE-2016 - **trans-making** (MSCA-RISE) - Cairo Lab for Urban Studies Training & Environmental Research Cluster
- H2020-BG-2016-2 - **ODYSSEA** (RIA) - Arab Network for Environment & Development
- H2020-MSCA-RISE-2016 - **CURE-XF** (MSCA-RISE)The Agricultural Research Center
- H2020-SFS-2017-1 **- ForestValue** (ERA-NET-Cofund) - Academy of Scientific Research and Technology Asrt
- H2020-SC5-2017-OneStageB - **WaterWorks2017** (ERA-NET-Cofund) - Academy of Scientific Research and Technology Asrt
- H2020-MSCA-RISE-2017 - **DiCoMI** (MSCA-RISE) - Central Metallurgical Research and Development Institute
- H2020-MSCA-NCP-2017 - **Net4MobilityPlus** (CSA) - Academy of Scientific Research and Technology Asrt
- H2020-RUR-2017-2 **- NEXTFOOD** (RIA) - Sekem Development Foundation - Sdf
- H2020-CIRC-2017TwoStage - **HYDROUSA** (IA) - Heliopolis University Association and Isis For Food Industries, Ltd
- H2020-MSCA-RISE-2015 - **InvisiblesPlus** (MSCA-RISE) Zewail City of Science & Technology
- H2020-SFS-2018-1 - **LEAP4FNSSA** (CSA) - Zewail City of Science & Technology

5.2.1.3   Erasmus+

Egyptian universities have established agreements and MoUs with universities in the EU under the Erasmus+ framework, and in particular under the International Credit Mobility (ICM) program. ICM program supports the mobility of students, staff, and faculty members employed in higher education institutes (HEI) in Egypt to travel to universities in EU. The mobility ranges from one week (staff and faculty members) to a full semester and beyond for B.Sc., M.Sc. and Ph.D. students. According to the latest newsletters issued by the National Erasmus+ office of Egypt (NEO), the number of

mobilities implemented in 2018 exceeds 800 individuals from Egypt to Europe and around 450 individual mobilities from Europe to Egypt.

5.2.1.4   PRIMA

Partnership for Research and Innovation in the Mediterranean Area (PRIMA)[19] is a joint funding programme to support Euro-Mediterranean cooperation in research and innovation. It aims to contribute to United Nations' Agenda 2030 through the achievement of the Sustainable Development Goals (SDGs).

PRIMA consists of EU Member States, Horizon 2020 Associated Countries and Mediterranean Partner Countries on an equal footing basis (co-ownership, co-management and co-funding) with the Participation of the European Commission, under the framework of an art.185 TFEU.

The partnership is financed through a combination of funding from PRIMA Participating States (currently €274 million), and a €220 million contribution from the EU through Horizon 2020. Currently, more than 19 countries have committed officially to the initiative including: Egypt, Cyprus, Egypt, France, Germany, Greece, Italy, Luxembourg, Portugal, and Spain.

The key thematic area focus of PRIMA are:

1.   Integrated and sustainable management of water for arid and semi-arid Mediterranean areas
2.   Sustainable Mediterranean agro-food value chain for regional and local development.
3.   Sustainable farming systems under Mediterranean environmental constraints

5.2.1.5   EumedConnect: NReNs interconnection to GEANT

EumedConnect: NReNs interconnection to GEANT project[20] builds on the previous phase of EUMEDCONNECT, which was originally launched in 2004 to develop an inclusive Information Society in the Mediterranean partner countries. It is focused on linking Mediterranean and European partners via GEANT to provide high-capacity Internet connectivity for academic and scientific collaborations.

Countries involved: Mediterranean Partner countries, including Morocco, Algeria, Tunisia, Egypt

Main partner: DANTE

Partner in Egypt: EUN – Egyptian Universities Network

Funding: 4M€ from ENPI (European Neighbourhood and Partnership Instrument) 2009-2011

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[19] http://prima-med.org/
[20] http://www.eumedconnect2.net/server/show/nav.2167

5.2.1.6 NATP (New Approach to Telecommunications Policy): Support to Regulatory Reforms and Harmonization in the Mediterranean Region

THE NATP projects have focused on facilitating the creation of a harmonised and investment friendly environment in the electronic communication sector. NAPT-3 builds on the work undertaken in NATP-1 in relation to policy goals and creating awareness of the benefits of liberalising the telecommunications industry and NATP-2 which focused on regulatory reform. NATP-3 is focused on exploiting international cooperation between national regulatory authorities.

Countries involved: Mediterranean Partner Countries including North Africa (Morocco, Algeria, Libya, Tunisia, Egypt)

Main partner: EMERG (Euro-Mediterranean Group of Electronic Communications Regulators)

Funding: 1M€ from ENPI (European Neighbourhood Policy Instrument) 2009-2011

5.2.2 Italy

Egypt has had two projects with Italy: Italian Debt for Development Swap Program and Twinning Project with Italian Regulator, AGCOM.

5.2.2.1 Italian Debt for Development Swap Program

The first phase of the Italian Debt Swap Program was signed in 2001 with funding of $149.09 million from 2001 - 2007 to finance 53 projects through government entities and NGO in the following fields: Smart School Network, Mobile IT Club, ICT for Illiteracy Eradication, Community Development Portal and Community Development Generation.

In 2007 Egypt and Italy signed the second tranche of the debt for development swap agreement with a total of $100 million to finance projects in ICT, Environment, Poverty alleviation, Youth and Children, Health Sector and Gender and for a period of 5 years (2007-2011) and which including the following fields in the ICT area: Technical education, Small and Medium Enterprises and Modernizing Industrial Schools using Information and Communication Technologies- ICT for SMEs.

The total budget allocated to ICT under phase two was $4 million with 50% contribution from Italian Cooperation and 50% contribution from MCIT.

5.2.2.2 Twinning Project with AGCOM

MCIT through the National Telecommunication Authority (NTRA) had a twinning project with AGCOM, Italy & BNETZA, Germany (Junior Partner) from November 2008 until April 2011. Twinning with European regulators was part of the policy to empower the telecommunications sector through continued liberalization, ensuring that all stakeholders (citizens, government, operators and vendors) benefit throughout the process.

5.2.3   France

MCIT signed a Memorandum of Understanding with the French Ministry of Industry on 28th September 2003 in Cairo. The Memorandum of Understanding included the following areas of cooperation: eGovernment; Development of Digital economy; Regulation; Evolution of Postal Services; Encouraging and supporting partnerships between SMEs; Training and education; Development of IT –oriented technology parks and Multilateral issues (ITU, UPU etc). An action plan was signed with the French Ministry of Industry on 16th November 2005 focused on: Benchmarking on public policies and national strategies towards the development of knowledge based information society; Exchanges of best practices on postal and ICT regulation; E-commerce, electronic signature and security of electronic transactions; Smart cards in e-business and e-signature applications; Collaboration between software park and clusters and International issues, including the follow- up and implementation of the World summit on the Information Society (WSIS).

In addition, a number of MoUs were signed during the Ministerial visit to France to participate in the Franco-Egyptian Presidential Council (CPAFE) meeting in 2007 between the Egyptian and the French Organizations in the ICT field:

- MoU between Sophia Antipolis Technology Park, ITIDA and the Smart Village company;
- MoU between Groupe La Poste (the French Post Organization) and the Egyptian National Post Organization (ENPO);
- ITIDA signed an MoU with IBM on training and human development and with Orange on establishing a technology innovation center in the Smart Village to be specialized in technology R&D; and
- Telecom Egypt signed a contract with Alcatel- Lucent.

5.2.3.1   Twining project between Egypt and France

A Twinning agreement was signed between Egypt Post and French La Poste on 26th February 2007 to implement the Action for the Establishment of a Modern Postal Management for the Egyptian National Postal Organization [ENPO].

5.2.4   Finland

The Egypt-Finland Business Council was established in February 2014 to support coordination between Egyptian and Finnish companies and exchange of experience among its members on best practices and common challenges in order to strengthen cooperation ties and trade relations between the two sides in different fields.

5.2.5   Poland

Cooperation discussions are ongoing with Poland in relation to developing broadband internet, roaming, developing mobile internet quality, ICT security, capacity building, e-applications and

SMEs. A Memorandum of Understanding was signed with the National Regulatory Authority of Egypt in relation to CERT.

5.2.6 Spain

On 30th June 2016, Egypt represented by Science and Technology Development Fund (STDF) and Spain represented by the Centre for the Development of Industrial Technology, E.P.E. (CDTI) signed the Egyptian-Spanish Innovation Programme (ESIP) for technological co-operation.

Its objective is to promote and fund market-driven research and technology development, as well as to encourage partnerships and business-led research. Each country agreed to fund its participants. Areas of cooperation for ESIP focuses on:

1. Agriculture and Sustainable Food Production
2. Sustainable water management
3. Affordable & Inclusive Healthcare
4. Renewable Energy
5. Environment sector
6. Construction
7. Transportation sector
8. Tourism and Antiquities sector
9. Strategic Industries sector

5.2.7 Sweden

Egypt has been keen on establishing close ties with the Swedish ICT sector due to its vast experience. Both countries organized several events together to discuss topics of mutual interests, particularly smart and sustainable cities. A Swedish-Egyptian ICT Forum was held in 2014 with a main goal to get acquainted with investment opportunities in Egypt. The Forum was meant to open communication channels between Swedish companies and Egyptian government entities and local companies.

5.2.8 Belarus

Egypt is keen to establish close ties with the Belarusian ICT sector, since Belarus enjoys competitive advantages in various fields within this sector. Belarus is one of the distinguished destinations in outsourcing services and possesses considerable experience in this area since 2009. This is in addition to other areas such as cybersecurity, electronics manufacturing and designing, especially the semiconductor industry, as well as the technology education.

5.2.9 Russia

The Ministry of Communications and Information Technology (MCIT) has been participating at the Russian- Egyptian Joint Committee since November 2005.

6.   ETHIOPIA

6.1 Introduction

Ethiopia is situated in Eastern Africa and shares boundaries with Somalia, Kenya, South Sudan, Sudan, Eritrea and Djibouti. It has a surface area of 1,104,300 square kilometres and is a federal state with nine regional states and two city administrations. Its population is estimated at 108.39 million inhabitants (July 2018, CIA World Fact Book) with a literacy rate of 49.1%. Ethiopia is Africa's oldest independent country and its second largest in terms of population. Almost 54% of the total population is between 15 - 64 years of age. Addis Ababa, the capital city, has a population of 4.4 million (2018 CIA World Factbook). Although Amharic is the official language of Ethiopia; English and Arabic are widely spoken.

There is a good Policy Framework in place with the ICT Policy and Strategy (2009), National Science, Technology and Innovation (STI) Policy (2012) and ICTs in Education Implementation Strategy and Action Plan (2010). eInfrastructure is rapidly improving with 12,000 kms of optic fibre cable radiating from central Ethiopia across the country and connecting all cities, with the capacity to transmit 40 Gbps along with the national backbone. MCIT has established 300 Community Information Centres and 12 community radio stations across the country to provide information on new ICT technology transfer and implementations, healthcare, agricultural information and education issues. ICT Initiatives are primarily focused on eGovernment and Public Key Infrastructure (PKI), eInfrastructure including EthERNet (Ethiopian Education and Research Network), Entrepreneurship and eEducation. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

According to Ethio Telecom as at November 2018, there are 1.23 million fixed telephone lines in use, 65.7 million mobile phone users and 17.87 million Internet and data users with 85% wireless coverage across Ethiopia

There is a Government call centre that citizens can ring via a toll free number and discuss their queries in relation to Government Ministries and Departments. The framework for the National Public Key Infrastructure (PKI) is completed and has now moved into the implementation phase.

Ethiopia has a good research base and experience in collaborative research with 45 public Universities and 45 private Higher Education Institutions.

6.2 Bilateral & Multilateral Cooperation

Bilateral support for ICT related activities is primarily from European Commission (FP7, H2020, EDF10, EDF11), the VLIR-IUC Belgian Programme, German Federal Ministry for Economic Cooperation and Development (Entrepreneurship project between Arba Minch University and Neu-Ulm University of Applied Sciences, Germany), Bern University in Switzerland, Republic of South Korea and United States.

6.2.1 European Commission

Under EDF10 (2008 – 2013), 689 million euro was allocated with the focal areas including Transport and Regional Integration, Rural Development and Food Security, Macro-economic Support and Governance. ICT was leveraged in three projects under EDF10.

Under EDF11 (2014 - 2020) Ethiopia is allocated €745 million with focal areas including Sustainable Agriculture and Food Security, Health, Roads (Phasing out) and Energy (Phasing in), Civil Society and Synergetic Governance, Support Measures. Quite a lot of ICT-related activities are embedded in the Transformation Triggering Facility (TTF) programme being undertaken under EDF11.

Through UbuntuNet Alliance and the Ethiopian Research and Educational Network (EthERNet), Ethiopia is a beneficiary of the AfricaConnect and AfricaConnect 2 eInfrastructure project co-funded under EDF10 and EDF11.

Ethiopia leveraged ICT as a horizontal enabler in sectoral projects during EDF10 and continues to embed ICT within EDF11 programs as outlined in Table 3 below provided by the National Authorising Authority:

Table 3: ICT-related Projects funded under EDF10 & EDF11 in Ethiopia

No	Program	Project Activity	ICT Budget EURO	Notes
1.	Agricultural Marketing	Acquisition of ICT equipment and establishment of market information system for Ethiopian Commodity Exchange (ECX)	€4 million	EDF10 project - total funding €10 million, Closing
2.	Trade Enhancement Facilitation Project	Market Networking by Ministry of Trade	€5 million	EDF 10 project, Ongoing
	National quality infrastructure (Ministry of Science and Technology)	Quality and Standards Development including ICT Research Support	€6 million	EDF10 Project. finished
4.	Transformation Triggering Facility (TTF)	4.1 Business school • Online courses (eLearning)· • Offline course delivering 4.1.1 Business innovation center • Development of ICT infrastructure 4.2. One stop shopping system for SME (Ministry of Industry)	€35 million	EDF11 Activity - ongoing

6.2.1.1 Framework Programme 7

The Ministry of Science and Technology (MoST) and the Ministry of Communications and Information Technology are beneficiaries under IST-Africa since 2011. Participation in IST-Africa facilitated MCIT to host an IST-Africa Stakeholder Meeting in Addis Ababa on 05 December 2013 to undertake a consultation with the research community to map expertise.

Ethiopia secured participation in **23** projects in FP7 with research funding in the region of **€3.66 million** as well as funding secured by 24 individual researchers through Marie Curie Actions. This is broken down thematically into: ICT (2 projects), Environment (8 projects), Health (5 projects), KBBE (3 projects), Space (2 projects) and SSH (3 projects).

6.2.1.2 Horizon 2020

As part of its ongoing IST-Africa activities MCIT circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has undertaken an initial mapping of research capacity. MICT has established a National Contact Point for ICT for Horizon 2020, which has also increased visibility of Ethiopian research institutions. MCIT hosted IST-Africa Horizon 2020 Workshops in Addis on 05 December 2013; 17 November 2014 (focused on ICT-39-2015) and 21 November 2016 (focused on ICT-39-2017).

Up to September 2018, Ethiopian organisations have secured participation in 20 Horizon 2020 projects with research funding in excess of €2.278 million across a range of thematic areas:

➢ SOCIETY, H2020-INT-INCO-2014 - **RINEA** (CSA - Coordination & support action) - African Union

➢ ICT-39-2015: **mHealth4Afrika** (RIA - Research and Innovation Action) - University of Gondar; **DMC-MALVEC** (RIA - Research and Innovation Action) - Jimma University; **its4land** (RIA - Research and Innovation Action) - Bahir Dar University

➢ H2020-ICT-2016-INT - **IST-Africa 2016 - 2018** (RIA - Research and Innovation Action) - Ministry of Communication and Information Technology

➢ H2020-WATER-2015: **WATERSPOUTT** (RIA - Research and Innovation Action) - Mekelle University); **FLOWERED** (RIA - Research and Innovation Action) - Addis Ababa University; Geomatrix Plc)

➢ ERC-2015-AdG - **BM** - Addis Ababa University

➢ H2020-MSCA-ITN-2014 - **EUROLEISH-NET** (MSCA-ITN-ETN) - University of Gondar

➢ H2020-MSCA-RISE-2014 - **DiasporaLink**(MSCA-RISE) - Addis Ababa University

➢ H2020-MSCA-RISE-2014 **- IMIXSED** (MSCA-RISE) - Jimma University

➢ H2020-WATER-2015-two-stage **- DAFNE** (RIA) - Water and Land Resource Center

➢ H2020-SFS-2016-2 - **InnovAfrica** (RIA) - Haramaya University

- H2020-SFS-2016-2 - **MUSA**(RIA) - Southern Nations, Nationalities and Peoples Regional Agricultural Research Institute

- H2020-MSCA-RISE-2016 - **SLAFNET** (MSCA-RISE) - Addis Ababa University

- H2020-SFS-2017-1 - **AfriCultuReS** (RIA) - Geosas Consulting Service Plc

- H2020-MSCA-RISE-2017 - **BRTE**(MSCA-RISE) - Wolaita Sodo University

- H2020-ICT-2017-1 (ICT-39-2017) - **SAMS**(IA) - Oromiya Agricultural Research Institute and Iceaddis It Consultancy Plc

- H2020-RUR-2017-2 - **NEXTFOOD** (RIA) - Mekelle University

- H2020-SFS-2018-1 - **LEAP4FNSSA** (CSA) - African Union

6.2.2 Belgium

The VLIR-IUC programme aims at building the institutional capacity of a selected number of universities in the South. The IUC-JU Institutional University Cooperation project is a collaboration between Jimma University and the different Flemish universities under the umbrella of the Flemish Interuniversity Council (VLIR-UOS). The IUC-JU project focuses on the impact of the Gilgel Gibe hydro-electric dam in terms of human and animal health, ecology and agronomy. Joint research is undertaken in different disciplines in the Gilgel Gibe area to improve the quality of life of communities. Furthermore, it is envisaged that the research and educational capacities of Jimma University academic staff will be extended.

Main Partners: Jimma University, VLIR

Funding: VLIR

6.2.3 Germany

Arba Minch University has recently forged a fruitful alliance with the Neu-Ulm University of Applied Sciences, Germany (HNU) and signed a Memorandum of Understanding (MoU) for the joint project, 'Applied Entrepreneurship Education Program' (AEEP), in Neu-Ulm, Germany on October 18, 2013.

This project is a three-year capacity building project that will run until 2016. The main aim of this project is to harness and promote entrepreneurial aspirations amongst Electrical Engineering students in AMU and its staff.

Main Partners: Arba Minch University, Neu-Ulm University of Applied Sciences Germany (HNU), German Federal Ministry for Economic Cooperation and Development (BMZ), DAAD

Funding: German Federal Ministry for Economic Cooperation and Development (BMZ)

6.2.4 Switzerland

Hawassa University has signed a Memorandum of Understanding with Bern University of Switzerland to work on the Young entrepreneur Exchange Project (YEEP).

The purpose of the YEEP project partnership is to

- Mobilize young Ethiopians and Swiss with innovative business ideas
- Develop an entrepreneurial culture in all areas of study (teaching/learning) at both institutions
- Support project participants in developing their own business ideas
- Encourage and support new start-ups through an entrepreneurial network
- Provide opportunities for intercultural learning and capacity building

Main Partners: Hawassa University, Bern University

Funding: Bern University of Switzerland through fund raising

6.2.5   South Korea

The Republic of South Korea is providing support through different bilateral cooperation projects including the establishment of the Information Access Centre and an advisory service for projects on the e-office service and the Government Integrated Data System project.

The South Korean National Information Society Agency (NIA) and MCIT signed an agreement for the establishment of Information access center in Addis Ababa, which will serve the community by providing access to the Internet and information sources. The Ministry of Science and Technology was selected to host the center, which has been inaugurated and commenced activities.

Main Partners: Ministry of Science and Technology, Ministry of Communication and Information Technology

Funding: 300,000 USD, project commenced in December 2013

6.2.6   United States of America

Jimma University collaborated with the School of Public Health and Tropical Medicine at Tulane University (USA), the Federal Ministry of Health (Ethiopia), Centers for Disease Control and Prevention (CDC) and the National School of Public Health (ENSP/Fiocruz, Brazil) on a MSc in Health Monitoring and Evaluation to assist in building capacity in the Ethiopian health system.

The Masters in Health Monitoring and Evaluation started in February 2006 in the Department of Health Services Management in Jimma University. To date, a total of 130 students have graduated in four cohorts of postgraduate training in Health Monitoring and Evaluation of which 11 (8.5%) are international students from different African Countries.

The program has evolved as a center of excellence in the field under the College of Public Health and Medical Sciences with wider range of services including the MSc level training in Health M&E, researches on evaluation, short term trainings in M&E and consultancy services for evaluation clients.

Currently, ICME – JU has enrolled fifth cohort trainees composed of both national and international different departments in Jimma University, Tulane University (New Orleans, USA), National School

of Public Health (ENSP/Fiocruz, Rio de Janeiro, Brazil) and other Ethiopian and US Based Universities to offer standard training in Program Evaluation applied to Public Health.

Main Partners: Jimma University, Tulane University, Federal Ministry of Health, Center for Disease Control and Prevention and National School of Public Health (ENSP/Fiocruz, Brazil)

7.   KENYA

7.1   Introduction

Kenya is situated in East Africa, bordering the Indian Ocean and sharing boundaries with Tanzania, Uganda, South Sudan, Ethiopia and Somalia. It has a surface area of 580,367 square km, made up of forty-seven (47) counties. The population as at July 2018 was estimated at 48,397 million inhabitants with a literacy rate of 78% (CIA World Factbook). 57.88 percent of the population is between 15 and 64 years of age. Nairobi, the capital city, has a population of 4.386 million (2018 - CIA World Factbook). The official languages are English and Kiswahili.

There is a good Policy Framework in place including eGovernment Strategy, Kenya ICT National Master Plan 2017, Kenya Science, Technology and Innovation (STI) Policy 2012, Cyber Security Strategy (2014), National Broadband Strategy, Access to Information Act (2016) and Vision 2030. There is good eInfrastructure with a national fibre optic infrastructure and links to four submarine cables. KENET is the 2nd largest NREN in Africa supporting 240 campuses and managing the largest IP network in Kenya. ICT Initiatives are focused on eEducation & eSkills, Digital Inclusion, Business Process Outsourcing, Local Content, Information Security and eGovernment. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

According to Communication Authority of Kenya statistics, mobile penetration is at 97.1% as at June 2018, with 45.5 million subscriptions compared with 44.1 million in March 2018 mobile penetration of 97.8 percent. Fixed lines have continued to decrease from 23,314 in March 2018 to 23,099 in June 2018. Internet subscriptions at 41.1 million in June 2018

Kenya has a vibrant research community and strong experience in collaborative research with 31 fully chartered Public Universities, 6 public University Constituent Colleges, 6 public research institutes, 18 accredited private Universities, 14 private Universities with letter of interim authority and 5 private University Colleges.

7.2   Bilateral & Multilateral Cooperation

Kenya has sectoral bilateral cooperation agreements in relation to Science Technology and Innovation/ICT in place with France (through IRD, IFRA and CIRAD), United Kingdom (through the British Council-Newton Fund), Spain, Netherlands, Germany, Norway, Finland and Sweden. Kenyan organisations are also beneficiaries in a number of FP7 and H2020 co-funded research projects and ACP co-funded projects.

The table below presents current collaborations with EU Member States and European institutions.

COLLABORATIONS	LEAD MINISTRY	STATUS	THEME	COMMENT
France (IRD, IFRA, CIRAD)	MoEST	Signed: June 2009 and reviewed 2015	Multi thematic	78 research programmes have been undertaken in cooperation with Kenyan Universities 114 Kenya researchers or students received scholarships (Batchelors, Masters, PhD)
British Council (AKTP)	MoEST	Signed, November 2009	Technology Transfer, Private Partnerships	Co-hosted Africa Knowledge transfer partnerships in February 2009
Kenya –UK (Newton Fund)	MOEST/NRF	2016	Collaborative Activities	Support of Research and Innovation Capacity under a Joint Programme Known as the UK-Kenya Newton Fund
IAEA	National Council for Science and Technology (NCST)	Ongoing	Atomic Energy	
Italy (San Marco)	MoEST	Signed March, 1995; Expired March, 2010: Review in progress	Space Science	San Marco satellite Tracking and Launching Station was established in Malindi, Kenya. Both Kenya and Italy Governments have exchanged their respective draft copies of renewal agreements and are waiting a negotiation date in order to agree one document for signature.
Germany	MoEST	Under negotiation	Multi thematic	Existing cooperation on training of scientists in National priority sectors
Spain	MoEST	Signed		Cooperation in Technical, Industrial, Vocational and Entrepreneurial Training
Netherlands	Government of Kenya			Through the Nuffic Fellowship Programme (NFP)
University of Northampton (UK)	MoEST and Universities	Signed	eWaste Management	Agreement between MoEST, University of Northampton and several Universities on Implementation
EU development Agencies	DANIDA, DAAD, SIDA, DFID, GIZ		Research components in sectoral areas	Development aid to Kenya from the EU development agencies has focused on capacity building which involves graduate training (MSC/PhD) on related aspects of S&T

Other international programmes on Environment, climate change, agriculture and Forestry are funded through UNESCO, UNEP, UNDP and FAO regional offices based in Nairobi.

There is also direct institutional support to programmes in Universities and Research Institutes by European Union Members States.

ICT and Innovation related bilateral support is primarily from European Commission, Sweden (SPIDER Programme), Germany (ict@innovation Open Source Regional Project) and Netherlands (IICD). Kenya was a beneficiary in a number of ACP-ICT Capacity building projects

7.2.1 European Commission

Under EDF10 (2008 – 2013), €399.4 million was allocated with the focal areas including Transport Infrastructure, Agriculture and Rural Development, and Macroeconomic Support.

Under EDF11 (2014 - 2020) €435 million was allocated with focal areas including Food Security, Sustainable Infrastructure, Accountability of Public Institutions, and Support Measures.

Kenya secured participation in 69 FP7 projects with research funding of over €12.3 million. To date Kenya has 44 Horizon 2020 participations attracting over € 9.5 Million. Kenya was a beneficiary in a number of ACP-ICT Capacity building projects.

Through UbuntuNet Alliance and the Kenyan Research and Educational Network (KENET), Kenya is a beneficiary of the AfricaConnect and AfricaConnect 2 eInfrastructure projects co-funded under EDF10 and EDF11.

7.2.1.1 Framework Programme 7

The Ministry of Education Science and Technology (MoEST) is a beneficiary under the IST-Africa Initiative[21] since 2009. As part of its ongoing IST-Africa activities MoEST circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has undertaken an initial mapping of research capacity.

Kenya made good progress in raising awareness of capacity under FP7 and up to October 2015 has successfully secured participation in **69** projects with research funding of over **€ 12.3 million**. This is broken down thematically into: ICT (7 projects), INCO (3 projects), Environment (18 projects), ERC (2 project), Health (14 projects), Food, Agriculture and Biotechnology KBBE (13 projects), INFRA (3 projects), People (3 projects), Science in Society (2 projects), Space (2 projects), Social Sciences (1 project) and Transport (1 project).

7.2.1.1 Horizon 2020

Participation in IST-Africa facilitated MoEST to host a joint IST-Africa/CAAST-Net Horizon 2020 Workshop in Nairobi on 21 January 2014, which trained over 150 researchers. A second IST-Africa

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[21] http://www.ist-africa.org

H2020 Workshop focused specifically on ICT-39-2015 on 14 November 2014 and a third on 10th November 2016, focused on ICT-39-2017.

Up to September 2018, Kenyan organisations have secured participation in 44 Horizon 2020 projects with research funding in excess of €9.5 million across a number of thematic areas:

- ENV, H2020-SC5-2014-two-stage - **AfricanBioServices** (International Livestock Research Institute; Kenya Wildlife Service; Ministry of Environment and Mineral Resources)
- INFRA, H2020-INFRASUPP-2014-2 - **B3Africa** (International Livestock Research Institute)
- LEIT-ICT, H2020-ICT-2015 - **COMRADES** (I-Hub Limited)
- ENV,H2020-SC5-2014-two-stage - **ECOPOTENTIAL** (United Nations Environment Programme)
- TRANSPORT, H2020-MG-2014_TwoStages - **EMPOWER** (United Nations Human Settlements Programme)
- ENV, H2020-WASTE-2014-one-stage - **EWIT** (International Centre for Research in Sustainable Development Ent(ICRSD), Kisii County, Kisii University & Sellgelle International Consultancy Company Limited)
- ENV, H2020-WASTE-2014-two-stage - **REFRESH** (United Nations Environment Programme)
- Science with and for Society, H2020-GARRI-2014-1 - **TRUST** (Partners for Health and Development in Africa (PHDA)
- LEIT - ICT-39-2015 - **mHealth4Afrika** (Strathmore University); **its4land** (The Technical University of Kenya)
- H2020-SFS-2015-2 - **SALSA** (African Centre for Technology Studies; International Centre for Research in Agroforestry)
- H2020-WATER-2015-two-stage - **VicInAqua** (Ministry of Agriculture Livestock and Fisheries; Jomo Kenyatta University of Agriculture and Technology)
- H2020-DRS-2015 - **RESCCUE** (United Nations Human Settlements Programme)
- H2020-WATER-2015-two-stage - **FLOWERED** (University of Eldoret); **DAFNE** (African Collaborative Centre for Earth System Science (Access)
- H2020-SC5-2015-two-stage - **Ground Truth 2.0** (Trans-African Hydro-Meteorological Observatory; Upande Limited)
- H2020-GV-2016-RTD - **FUTURE-RADAR** (United Nations Human Settlements Programme)
- H2020-ICT-2016-INT - **IST-Africa 2016-2018** (Ministry of Education Science and Technology)
- H2020-INFRASUPP-2016-1 - **UBORA** (Kenyatta University)
- H2020-SFS-2016-1 - **LEAP-AGRI** (Ministry of Education Science and Technology)
- H2020-INFRASUPP-2016-1 - **SEACRIFOG** (International Livestock Research Institute)
- H2020-INFRAIA-2016-1 - **VetBioNet** (International Livestock Research Institute)
- H2020-SFS-2016-2 - **TRUE** (Kenya Forestry Research Institute)

- ERC-2014-STG **- INTERACT** (ERC-STG) - Translators Without Borders
- H2020-MSCA-RISE-2015 - **DEMOSTAF** (MSCA-RISE) - African Population & Health Research Centre Kenya
- H2020-MSCA-IF-2015 - **Tropical lichens** (MSCA-IF-GF) - National Museums of Kenya
- H2020-SFS-2016-2 - **DIVERSify** (RIA) - Kenya Forestry Research Institute
- H2020-SC5-2016-TwoStage - **H2020_Insurance** (IA) - Trans-African Hydro-Meteorological Observatory
- H2020-MSCA-RISE-2016 - **TICASS** (MSCA-RISE) - Pwani University College
- H2020-SFS-2016-2 **- InnovAfrica** (RIA) - International Livestock Research Institute; Kenya Agricultural Research Institute and Kenya National Farmer's Federation
- H2020-SFS-2016-2 - **MUSA** (RIA) - International Centre of Insect Physiology and Ecology Lbg and the Real Ipm Company (Kenya) Limited
- H2020-SFS-2016-2 **- PALE-Blu** (RIA) - International Livestock Research Institute
- H2020-MSCA-RISE-2016 - **SLAFNET** (MSCA-RISE) - Catholic University of Eastern Africa and National Museums of Kenya
- H2020-SFS-2017-1 - **AfriCultuReS** (RIA) - Locate It Limited
- H2020-MSCA-ITN-2017 - **ANTHUSIA** (MSCA-ITN-EJD) - British Institute in Eastern Africa; Kenya Medical Research Institute and University of Nairobi
- H2020-ICT-2017-1 **- EPICA** (IA) - African Virtual University and Maseno University
- H2020-ICT-2017-1 - **GO-GA** (IA) - Elimu Elearning Company Limited
- H2020-ICT-2017-1 **- ISOOKO** (IA) - Ushahidi Network
- H2020-SC5-2017-OneStageB - **TWIGA** (RIA) - Strathmore University and Trans-African Hydro-Meteorological Observatory
- H2020-EE-2017-CSA-PPI **- InvECAT** (CSA) - United Nations Environment Programme
- H2020-ICT-2017-1 - **WAZIHUB** (IA) - Strathmore University
- H2020-SFS-2017-2 - **Circular Agronomics**(RIA) - Eastern Africa Farmers' Federation Society
- H2020-SFS-2018-1 - **LEAP4FNSSA** (CSA) - Network of African Science Academies (Nasac)
- H2020-LC-SC3-2018-Joint-Actions-1 - **PRE-LEAP-RE**(CSA) - Strathmore University

7.2.1.3   TACIT[22]: Tackling Aids and Tuberculosis through Communication and Information Technologies

Target Countries: Southern and Eastern Africa, pilots in Kenya, Zambia, Uganda and Namibia

Main partner: International HIV/Aids Alliance

Funding: €960,000 from EDF9 (@CP-ICT capacity-building programme) 2009-2011

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[22] http://www.aidsalliance.org/newsdetails.aspx?id=242

7.2.1.4 Africa4All Parliamentary Initiative[23]

Through the IST-Africa Initiative, the Parliament of Kenya was included in the Africa4All Parliamentary Initiative, which was funded under the @CP-ICT Call.

Target Countries: Eastern and Southern Africa with pilots in Kenya, Tanzania, Uganda, Lesotho, Namibia

Main partner: Gov2u

Partner in Kenya: National Assembly of Kenya

Funding: €410,000 from EDF9 (@CP-ICT capacity-building programme) 2009-2011

7.2.1.5 Capacity-building programme and Community Development in Internet Governance and ICT Policy (ACP/EDF9)

A Programme focused on Capacity-building and Community Development in Internet Governance and ICT Policy[24] was funded under the ACP-ICT Call (ACP/EDF9). This project, which ran from 2009 – 2011 undertook online training courses on Internet Governance and ICT Strategy, provided training through workshops and policy immersion fellowships.

African Target Countries: Botswana, Burundi, Congo and Kenya

Main partner: Diplo Foundation

Partner in Kenya: The Multimedia University College of Kenya

Funding: 960k€ from EDF9 (@CP-ICT capacity-building programme) 2009-2011

7.2.1.6 Enhancing Energy Accessibility & Efficiency through Sustainable STI Support National Networks with a Regional Dimension in East Africa (ENRICH)

The overall aim of ENRICH project was to strengthen Science, Technology and Innovation (STI) co-operation in East African (EA) countries by promoting operational and effective management of research and innovation activities with a special focus on energy access and efficiency

Partners in Kenya: Ministry of Education Science and Technology, Moi University and African Virtual University

Main Partner: Alicante University of Spain

Funding: ACP-EU

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[23] http://www.africa4all-project.eu/
[24] http://www.diplomacy.edu/ACP/Programme/default.asp

7.2.2   Sweden

7.2.2.1 ICT4Public Accountability & Democratic Engagement in Uganda & Kenya[25]

This project is focused on supporting citizen engagement in relation to public services in Uganda and Kenya. An E-participation model leveraging MobileSMS-Radio-Internet technologies is to be tested in Nakuru County in Kenya with lessons learned from Uganda from ToroDev's previous Spider project. In Uganda it will scale up the use of the eParticipation model in 5 South Western districts and other 5 northern Uganda districts. It aims to support active citizen involvement on the status of government service delivery and public resources utilisation. It aims to support evidence/priority issue-based planning and budgeting processes for improved public service delivery. This project is expected to run from March 2016 to September 2018.

Main Partner: Toro Development Network

Funding: SPIDER Programme (Funded by SIDA)

7.2.2.2   Open access policy development in Kenya, Tanzania and Uganda to make more digital content available[26]

This project aims to continue supporting the 16 Universities previously involved in the "Open Access in East Africa" project leveraging the Open Access repositories, journals and existing infrastructure. EIFL will continue to work with the Universities and their senior management to put more policies focused on open access to research outputs in place. It will instigate institutional Open Access policy task forces, which can take responsibility for implementing Open Access policies, workshops, webinars and capacity building events. This project is expected to run from April 2016 to March 2018.

Main Partner: EIFL – Electronic Information for Libraries
Funding: SPIDER Programme (Funded by SIDA)

7.2.2.3 Empowering SHGs in Kenya and India through ICT for better education and alternative livelihood opportunities

The overall objective of this project was to empower Self Help Groups (SHGs) to identify viable livelihood opportunities in order to improve their socio-economic status whilst bringing the well being of the environment into the equation. ICTs provided an important tool in acquiring information and learning, but also to new market opportunities. ICT was introduced in parallel with education to illustrate how it can improve their every day situation. This project ran from March 2007 – February 2010.

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[25] https://spidercenter.org/project/ict4public-accountability-democratic-engagement/
[26] https://spidercenter.org/project/eifl_2016/

Main Partners: CORDIO East Africa - Costal Oceans Research and Development -Indian Ocean (Kenya); SDMRI -Suganthi Devadason Marine Research Institute (India); Nyköping Folkhögskola (Sweden)

Funding: SEK 2.500.000 through SPIDER Programme (Funded by SIDA)

7.2.2.4 Open access: knowledge sharing and sustainable scholarly communication in Kenya, Tanzania and Uganda

This project aimed to raise visability and accessiblity of research outputs in Kenya, Tanzania and Uganda using free and open source software for open repositories and open access journals in higher education and research institutions. It aimed to develop a sustainable network of open access champions and reinforce local capacity in the management of open access journals and repositories.

Main Partners: EIFL (Electronic Information for Libraries) in cooperation with *Kenya Library and Information Services Consortium and Medical Students' Associations of Kenya (MSAKE), The Network of African Science Academies (NASAC), National Council for Science and Technology, Directorate of Higher Education, Ministry of Education, Science and Technology Kenya*; Consortium for Tanzania Universities and Research Libraries and Ifakara Health Institute (IHI), Sokoine University of Agriculture (SUA), University of Dar es Salaam (UDSM), Muhimbili University of Health and Allied Sciences (MUHAS), Ministry of Health and Social Welfare (MoHSW) and Tanzania Commission for Science and Technologies (COSTECH); and Consortium of Uganda University Libraries (CUUL) and Inter-University Council for East Africa (IUCEA), National Council for Higher Education, National Information Technology Authority Uganda (NITA-U), Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), Research and Education Network of Uganda (RENU) and Uganda National Council for Science and Technology (UNCST)

Target Countries: Uganda, Kenya, Tanzania

Funding: 500,000 SEK from SPIDER, June 2013 - May 2014

7.2.2.5 M-Governance: Exploring conditions for successful Mobile Governance in Kenya

The project aimed to identify, describe and undertake an analysis of the conditions that can promote the use of mobile phones for increased citizen participation and successful delivery of government services in Kenya. Face-to-face interviews will also be conducted with government officials from the Ministry of Health, Agriculture, Water, and Education in order to understand the real potential for m-governance in these agencies.

Target Country: Kenya

Funding: 500,000 SEK from SPIDER, September 2011 – February 2013

7.2.2.6   Acceleration of ICTs in Human Rights and Democracy Project - Kenya

This project built on a previous project run by Kenya Human Rights Commission (KHRC's) and aimed to train grassroots community based human rights networks known as HURINETS with particular emphasis on mobile phone use, expand the project to five more HURINETS with capacity to implement the ICT4D project, Conduct community outreach on the use of ICTs in informal settlements where many violations occur and harness KHRC use of ICTs in human rights and democracy.

Target Country: Kenya

Funding: 500,000 SEK from SPIDER, July 2013 to October 2014

7.2.3   Germany

7.2.3.1 ict@innovation

ict@innovation[27] focused on building capacities in African Small and Medium sized ICT enterprises in relation to using Free and Open Source Software (FOSS) by spreading FOSS business models for enterprises in Africa, fostering FOSS certification and supporting innovative local FOSS applications for social and economic development.

Target Countries: Eastern and Southern Africa (Kenya, Malawi, Mozambique, Rwanda, South Africa, Tanzania, Uganda, Ethiopia, Namibia, Zambia)

Main partners: Partnership of FOSSFA (Free Software and Open Source Foundation for Africa) and InWEnt - Capacity Building International on behalf on behalf of German Federal Ministry of Economic Cooperation (BMZ), the Open Society Initiative for Southern Africa (OSISA).

Funding: 1.6m euro from German Federal Ministry of Economic Cooperation (BMZ), 2008 – 2010 first phase

7.4   Other Funding Mechanisms

7.4.1   IICD

7.4.1.1   Promoting Quality Education through ICT

The project aimed to promote quality education in 11 primary schools and village polytechnics in Kajiado County, in school administration and class management through ICT by 2015. It also focused on improvement of management of TIVET institutions and the acquisition of pertinent skills for the labour market through ICT. The project aimed to improve the ICT infrastructure in primary schools to be used for school administration, class management as well as School Management Committee Management.

Target Area: Kajiado County, Kenya

Main partners: Connect4Change, Edukans, IICD (Netherlands), Dupoto (Kenya).

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[27] http://www.ict-innovation.fossfa.net/

Funding: €170,848, Edukans Netherlands, 2011 - 2015

7.4.1.2 Integration of ICT in vocational courses

The project focused on integration of ICT in vocational training courses that are trained at youth polytechnics. The pilot phase focuses on Motor Vehicle Technology and Fashion Design and Garment making Technology and also include entrepreneurship skills, life skills and reproductive health topics. Nairobits dealt with the technical capacity component, while the Ministry provided the infrastructure and technical capacity specific to the courses.

Target Country: Kenya

Main partners: Connect4Change, Edukans, IICD (Netherlands), Nairobits (Kenya).

Funding: €60,904, Edukans Netherlands, 2012 - 2015

8. KINGDOM OF LESOTHO

8.1 Introduction

The Kingdom of Lesotho is located in Southern Africa, an enclave of South Africa. Lesotho has an area of 30,355 km, with 10 administrative divisions (Berea, Butha-Buthe, Leribe, Mafeteng, Maseru, Mohale's Hoek, Mokhotlong, Qacha's Nek, Quthing, Thaba-Tseka). The population as at July 2018 was estimated to be 1.962 million[28] with a literacy rate of 79.4%. Sixty-two percent of the population is between 15 and 64 years of age (median 23 years). Maseru, the capital city, has a population of 202,000 (2018 CIA World Factbook). The official languages are Sesotho and English.

Key sectors in Lesotho are agriculture, followed by industry and services. Lesotho produces about 90% of its own electrical power needs. Economic growth is dependant on manufacturing and services.

There is a good Policy Framework including the ICT Policy (2005), Universal Access Fund (2009), Science Technology and Innovation Policy (2010), Communications Act (2012) and National Strategic Development Plan (2013 – 2017). The Electronic and Transaction Bill and Computer Crime and Cybercrime Bill are awaiting approval by the Parliament. The mountainous terrain presents challenges for eInfrastructure which is improving gradually with a national backbone (mix of copper cables, fibre optic cables and satellite), links to two submarine cables, establishment of the IXP and ongoing GSM network infrastructure projects being supported under the Universal Access Fund. ICT Initiatives are primarily focused on eLearning, eHealth, eGovernment, Cyber Security and eInfrastructure. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

In relation to Communications according to the Lesotho Communications Authority (LCA)[29] there were 28,206 fixed telephone subscribers and 2.23 million mobile subscriptions with a tele density rate of 120% as at March 2017.Fixed services continued to decline and by the end of March 2017, subscribers for fixed voice services had fallen to 28,206 from 40,570 in the corresponding period in 2016. Internet subscribers increased to 923,407 in March 2017 compared with 833,532 in March 2016.

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[28] CIA Factbook
[29] LCA Annual Report 2014-15, published June 2017

Lesotho is gradually increasing the focus on research with one public university (National University of Lesotho), Lerotholi Polytechnic, Lesotho College of Education, National Health Training Centre and a private university (Limkokwing University of Creative Technology).

8.2   Bilateral & Multilateral Cooperation

EU bilateral cooperation with Lesotho is focused on supporting poverty reduction through economic growth and enhanced provision of basic services. Lesotho has active cooperation agreements with Ireland, Germany, Italy and the United Kingdom.

Donor activities are coordinated through the European Development Agencies in Lesotho (EDAL) with participation of Ireland, UK and Germany and the Development Partners Consultative Form (DPCF) including UN agencies, World Bank and countries assisting Lesotho (USA, China, Libya) and the Donor Round Table. GIZ cooperates with the World Bank on Fiscal Decentralisation and Capacity Building and with EU Member States on Capacity building support to decentralisation.

While support has been provided to the Education sector, to date ICT and Innovation has not been highlighted as a national priority for donor support. Support has been received from European Commission (FP7, EDF10, EDF11, ACP-ICT) and Italy. Lesotho has a bilateral cooperation agreement with South Africa.

8.2.1   European Commission

Under EDF10 (2008 – 2013), 138 million euro was allocated with the focal areas including Human Development, Infrastructure. Lesotho leveraged ICT components with a number of projects funded under EDF10 as outlined in Table 4 below.

Table 4: EDF10 Projects funded in Lesotho with ICT components

Maseru Waste Water Project (€24.3 million): to rehabilitate and expand the sewage system in Maseru
Three Towns Water Supply and Sanitation project: to upgrade potable water supplies to the towns of Roma, Teyateyaneng and Maputsoe.
Turnkey Supply of an Integrated Financial Management Information System (IFMIS) (€7,299,701): contributes to the Government of Lesotho's effort to improve governance and accountability by improving Public Financial Management.

Under EDF11 (2014 - 2020) Lesotho is allocated €142 million with focal areas including Water, Energy, Governance. These focal areas are guided to development challenges aligned with Lesotho's Vision 2020. Water and Energy are key factors both for economic development as well as raising the living standards of urban, peri-urban and rural populations.

8.2.1.1   Framework Programme 7

Lesotho secured participation in **4** ICT FP7 projects with the Ministry of Communications, Science and Technology, Lesotho as a beneficiary under IST-Africa[30] Initiative 2008 – 2009, IST-Africa Initiative 2010 – 2011, IST-Africa Initiative 2012 – 2013 and IST-Africa Initiative 2014 – 2015.

Participation in IST-Africa facilitated MCST-L to host an IST-Africa FP7 Training Workshop in Maseru in September 2009, focused on FP7-ICT-Call 5, FP7-Infrastrucutures-2010-2 and FP7-AFRICA-2010 Calls for Proposals and a Stakeholder meeting focused on Horizon 2020 in November 2013. A number of proposals were submitted under FP7-Africa-2010 Call but unfortunately, they were not short listed for funding. MCST-L hosted a workshop on Living Labs in Lesotho in November 2012.

Proposals were prepared for submission under ICT-39-2015.

8.2.1.2   Horizon 2020

As part of its IST-Africa activities MCST-L circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has commenced an initial mapping of research expertise. MCST-L is working with the universities to gradually encourage the institutions to gradually transform from primarily teaching institutions to research and innovation engines to drive socio-economic development. The Ministry and IST-Africa continue to encourage the research community to explore opportunities for international research projects and build links to secure direct research funding. MCST-L hosted an IST-Africa Horizon 2020 workshop on 11 November 2013, on 16 September 2014 and 31 October 2016 (focused on the ICT-39-2017 Call).

Up to September 2018, Lesotho organisations have secured participation in 1 Horizon 2020 project

➢ H2020-ICT-2016-INT **IST-Africa 2016-2018** (CSA) - Ministry of Communications, Science and Technology

8.2.1.2   Africa4All Parliamentary Initiative[31]

Through the IST-Africa Initiative, the Parliament of Lesotho was a beneficiary in the Africa4All Parliamentary Initiative, which was funded under the @CP-ICT Call. This was a very important milestone for Lesotho and the Parliament benefited for this participation in terms of introducing new working methods to the MPs and support teams leveraging ICT tools.

Target Countries: Eastern and Southern Africa with pilots in Kenya, Tanzania, Uganda, Lesotho, Namibia

Main partner: Gov2u   **Partner in Lesotho**: National Assembly of Lesotho

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[30] http://www.ist-africa.org
[31] http://www.africa4all-project.eu/

Funding: 410k€ from EDF9 (@CP-ICT capacity-building programme) 2009-2011

8.2.2 Germany

Germany is focused on Governance, agrarian reform and rural infrastructure through strengthening administration and governance at a district level, policy advice and promotion of local economic development including employment. Technical support is provided through DED and capacity building through GIZ.

German development agency GIZ and the African Regional Agricultural Association (AFRACA) have also assisted the Central Bank of Lesotho strengthen its micro-finance operations by reviewing policy and legal framework. The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) has an office in Lesotho.

8.2.3 Ireland

Irish Aid's Programme is focused on Health (HIV/AIDS), Education (resources in primary schools and curriculum development), Water/Sanitation and Governance (Government Public Financial Management Programme, Parliamentary Reform Committee and Improvement of service delivery).

Lesotho is one of Ireland's nine priority countries for long-term strategic assistance. Ireland has had a development programme through Irish Aid in Lesotho since 1975, making it Ireland's oldest development partnership.

Development Cooperation Ireland (DCI) signed an €85 million agreement with the Government of Lesotho through which the Irish agency will help finance projects in education, enterprise development, governance, health, rural infrastructure, water and sanitation and, public sector improvement and reform.

Ireland and Cyprus have signed a partnership agreement to improve access to education in Lesotho. The cooperation agreement comprises of three phases

- Phase One (2007-2008)- €351,000: Construction of a dormitory, dining and kitchen areas and equipment which enabled 64 girls to attend school at Sekonyela High is a girl's boarding school in Mokhotlong district in the mountainous eastern part of Lesotho.

- Phase Two (2009-2010) - €540,000: The Lowlands Primary School Project, funded by Cyprus and managed by Ireland rebuilt four schools in 2010, which had been destroyed by high winds. A total of 12 classrooms, four administration blocks, one kitchen and toilet facilities were constructed that will benefit more than 600 students.

- Phase Three- €440,000: The construction of facilities at the Lerotholi Polytechnic, which will increase enrolment and tackle the skills shortage in the areas of science, mathematics and engineering in Lesotho. 600 additional Polytechnic students will be accommodated and will benefit from this initiative, which was completed in 2011.

8.2.4 Italy

Following the first meeting between OCCAM and the Ministry of Communication, Science and Technology of Lesotho held in May 2008 in Geneva on the occasion of the XI Session of the UN Commission of Science and Technology for Development, the subsequent exchange of letters and the fact finding mission in Lesotho that took place on June 26-30, 2009, it was agreed to create an ICT Village in the community of Mahobong (District of Leribe) in 3 areas of actions, namely food security, health and education.

The aims of the project were:

a) Improvement of health conditions of pregnant women, foetus and newborns in Mahobong area. OCCAM in partnership with the Hospital of Lodi and the scientific society WINFOCUS has realized a pilot project based on the use of the ultrasound. Due to its basic functions the ultrasound can be used by the medical staff and also by the nurses and midwives.

b) Increase in the agricultural production of the community in order to make it independent from the point of view of food security and to get a surplus that might be sold on the market.

Training on the use of ultra sound machine was undertaken with the nurses in Leribe. This has also been extended to The Faculty of Health at the National University of Lesotho and also St. Josephs School of nursing based next to the university at Roma.

8.2.5 Spain

The assistance Lesotho receives from Spain through the European Union (EU) has enabled the country to make visible strides on infrastructure development particularly construction of roads.

8.2.6 Denmark

Lesotho and Denmark have worked together on significant development projects in Lesotho including the Abattoir, Footbridges, Rural Clinics, Assistance to the Cooperative College, Good governance, and Meteorology.

8.2.7 Sweden

Lesotho and Sweden have successfully collaborated on a number of development and trade initiatives both at the bilateral and multilateral levels. Some of the notable examples of this collaboration include the development assistance offered by the Government of Sweden through the Swedish International Development Agency (SIDA) and the involvement of Swedish Construction and Engineering Companies in the Lesotho Highlands Water Project.

8.2.8 United Kingdom

The United Kingdom is focused on Governance (Government Public Financial Management Programme, Reform of the Justice sector, establishment of Revenue Authority), Health

(establishment of National Aids Commission to work with UNAIDS) and Food Security. DFID works closely with Irish Aid and GIZ.

9.   MALAWI

9.1   Introduction

Malawi is situated in the southern part of the East African Rift Valley, located between Mozambique in the east, Tanzania in the north and Zambia in the west. It has a surface area of over 118,000 square km, which consists of 28 administrative districts (Balaka, Blantyre, Chikwawa, Chiradzulu, Chitipa, Dedza, Dowa, Karonga, Kasungu, Likoma, Lilongwe, Machinga, Mangochi, Mchinji, Mulanje, Mwanza, Mzimba, Neno, Ntcheu, Nkhata Bay, Nkhotakota, Nsanje, Ntchisi, Phalombe, Rumphi, Salima, Thyolo, Zomba). The population is estimated to be in the region of 19.8 million (July 2018 CIA World FactBook) with an average yearly growth of around 3.3 % and a GDP per Capita of 1,100 USD. 51% of the population are between 15 - 64 years of age, with a literacy rate of 62.1%. The economy is heavily based on agriculture, with a largely rural population of 80% mainly engaged in small holder farming. Lilongwe, the capital city, has a population of 1.03 million (2018). The official languages are English and Chichewa, with other local languages also in use.

Malawi is among the world's least developed countries. The Government depends heavily on outside aid to meet development needs and faces challenges in building and expanding the economy, improving education, health care, environmental protection, and becoming financially independent. The foreign policy is pro-Western and includes positive diplomatic relations with most countries and participation in several international organisations. Natural resources include limestone, arable land, hydropower, coal and bauxite.

There is a good Policy Framework including the revised ICT Policy (2013) to include Universal Access, National ICT Master Plan for 2014 – 2031 (under development), Vision 2030 and Malawi Growth and Development Strategies (2016 - 2021). eInfrastructure is gradually improving with an expanded fibre infrastructure, Internet Exchange Point and Last Mile Connectivity & Universal Access projects. ICT Initiatives are primarily focused on eGovernment, eInfrastructures, eHealth, Technology-enhanced Learning and Digital Repositories. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

In relation to Communications, according to 2017figures (CIA World Factbook), there were 17,337 fixed phone lines in use compared with 7.77 million mobile phones and 1.78 million Internet users.

Malawi has a good research base and experience in collaborative research with 4 Public Universities (University of Malawi, Mzuzu University, Lilongwe University of Agriculture and Natural Resources and Malawi University of Science and Technology), 7 public Polytechnics and specialised Colleges and 4 private Colleges.

9.2 Bilateral & Multilateral Cooperation

Donors in Malawi are increasingly implementing the Paris Declaration Principles in their development assistance. Malawi's main donors are DFID (UK), European Commission, World Bank, African Development Bank, Norway, Germany, USAID, and China, which established diplomatic ties with Malawi in 2007. These account for over 90 percent of Malawi's development assistance. Other donors include the traditional UN institutions (notably UNDP, UNICEF, WHO, UNCDF and WFP), Global Fund, JICA, ICEIDA, and Ireland. The fundamental principles of Malawi's budget support cooperation are based on commitment to poverty reduction, good governance, and sound economic management.

Support for ICT and Innovation related activities are primarily from European Commission (FP7, H2020, EDF10, EDF11), Norway, UK, Scotland, Netherlands (IICD), China, India and Australia. The World Bank is providing support towards the Regional Communications Infrastructure Program and the Infrastructure Services Project. UNDP is providing support towards the development of the Master ICT Plan. The African Development Bank provided a loan which contributes towards putting ICT equipment and services for ICT Business Centres and laboratories at Chancellor College and the Polytechnic.

9.2.1 European Commission

Under EDF10 (2008 – 2013), €255 million was allocated with focal areas including Rural Development, Agriculture, Food Security and Natural Resources; Transport; General Budget Support. Malawi leveraged ICT as a cross cutting enabler in some EDF10 projects are outlined in Table 5 below.

Under EDF11 (2014 - 2020) €560 million has been allocated with the focal areas including Governance, Sustainable Agriculture, Secondary Education and Vocational Training.

Table 5: ICT-related Projects funded under EDF10 in Malawi within Economics and Good Governance Sector

Programme/Project	Description	Total Project amount €	Budget for ICT components
Trade Statistics and Information System under Capacity Building Towards Trade and Private Sector Development	The objective is to enhance capacity of responsible government departments to generate, process, package and monitor trade related information and statistics for policy making; and improve capacity of key agencies to provide timely, up to date trade intelligence for the private sector. Consists of several components one of which is the development of Improved Trade Statistics and Information System to be used by Malawi Revenue Authority (MRA), Ministry of Trade, National Statistical Office (NSO) and Malawi Investment Trade Center (MITC)	€3,000,000	€1,300,000

Democratic Governance Project - Ministry of Justice	The objective is to target the legal and judicial systems in Malawi with the aim of strengthening the democratic process and good governance, improve accountability and provide information and access to justice. One of the components is the development of an Integrated Case Management System for the Judiciary and Directorate of Public Prosecutions. The Case Management System is undergoing provisional acceptance procedures.	€32,500,000	€1,585,000

Through UbuntuNet Alliance and the Malawi Research and Educational Network (MAREN), Malawi is a beneficiary of the AfricaConnect and AfricaConnect 2 eInfrastructure projects co-funded under EDF10 and EDF11.

9.2.1.1 Framework Programme 7

The National Commission for Science and Technology (NCST) is a beneficiary under the IST-Africa Initiative since 2011.

Participation in IST-Africa facilitated NCST to host an IST-Africa FP7 Training Workshop in Lilongwe focused on FP7-ICT-Call 8 - 9 Calls for Proposals, as well as undertake a consultation with the research community to map expertise. NCST is raising awareness of the potential of Living Labs in Malawi.

Malawi secured participation in **20** FP7 projects with research funding in the region of **€3.06 million** in the following thematic areas: ICT (2 projects), INCO (1 project), Infrastructure (5 projects), Environment (2 projects), Health (8 projects), KBBE (1 project) and Science in Society (1 project).

The National Commission for Science and Technology as part of its activities under the IST-Africa Initiative is actively encouraging national stakeholders to continue building on the success to date.

9.2.1.2 Horizon 2020

As part of its ongoing IST-Africa activities NCST circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has undertaken an initial mapping of research capacity. NCST hosted an IST-Africa Stakeholder Meeting focused on Horizon 2020 on 24 January 2014, and a Training workshop specifically focused on ICT-39-2015 on 12 November 2014 and Training Workshop focused on ICT-39-2017 on 28 November 2016.

Up to September 2018, Malawi organisations have secured participation in 10 Horizon 2020 projects with research funding of over €2.625 million across a range of thematic areas:

➢ INFRA, H2020-INFRASUPP-2014-2 - **MAGIC** (UbuntuNet Alliance); **Sci-GaIA** (UbuntuNet Alliance); **TANDEM** (UbuntuNet Alliance)

➢ LEIT - ICT-39-2015 - **mHealth4Afrika** (Chancellor College, University of Malawi)

➢ H2020-WATER-2015-two-stage - **WATERSPOUTT** (University of Malawi)

- ➤ H2020-ICT-2016-INT - **IST-Africa 2016-2018** (Ministry of Education, Science and Technology)

- ➤ H2020-SC1-2016-RTD - **Perform 2 scale** (The Registered Trustees of the Research for Equity and Community Health Trust); **SURG-Africa** (University of Malawi)

- ➤ H2020-SFS-2016-2 - **InnovAfrica** (RIA) - Soils, Food and Healthy Communities (Sfhc) Limited and University of Malawi

- ➤ H2020-MSCA-ITN-2017 **- ANTHUSIA** (MSCA-ITN-EJD) - University of Malawi

9.2.2   Norway

Norway and Malawi have engaged in long-standing development cooperation as reflected in the Memorandum of Understanding concerning development co-operation signed in April 2001. The Government of Norway is currently providing training to ICT officers. Norway allocated a minimum of NOK 200,000,000 per year for support to the government sector in Malawi for the period 2008 - 2012.

Malawi also receives funds via NORAD as part of cooperation programmes between University of Malawi and University of Oslo.

9.2.3   United Kingdom

With funding from the Institute of Development Studies (IDS) of the UK, the Malawi Library and Information Consortium (MALICO) ran a one-year National Information Repository project from October 2011 with a budget of US$37,992.40. The main objective of the project was to set up a national digital repository of research from Malawi, collecting research outputs from Malawian institutions and building their capacities in global knowledge sharing. It is envisaged that the increased accessibility and visibility of Malawian research outputs will increase their impact on policy and bring more transparency to research institutions. IDS funding finished in 2013 and MALICO and the National Library have taken the responsibility for funding this work going forward.

A second aim was to learn from and utilize the related work of the Malawi Development Exchange (MDE) and NCST, ensuring close collaboration, identifying opportunities for further collaboration and avoiding duplication of effort. MDE focuses on development information from Malawi and on the people, who produce it. It offers a collection of online documents, a daily selection of news and commentary, discussion items, occasional feature articles, profiles of Malawian development practitioners and a search of Malawian websites.

The Tilitonse Fund, a 2011 - 2017 multi-donor programme was supported by the U.K. Department for International Development (DFID), Irish Aid, and the Royal Norwegian Embassy in Malawi. The Tilitonse Fund was established as grants facility to help Malawian-based civil society organisations promote accountable, inclusive, and responsive governance. The Fund partnered with the private sector, faith-based organizations, the media, and others to form coalitions that advocated for increased government transparency and accountability and improved public services. ICT related activities included supporting the National Media Institute for Southern Africa Malawi

Chapter to successfully advocate for passage of Malawi's Access to Information Bill, enhancing governmental accountability and responsiveness.

9.2.4   Scotland

Malawi and Scotland agreed that Scotland should assist Malawi Government to develop the Malawi Government website. Training was done in Scotland for two ICT officers that were responsible for the website.

9.2.5   China

The Malawi government embarked on an eGovernment programme in 2013, which will cost US $135 million over a four to five-year period, with support from the People's Republic of China. The projects include establishment of a national data centre, a Government Wide Area Network that will have a one integrated government network connecting all government offices in the country up to the district level, provision of e-services such as e-immigration, e-national registration and identification system, sharable geographic information system, electronic document management system, e-Learning platform for the public sector, enhanced electronic communication systems, electronic marketing systems and electronic security systems. Other activities include establishment of the Malawi Government Enterprise Architecture and Interoperability Framework. An instrument that will be used to eliminate silos implementation of ICT initiatives by Ministries Departments and Agencies and bring out a more centralised and integrated systems approach thereby reducing Government expenditure on repetitive efforts. The eGovernment project will help to provide easy access and sharing of information; easy management of systems and applications i.e. government website, e-mail services and easy management of Government computers in terms of security and virus protection. Additionally, Government officials are also sent to China for short-term technical courses every year.

9.2.6   India

Since independence, there has been bilateral cooperation with India in a number of areas such as agriculture, trade and investment, capacity building and more importantly technology. Because of increased cooperation, Malawi opened a resident Mission in New Delhi in February 2007.

Over the years, India has provided its assistance to Malawi mainly through the Export-Import Bank of India (EXIM Bank), Indian Technical and Special Economic Cooperation (ITEC) and the Commonwealth African Assistance Plan. Under ITEC, India offers scholarships and short-term training for transfer of technology. These initiatives continue to assist in the development of Malawi within the framework of the Malawi Growth and Development Strategy (MGDS).

India is also supporting a five-year PAN African e-network Project whereby the University of Malawi (Chancellor College in Zomba), a hospital in Lilongwe and the State House has been twinned with its counterpart in India through the e-VVIP connectivity. Through this initiative, Malawi has benefited in terms of eHealth, eLearning and eGovernance. The initial five years is now coming to a close and Chancellor College intends to continue to provide eLearning based on the experience and lessons

learnt from the Pan African eNetwork. As part of the plan it is envisaged that eLearning centre would be set up in regional cities in Malawi.

9.2.7   Australia

The Global Future Charitable Trust of Australia is sponsoring a National Library Services Project that will document and preserve Malawian Folktales through UNESCO offices in the country. The project is concerned with collecting folk- tales for education purposes. After the collection, the folktales will be put on various media devices such as CD's, DVDS as well as production of radio and television educational programmes.

An online annotated bibliographic index consisting of links to primary sources of the folk tales will be available in the public domain as well as scholarly discussions on these subjects will be established. The project has a budget of US$187,000. Sony of Japan has donated Video and still Cameras for the project.

9.2.8   World Bank

The World Bank has supported several ICT projects in Malawi. Firstly, there is the "Regional Communications Infrastructure Program" which is a Government of Malawi led intervention in the ICT sector to support policy and legislative reforms and provide affordable Internet capacity to the nation. The project aims at facilitating the provision of a wet portion (submarine cable) solution to dry portion (overland) connectivity to eligible countries. It is managed by the Privatisation Commission, in partnership with MACRA and the eGovernment Department.

Under the Enabling environment activity, the project among other things reviewed the Communication Act of 1998; build capacity amongst its agencies especially those involved in the policy and regulatory supervision of the ICT sector.

Another component of the Project is focused on connectivity, which will provide ICT equipment, Internet and free audio editing to selected public institutions in the country. By September 2013, the Last Mile Connectivity Initiative, which is the third phase of the project was implemented. The initiative saw 145 sites, which includes Teachers Development Centres, Teachers Training Colleges, District and Regional information offices being connected against a target of 100 sites. The second phase of the project saw the provision of Internet connectivity, terminal equipment, ICT equipment to all 30 District and Regional Information Offices in the country. This wound up in November 2013.

For the 145 connections to enjoy full Internet provisions through improved quality, availability and affordability of Internet capacity within Malawi for both public and private users, a consultant (SimbaNET) was identified to carry out this aspect. This was realised in 2014 by the commissioning of a Virtual Landing Point (VLP) in Lilongwe which connected to two redundant routes, one through the northern corridor to Tanzania and another one through Mchinji boarder to Zambia.

Monitoring and evaluation were undertaken during 2014 to determine if the third phase had started bearing fruits in the targeted institutions.

The World Bank through the Malawi Rural Finance is funding a project that complements and extends the existing portfolio of projects focused on agricultural development in Malawi to strengthen rural financial markets and improve the livelihoods of rural households. This project with a budget of US$ 224,220 aims to demonstrate how biometric technology can help improve the functioning of rural credit markets in Malawi by providing a way to uniquely identify borrowers. In particular, the project looks into whether fingerprinting of borrowers coupled with the use of fingerprint-based credit history databases can help lenders withhold credit from past defaulters, and expand credit to borrowers who have proven reliable, as well as increase borrowers' incentives to repay their loan.

The World Bank is funding the Infrastructure Services Project which will provide electricity; roads; piped water and sanitation as well as ICT communication to open up the rural areas. The ICT component includes 10 telecentres and 1274 telephones in the first phase.

Furthermore, the World Bank has collaborated with various donors in improving public sector management; for example: Implementation of an Integrated Financial Management Information System in collaboration with USAID and UNDP; Institutional strengthening and capacity development of the Central Internal Audit Unit in collaboration with the European Commission, including provision of training, equipment, software and work environment facilities.

9.2.9 UNDP

UNDP through its Public Reform Department provided funding towards the development of the Master ICT Plan. Its objective is to operationalise the approved National ICT Policy in order to realise the vision of making Malawi a knowledge-based economy by 2031. The plan for 2014 to 2031 is split into four (4) separate plans and incorporates both remedial and proactive interventions to create opportunities for Malawian citizens in order to create wealth and enhance people's quality of lives. The recommendations focus on the need to transform the society on four dimensions with ICT: capacity and knowledge community, businesses, infrastructure and the Government

9.2.10 African Development Bank

In 2017, the Government of Malawi received a loan from the African Development Bank (ADF) in various currencies towards the cost of Higher Education Support Project. Part of the funding was applied to eligible payments under the Ministry of Education, Science & Technology Education Infrastructure Management Unit for the Supply, Delivery and Installation of ICT Equipment and Services for ICT Business Centre and Laboratories at Chancellor College and the Polytechnic, constituent colleges of the University of Malawi.

10. MAURITIUS

10.1 Introduction

Mauritius is situated in the South West Indian Ocean, slightly over the tropic of Capricorn, in latitude 20° south and longitude 57° east of Greenwich. It is 2,000 km off the east coast of Africa and some 855 km east of Madagascar. An island of volcanic origin with an area of 1,864 km2, it is almost entirely surrounded by coral reefs. There are nine administrative districts and three dependencies*; Agalega Islands*, Black River, Cargados Carajos Shoals*, Flacq, Grand Port, Moka, Pamplemousses, Plaines Wilhems, Port Louis, Riviere du Rempart, Rodrigues* and Savanne.

The population is estimated at 1.364 million inhabitants in 2018 (CIA World FactBook) with a literacy rate of 89.8% (Statistics Mauritius 2017). In 2018, seventy percent of the total population was between 15 and 64 years of age (CIA World FactBook). Port Louis, the capital, has a population of 149,000 (2018 CIA World FactBook). The languages are Creole, Bhojpuri, French and English.

In just four decades, Mauritius has grown from an isolated mono-crop dependent country into a services-led economy enjoying sustained growth. The Mauritian economy rests on five pillars, namely sugar, tourism, textile, financial services and ICT. Although the tourism and the financial sectors are well anchored in its traditional economic setup, the ICT sector has recently been propelled into a major pillar of the Mauritian economy.

There is a good Policy Framework including the National ICT Strategic Plan (NICTSP), National Broadband Policy 2012 - 2020, eGovernment Strategy 2013 - 2017 and National Cyber Security Strategy and Action Plan (2014 - 2019). eInfrastructure is well developed across the island with an IXP, National PKI, links to three submarine cables, 236 computer clubs with free internet access and 100 public internet access points in Post Offices. ICT Initiatives are primarily focused on eEducation, eHealth, Digital Divide, eGovernment, Cyber Security, Entrepreneurship, Open Data and Green IT. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

In relation to Communications, according to the Information and Communication Technologies Authority, there were 421,400 fixed phone line subscriptions (33.29% penetration rate), 1.850 million phone subscriptions (146% penetration) and more than 1.28 internet subscriptions (101.4% penetration) in June 2018.

Mauritius has a good research base seven tertiary education institutions: the University of Mauritius (UoM), University of Technology, Mauritius (UTM), the Mahatma Gandhi Institute (MGI), the

Rabindranath Tagore Institute (RTI), the Open University of Mauritius (OU), the Fashion Design Institute (FDI) and the Université des Mascareignes. Three public institutions also run programmes at the tertiary level: the Mauritius Institute of Training and Development (MITD), the Mauritius Institute of Health (MIH) and the Mauritius Institute of Education (MIE). In addition to the seven institutions, 55 private institutions are registered locally, providing tertiary education in diverse fields, ranging from Certificate to PhD, with the awarding bodies mostly based overseas (52 out of 58).

10.2   Bilateral & Multilateral Cooperation

France and the United Kingdom have active cooperation agreements with Mauritius. General budget support for the economic reform of the Government of Mauritius is provided by the World Bank, the Agence Française de Développement (AFD), African Development Bank and the EC (EDF 10, EDF 11).

Mauritius is one of the beneficiary countries in the Digital4Development Cyber Resilience for Development project. This project aims to strengthen Cybersecurity Policy, Strategical, and Coordination Frameworks, increase Cybersecurity Incident Response Capabilities and foster networks of cyber expertise and cooperation. During Q4 2018 a project coordinator has been set up in Mauritius with responsibility for supporting the development of detailed action plans to deliver National Cyber Security Strategies. They are also planning project launch events due in early 2019.

Support for ICT and Innovation activities has primarily been from the European Commission (FP7, EDF10, EDF11 ACP), India (Cyber City and IT Education projects), African Development Bank, World Bank, Canada and France.

10.2.1 European Commission

Under EDF10 (2008 – 2013), €63.4 million was allocated. Table 56 below provides an overview of ICT-related projects funded under EDF10.

Table 6: ICT-related Projects funded under EDF10 in Mauritius

Project Name	Focus	Budget
Consultancy for 'Ensuring the compliance of the data protection legislation and principles of Mauritius with EU standards'	The global objective of this assignment is to amend the Data Protection Act in the perspective of achieving compliance with the EU data protection laws, and to improve the existing institutional set-up of the Data Protection Office to meet international standards.	€30,000
Capacity Building Programme on Green IT and Energy and Energy Efficient Data Centres	NCB organised three training sessions during the period May-June 2013: (a) Green IT (b) EU Code of Conduct for Data Centres and (c) Energy and Cost Management in Data Centres, all leading to industry certification from BCS, the Chartered Institute for IT. The objective of this Capacity building programme is to raise awareness on the opportunities for energy and cost efficiency within the industry and gives guidance on initiatives and changes that can be made to improve the efficiency of the data centre	Rs. 3.2 m (€83,756)

	infrastructure, as well as the IT equipment.	
Consultancy Services on Sustainable Buildings and Construction for Mauritius	The Ministry of Environment and Sustainable Development (MOESD), in collaboration with the United Nations Environment Programme (UNEP), developed a National Programme on Sustainable Consumption and Production (SCP) for Mauritius for the period 2008 - 2013. One of the key priority areas identified in the SCP programme is Sustainable Buildings and Construction. In this context, the government requested for Consultancy Services to develop a policy on Sustainable Buildings and Construction, including guidelines on sustainable buildings. The global objective of this assignment was to establish a comprehensive framework to promote sustainable buildings in the Republic of Mauritius (island of Mauritius and Rodrigues).	€171,000
Consultancy Services on the development of national policy, strategy and action plan for the management of electrical and electronic equipment wastes (e-wastes)	This project is currently in progress where three experts funded by the European Union is developing the E-Waste Policy, Strategy and Action Plan for Mauritius. The specific objectives of this project are: a) Assess and evaluate existing e-waste policy, initiatives, gaps, challenges and opportunities in/for the management of e-wastes in Mauritius. b) Develop comprehensive national e-waste policy, strategies and an action plan for the environmentally sound management (ESM) of e-wastes in Mauritius. c) Recommend appropriate economic and policy instruments and financing mechanism which will favour the ESM management of e-wastes in Mauritius d) Recommend appropriate legal, institutional and administrative framework for the ESM of e-wastes in Mauritius.	€177,000

National Open Source Policy, Strategy and Action Plan	A National Open Source Policy Strategy and Action Plan has been developed with the assistance of two consultants from Astec Global Consulting Ltd. The main objective of this project was to develop strategies and plans for reinforcing the use of Open Source Software to enhance value and improve efficiency within the Mauritian public and, indirectly, private ICT sector, SMEs and boosts local capacity to help develop local knowledge communities. Four Strategic Pillars associated with specific goals and targets have been identified as necessary for the growth of an OSS ecosystem namely: a) OSS enabled education system on all levels b) OSS based research activities on universities and tertiary education c) Common place for all Open Source Software, Open Standard, Open Content and Open Data activities d) Common collaboration platform and technology platform	Rs2.4 million (€63,224)
ENERGIC Platform	The objective of the ENERGIC platform is to contribute to sharing of information, networking and capacity building of players of the IOC Member States working in the energy sector. It provides resources on renewable energy and energy efficient including reports, videos and articles on the sector. It has been set up in the context of the 10th EDF regional renewable energy and energy efficiency programme.	€5,600 from May 2017 to Nov 2019

10.2.1.1 Framework Programme 7

The National Computer Board is a beneficiary under the IST-Africa Initiative[32] since 2009.

Participation in IST-Africa facilitated NCB to host an IST-Africa FP7 Training Workshop in Port Louis focused on FP7-AFRICA-2010 and FP7-ICT-Call 6 Calls for Proposals in 2009. NCB funded an additional IST-Africa FP7 Training Workshop in Port Louis focused on FP7-ICT-Call 10 and Call 11 and an IST-Africa Living Lab Workshop in November 2012. NCB undertook a survey of Living Labs and Innovation Spaces active and emerging in Mauritius and is raising awareness of the potential of Living Labs in Mauritius.

Mauritius secured participation in **six** projects under FP7: ICT (3 projects), Infrastructure (2 projects) and Health (1 project).

There is now an appetite for participation in internationally funded research including EU funded research, and the number of funded projects is expected to increase in future years.

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[32] http://www.ist-africa.org

10.2.1.2   Horizon 2020

NCB hosted a Stakeholder meeting focused on Horizon 2020 in November 2013 and a Horizon 2020 Training Workshop specifically focused on ICT-39-2017 Call on 14 December 2016.

NCB in collaboration with the Ministry of ICT hosted IST-Africa 2014 Conference from 06 - 09 May 2014 which attracted over 460 delegates from 44 countries representing policy makers, practitioners, and researchers from leading commercial, government and research organisations around the world.

As part of its ongoing IST-Africa activities NCB has undertake a consultation with the research community to map expertise, circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has undertaken an initial mapping of research capacity.

Up to September 2018 Mauritius organisations have been successful in 2 Horizon 2020 projects

➢ H2020-ICT-2016-INT**- IST-Africa 2016-2018** (CSA) - National Computer Board

➢ H2020-MSCA-RISE-2016 - **SLAFNET** MSCA-RISE) - University of Mauritius

10.2.1.2   ACP

10.2.1.2.1   Collaborative Curriculum Development on Waste Management in Africa and the pacific Region (CODWAP), 2008-2011

CODWAP[33] aimed to establish an active and sustainable co-operation forum on curriculum development, which is consistent with APR socio-economic development priorities. The development of Solid Waste Management (SWM) educational tools, which are customised, easy-to-use, practical and suitable to the needs and priorities of the participating African and Pacific Region (APR) countries, is formulated around a Master Course on SWM (to be piloted by the University of Mauritius), as well as a number of related training courses, both in the EU and APR countries. The partners included University of Mauritius, Papua New Guinea University of Technology, University of Sierra Leone, Bremen University of Applied Sciences (Germany).

The project duration was 36 months with EU funding of EUR 497,819.00

10.2.1.2.2   Small Developing Island Renewable Energy Knowledge and Technology Transfer Network (DIREKT), 2009-2012

The Small Developing Island Renewable Energy Knowledge and Technology Transfer Network (DIREKT[34]) is a cooperation scheme involving universities from Germany, Fiji, Mauritius (University of Mauritius), Barbados and Trinidad & Tobago with the aim of strengthening the science and technology capacity in the field of renewable energy of a sample of ACP (Africa, Caribbean, Pacific)

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[33] http://acp-edulink.eu/content/codwap-collaborative-curriculum-development-waste-management-africa-and-pacific-region-0\
[34] http://www.direkt-project.eu/

small island developing states, by means of technology transfer, information exchange and networking. Developing countries are especially vulnerable to problems associated with climate change and much can be gained by raising their capacity in the field of renewable energy, which is a key area.

The project was funded by the ACP Science and Technology Programme, an EU programme for cooperation between the European Union and the ACP region (Africa, Caribbean, Pacific). http://www.direkt-project.eu/

10.2.1.2.3   L3EAP, 2013 – 2016

The purpose of the L³EAP[35] project is to increase the capacity of universities in African, Caribbean and Pacific Group of States (ACP) SIDS to deliver high-quality Lifelong Learning courses on the topics of energy access, security and efficiency.

The three-year half million Euro project will be coordinated by Hamburg University of Applied Sciences in partnership with USP, University of Mauritius and Papua New Guinea University of Technology. The project is ongoing.

10.2.2 Canada (IDRC)

10.2.2.1 Development of an open platform for "Volunteer thinking"

The project is being undertaken by the University of Mauritius. It is funded by International Development Research Centre (IDRC), a Canadian funding agency, as a wider effort to promote open science. The initial investigation will look into how problems can be broken down into tasks so that they can be outsourced to volunteers, an undefined public. A proposal is actually being sought out in collaboration with researchers from CERN (European Organization for Nuclear Research.) and co-founders of the Open Knowledge Foundation. The considered direction is how problems related to skin lesions in developing regions can be applied with crowd-based analysis to detect skin cancers as well as other diseases.

10.2.3 France

10.2.3.1 Connection of Rodrigues to submarine fibre optic

The Government is committed to bring Rodrigues to the same level of development as Mauritius in the ICT field and believes that, to achieve this objective, connecting Rodrigues to a submarine fibre optic cable is essential. The "Agence Française de Developpement" (AFD) has funded the consultancy exercise for the feasibility study to the tune of €100,000.

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[35] http://project-l3eap.eu/

10.2.3.2 Open Hardware Web API

The main aim of the project is to provide a tool that supports Machine to Machine interaction in the context of pervasive computing. We are studying the possibility of devising the tool for real time web based interaction with the physical world sensors. This tool will help programmers/engineers with basic or no knowledge of C/C++ or electronics to use and access sensors on programmable boards remotely through a secure web API.

Funded by France Telecom (Orange Labs) to the tune of € 5000.

10.2.4 African Development Bank

10.2.4.1 Review of the National ICT Strategic Plan (NICTSP) 2007–2011

The review of the National ICT Strategic Plan (NICTSP) 2007–2011 is one of the three activities undertaken under the Competitiveness and Public Sector Efficiency (CPSE) program, which aims to sustain growth and employment, while helping Mauritius to address the impact of the global recession. The CSPE program aligns with Mauritius' long-term development objectives. These centre on the kind of economic development that will allow it to move away from low-wage, labour-intensive exports to more skilled, high value-added, knowledge-based ones. It seeks to deepen the reforms initiated in 2006 and supports Government's more immediate efforts to help the country ride out the global economic downturn.

The funding was from the African Development Bank Group under the MIC Grant Supporting the Mauritius Competitiveness and Public Sector Efficiency Program (CPSE)

Funding: 299,840 USD

10.2.5 World Bank

During 2014 - 215 the World Bank funded an Open Data Readiness Assessment (ODRA) for Mauritius.

10.2.6 Sustainable public procurement

Sustainable public procurement (SPP) is a tool that allows governments to leverage public spending in order to promote the country's social, environmental and economic policies. The present public procurement policy in Mauritius does not formally take into account sustainability aspects. The Government of Mauritius recognises that procurement decisions by public bodies have inherent social, public, health, environmental and economic impacts both locally and globally and; both at present and in the future. Since 2009, the United Nations Environment Programme (UNEP) has been running a project aimed at supporting the development of SPP policies and the implementation of SPP in pilot countries including Mauritius. The Government of the Republic of Mauritius has agreed to be one of the pilot countries for the SPP capacity building project administered by UNEP on behalf of the Marrakech Task Force on SPP, led by Switzerland. The

Public Procurement Office has been identified as the enabler for implementing the SPP project. An agreement has been signed between the PPO and UNEP for financing the SPP project.

Funding: An amount of Rs 700,000 has been obtained by the PPO for training purposes. A further sum of Rs 2M will be given by UNEP for further training.

11. REPUBLIC OF MOZAMBIQUE

11.1 Introduction

The Republic of Mozambique is located in Southern Africa, bordered by Malawi, South Africa, Eswatini, Tanzania, Zambia and Zimbabwe. The Mozambique Channel is to the east. Mozambique has an area of 799,380 km² and eleven provinces: Cabo Delgado, Niassa, Nampula, Tete, Zambézia, Manica, Sofala, Inhambane, Gaza, Maputo Province and Maputo-Cidade. The population is estimated at 28.927.2 million inhabitants (August 2017 National Population Census) with a literacy rate of 58.8%. Fifty-two percent of the population is aged between 15 and 64 (median 17 years)[36]. The capital city is Maputo with a population of 1.102 million (2018 CIA World Factbook). Portuguese is the official language and there are several indigenous languages as national languages. English is widely used in business and government.

Mozambique is still heavily dependant upon foreign assistance to support its annual budget. As part of a diversification programme the Government of Mozambique has encouraged donors of invest in ICT and to assist in developing ICT-related systems, infrastructure and human capacity within the Government as part of the ICT Implementation Strategy and eGovernment Strategy and also in the Higher Education Institutions.

There is a good Policy Framework including the ICT Policy (2000) and ICT Policy Implementation Strategy (2002). eInfrastructure is gradually improving with a National Broadband Backbone providing optical fibre connection to all 11 provincial capitals, provincial Digital Resource Centres, an IXP in Maputo, the Mozambique Research and Education Network and links to two submarine cables. ICT Initiatives are primarily focused on eGovernment, eHealth, eInfrastructure, Digital Content and Digital Divide. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

Mozambique reformed its telecommunications landscape in 1992. While the mobile sub-sector experienced growth rates with the introduction of competition, growth has slowed due to ineffective cost structures and insufficient infrastructure. In terms of Communications there were 80,545 fixed phone lines in use; 11,875 million mobile users and 4.5 million Internet users (2017 CIA World Factbook). During 2013 the Government initiated a revision of the 2004 Telecommunications Act to support the development of infrastructure and greater competition.

Mozambique has research capacity and a track record in collaborative research with 2 Public Universities, 8 public Higher Education Institutions, 10 private Universities and 22 private Higher Education Institutions. Twenty-two institutions are dedicated to research activities, 15 of which are government institutions and 7 private.

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[36] CIA Factbook

11.2   Bilateral & Multilateral Cooperation

Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, United Kingdom, Canada, Japan and US provide donor support to Mozambique, primarily toward general budgetary support. focused on national development priorities including Macro-economic, Financial and Trade Policies; Good Governance, Legality & Justice, Capacity Building in Education and Health and Priority Sector (Agriculture & Rural Development, Transport Infrastructure, Energy and Water and Sanitation).

Support for ICT and Innovation related activities are primarily from European Commission (FP7, H2020, EDF11), Finland, Germany and Italy.

11.2.1 European Commission

Under EDF10 (2008-2013) €634 million was allocated, with the focal areas including Transport Infrastructure; Agriculture and Rural Development; Support Measures.

Under EDF11 (2014 - 2020) Mozambique is allocated €732 million with focal areas including General Budget Support; Rural Development.

Through UbuntuNet Alliance and the Mozambique Research and Educational Network (MoRENet), Mozambique is a beneficiary of the AfricaConnect and AfricaConnect 2 eInfrastructure project co-funded under EDF10 and EDF11.

11.2.1.1   Framework Programme 7

Instituto Nacional das Tecnologias de Informação e Comunicação (INTIC) is a beneficiary under the IST-Africa Initiative since 2005.

Participation in IST-Africa facilitated INTIC to host an IST-Africa FP7 Training Workshop INTIC is raising awareness of the potential of Living Labs methodologies in Mozambique.

Mozambique built up a good track record of participation in FP7 with successful participation in **20** projects and research funding in the region of **€3.36 million**: ICT (5 projects), Environment (3 projects), Health (6 projects), Food, Agriculture and Biotechnology KBBE (2 projects) and Space (4 projects). This is a direct result of the greater international visibility achieved by hosting the IST-Africa 2007 Conference in Maputo and the sensitisation undertaken during IST-Africa FP7 Workshops at a national level.

10.2.1.2   Horizon 2020

As part of its ongoing IST-Africa activities INTIC circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has undertaken an initial mapping of research expertise. INTIC hosted a Horizon 2020 Training Workshop in Maputo in December 2013.

INTIC supported the EU Delegation in Maputo to organise a Horizon 2020 Information Day in Maputo in November 2018 for 300 participants.

Through IST-Africa activities INTIC has instigated an ICT researcher network across the various institutions undertaking research activities in Mozambique.

Up to September 2018 Mozambique organisations have been successful in 8 Horizon 2020 projects with research funding of over €1 million across a range of thematic areas:

➢ HEALTH, H2020-PHC-2014-single-stage - **EMI-TB** (Instituto Nacional de Saúde)

➢ H2020-PHC-2015-single-stage_RTD - **EHVA** (Instituto Nacional de Saúde)

➢ H2020-WATER-2015-two-stage: **DAFNE** (Universidade Eduardo Mondlane); **SafeWaterAfrica** (Salomon Lda)

➢ H2020-ICT-2016-INT - **IST-Africa 2016-2018** Instituto Nacional de Tecnologias de Informacao E Comunicacao

➢ H2020-SC5-2016-OneStageB - **FORAM** - Gondwana Empreendimentos E Consultorias Limitada

➢ H2020-SFS-2017-1 **- AfriCultuReS** (RIA) - Universidade Eduardo Mondlane

➢ H2020-MSCA-ITN-2017 - **ANTHUSIA** (MSCA-ITN-EJD) - Universidade Eduardo Mondlane

11.2.1.3 ExTTI: Excellence in ICT Use for Learning Purposes – Developing Competences and Establishing Best Practices

ExTTI - "Excellence in ICT use for learning purposes - developing competences and establishing best practices", was a project of institutional cooperation, financed by the European Commission´s 9th European Development Fund, within the ACP (Africa, Caribbean and Pacific) - Information and Communication Technologies Programme (@CP-ICT Programme) - ACP Science and Technology Programme.

Target Country: Mozambique

Main partners: Instituto Superior de Estatística e Gestão de Informação da Universidade Nova de Lisboa

Funding: €560,000 from EDF9 (@CP-ICT capacity-building programme) 2009-2011

11.2.1.4 TIC (Through Innovative Contributions): Students eSkills Development Programme & Distance Learning

"ICT-Through Innovative Contributions" was a metrical action, intended to be innovative by providing a cross between education and professional training, use and access of ICT tools, the MDGs aspirations and the empowerment of the targeted audiences, in conjunction with a view to reduce poverty in specific locations in Mozambique and Cape Verde. The notion of a metric also concurs in this project for the articulation between the involved features in each country, supposing

that the results of one are conditioned by the characteristic of another. Assuming ICTs as a compulsory and cross-cutting area of action and recognizing the thematic areas such as: HIV / AIDS, Food security and Hygiene, Gender Equality and Entrepreneurship. This project is a result of a partnership between the Portuguese Piaget Institute, as a coordinator, and the Universities of Piaget Mozambique and Cape Verde, through EDF (EuropeAid via the ACP group) funding.

Target Countries: Mozambique, Cape Verde

Main partner: Instituto Piaget

Funding: €780,000 from EDF9 (@CP-ICT capacity-building programme) 2009-2011

11.2.2 Finland

11.2.2.1 STIFIMO (Programme of Cooperation in Science, Technology & Innovation between Finland and Mozambique)

The main purpose of this Programme was to enhance the national science, technology and innovation system, so that it contributes effectively to economic growth and poverty alleviation. With an overall objective of accelerating the transformation of the social, economic, environmental and institutional dimensions of Mozambique, to be characterised by a widespread culture of innovation and strong innovation capacities, high-quality human resources, active and innovative public and private sectors with the ability to identify and resolve current and future development-related challenges coherently, and collaboratively supported by scientific and technological knowledge, in line with international good practices. The Programme leveraged the experiences of launching Innovation Programme such as SAFIPA in South Africa.

Target Country: Mozambique

Main partners: Ministry for Foreign Affairs Finland (MFA), Ministry of Science & Technology Mozambique (MST), private sector partners

Funding: €22 million, 2010-2014

11.2.2.2 CSBKE (Creating Sustainable Business in the Knowledge Economy)

Finland, Nokia, and infoDev were partners in the Creating Sustainable Businesses in the Knowledge Economy Programme, with the aim of encouraging innovation and competitiveness among SMEs in the information and communication technologies and agribusiness sectors in particular. This programme focused on improving capacity of Sub-Saharan business incubators in mobile applications development, social networking and market deployment.

Target Countries: Southern and Eastern Africa, pilots in Tanzania, Mozambique and South Africa

Main Partners: Ministry for Foreign Affairs Finland (MFA), InfoDEV Programme, Nokia Corporation

Funding: Global programme of which €3.3 million allocated to Africa from MFA for period 2010-2012

11.2.2.3   Southern Africa Innovation Support Programme (SAIS)

SAIS[37] focused on supporting a regional innovation system in SADC and promoting collaboration in relation to innovation systems between Botswana, Mozambique, Namibia and Zambia. MICTI was the national partner.

Partners: Mozambique ICT Institute (MICTI), Botswana Innovation Hub (BIH), Namibia Business Innovation Centre (NBIC) and National Technology Business Centre, Zambia

Funding: €6.2 million Ministry of Foreign Affairs Finland 2011 - 2015

11.2.3   Germany

11.2.3.1 Mobile Banking in Rural Areas

Banco Oportunidade of Mozambique received 2 million Euro to co-finance a business development project to build capacity to sustainably finance agriculture, particularly targeting smallholders. Banco Oportunidade de Mocambique financed the remaining portion of the project costs from its own funds. The partnership with development institutions and donors helped Banco Oportunidade de Mocambique to train staff, develop new products, and establish new distribution channels through satellite branches and new mobile banks. These efforts are expected to significantly increase its planned outreach in rural areas to benefit agriculture customers.

Target Countries: Ghana, Mozambique

Main partners: KfW on behalf of German Federal Ministry of Economic Cooperation (BMZ)

Funding: €9.5 M (Ghana), €2 M (Mozambique)

11.2.3.2 ict@innovation

ict@innovation[38] was focused on building capacities in African Small and Medium sized ICT enterprises in relation to using Free and Open Source Software (FOSS) by spreading FOSS business models for enterprises in Africa, fostering FOSS certification and supporting innovative local FOSS applications for social and economic development.

Target Countries: Eastern and Southern Africa (Kenya, Malawi, Mozambique, Rwanda, South Africa, Tanzania, Uganda, Ethiopia, Namibia, Zambia)

Main partners: Partnership of FOSSFA (Free Software and Open Source Foundation for Africa) and InWEnt - Capacity Building International on behalf on behalf of German Federal Ministry of Economic Cooperation (BMZ), the Open Society Initiative for Southern Africa (OSISA).

Funding: 1.6m euro from German Federal Ministry of Economic Cooperation (BMZ), 2008 – 2010 first phase

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[37] www.saisprogramme.com
[38] http://www.ict-innovation.fossfa.net/

11.2.4 Italy

11.2.4.1 Government Electronic Network – E-Governments in the Districts

The Mozambican Government Electronic Network (GovNET) was established in 2004 with the support of the Italian Government and during its first phase several selected public institutions at central level were linked, through a communication platform that provided email services and a connection to Internet services. A Government Portal was designed that provided Intranet facilities for public servants and information of government services, plans, acts and documents. From 2005 to 2009 the network was extended to cover all provincial capitals and from 2010 to 2013 that network was extended to all the 128 districts. The project also strengthened government capacity building programs and provided applications through which services were delivered using electronic tools. The project aimed to improve the organization and efficiency of the public administration.

The second phase of GovNET project will begin In 2019, with the aim of training local technicians from all Districts linked to GovNet in ICT technical matters so that urgent, "simple and small" problems can be solved without intervention of the Provincial Digital Resource Centers (CPRDs). It aims to introduce district officials to using computers and basic concepts of information and communication technologies.

Target Country: Mozambique

Main partners: Agencia Italiana de Cooperação para o Desemnvolvimento (AICD), Ministry of Science and Technology, Higher Education and Professional Technician (MCTESTP) **Funding**: €4.8 million 2010-2013, further funding will be allocated in 2019

11.2.4.2 Digital Inclusion of people with disabilities

The project is focused on making computer-based solutions more accessible to the visually impaired, helping them, and adapting to their limitations in performing simple tasks or presenting some kind of complexity. This project aims to provide the disabled with ICT resources as auxiliary tools to access knowledge and training.

Target Country: Mozambique

Main partners: Agencia Italiana de Cooperação para o Desemnvolvimento (AICD), Ministry of Science and Technology, Higher Education and Professional Technician (MCTESTP)

11.2.4.3 Cybernetic security of computer networks

This project aims to address cyber security including access rights, antivirus software, application-level security and behavioral analysis to support the detection of intrusions in institutional networks.

Target Country: Mozambique

Main Partners: Italian Agency for Development Cooperation (AICD), Italy and Ministry of Science and Technology of Higher Education and Technical Profissional-Mozambique (MSTHEPT)

11.2.5   Belgium / Norway

11.2.5.1 SISTAFE

The Government of Mozambique is carrying out a Public Financial Management Reform as an integral part of a wider Public Sector Reform aiming at promoting good governance. The commitment to the Public Financial Management Reform was demonstrated by the Assembly of the Republic when it approved the SISTAFE law in 2002. The SISTAFE law covers the 5 functional areas: public sector budgeting, accounting, fixed asset management, treasury operations and internal control and set out a vision for Public Financial Management in line with international standards. It is regulated by Decree No. 23 / 2004, of 20 August, which contains the main budgetary, financial, property, accounting and internal control standards of the State.

Norway provided support to the SISTAFE reform since the beginning of the reform in 2002 until 2009. The implementation of the reform has led to significant improvements in public financial management as documented in the PEFA-study published in 2008. Belgian put some money on the SISTAFE Common Fund, with the objective of introducing a modern and integrated system for budget preparation, budget execution and treasury activities in the Government of Mozambique.

e-SISTAFE, the information technology platform of the State Financial Administration System (SISTAFE) includes the following modules: Budget Preparation Module (MEO) Budget Execution Module (MEX) Information Management Module (MGI) Wages and Pensions Module (MSP, which includes the e-SHEET and the Pension Payment Module.

Target Countries: Mozambique

Main Partners: Belgium, Norway, Ministry of Finance, Mozambique (MF)

11.2.6   Portugal

11.2.6.1 Rural Telecommunications Network Improvement Phase II

Rural telecommunications network improvement - phase II commitment 2: contract- supply and installation of rural telecom networks in the Provinces of Gaza & Inhambane. The overall objective is to grant access to basic telephony services to the majority of rural inhabitants. Phase II is specifically focused on providing rural communities of the Provinces of Gaza and Inhambane (not covered under Phase I of the project) with a reliable rural telecommunication system, which will provide telephone services between districts and provincial capitals and thus access to the national network.

Target Countries: Mozambique

Main Partners: Gaza and Inhambane Provincial Governments

Funding: €1,223,087

11.2.6.2 Co-operation Protocol between Portugal and Mozambique in the postal and telecommunications sectors

The co-operation protocol includes a number of technical missions and training in the following areas: a) Normalization, Equipment certification and ITED; b) Accounting and Financial Management, Management of Human resources and Services of Documentation and Attendance to the Public; c) Regulation of the Postal Sector and of the Telecommunications sector; d) Engineering of Telecommunications and Management of the Spectrum, Numeration and Fiscalization.

Target Countries: Mozambique

Main Partners: Ministry of Foreign Affairs Portugal and Ministry of Transport and Communication Mozambique, National Telecommunication Regulator (INCM)

Funding: €282,288

11.2.6.3 Digital Certification

This project aims to develop a certification tool and digital signatures of official documents of the Public Administration, citizens and companies, promoting the flow of administrative and financial processes and the security of electronic transactions.

Target Country: Mozambique

Partner: Portugal – Fundo Europeu para o Desenvolvimento (FED)-CAMOES-Institute for Cooperation and the Portuguese Language

11.2.7   UNESCO

11.2.7.1 21st Century Schools

This project is a continuation of the infrastructure process of educational institutions through the acquisition of computer equipment and connectivity, in order to support the implementation of the interactive teaching system and the administrative operation of schools.

Target Country: Mozambique

Partner: UNESCO

11.2.7.2 21st Century Curricula

This project is focused on updating the academic curricula, taking into account key competences for the development of Mozambican society in order to stimulate the use of ICT as a learning tool.

Target Country: Mozambique

Partner: UNESCO

11.2.7.3   Policy and Master Plan of ICT in Education

This project is focused on the development of guiding instruments for the use and massification of ICTs in education, namely the ICT Policy and Master Plan.

Target Country: Mozambique

Partner: UNESCO

12.   REPUBLIC OF NAMIBIA

12.1   Introduction

Namibia is situated in South Western Africa, bordered by the Atlantic Ocean in the west, Angola and Zambia in the north, Botswana and Zimbabwe in the east and South Africa in the South. The country has a surface area of 824,292 km² with 14 administrative divisions. The population as at July 2018 was estimated at 2.533 million inhabitants with a literacy rate of 81.9%[39]. 59.5% of the total population is between the ages of 15 - 64, with a median age of 22 years. Windhoek, the capital city, has a population of 404,000 (2018, CIA World FactBook). Namibia is multi-cultural with English as the official language, and 16 other languages spoken. Namibia is one of the first countries to incorporate protection of the environment into its constitution with approx 14% of its land being protected including the Namib Desert coastal strip.

In relation to Communications, according to figures provided by the Communication Regulatory Authority of Namibia (CRAN)[40] there were 187,853 fixed phone subscribers, 2.66 million mobile phone subscribers and 1.58 million mobile Internet users in December 2016.

There is a good Policy Framework in place including Vision 2030; National Development Plan 5, NRSTIP, ICT Policy (1995), eGovernment Policy (2005) and ICT in Education Policy (2005). eInfrastructure is improving with fibre optic cables connections to all major towns, investment in a national wide terrestrial fibre backbone infrastructure, IXP, Xnet (NREN) and links to two submarine cables. ICT Initiatives include eEducation, eHealth and eGovernment. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

Namibia is gradually increasing the focus on research with 2 Public Higher Education Institutions (University of Namibia, Namibia University of Science and Technology) and one private University (International University of Management).

12.2   Bilateral & Multilateral Cooperation

European Embassies in Namibia include Germany, France, Spain, UK, Portugal, Finland and the EU Delegation.

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[39] CIA World FactBook

[40] CRAN Stats Newsletter December 2016

Support for ICT and Innovation-related activities is primarily from European Commission (FP7, H2020, EDF, ACP-ICT), Finland and India. Germany provided support to the regional ict@innovation Open Source Project and Germany and the Netherlands have contributed towards education programmes in the past. Namibia and South Africa have a Bilateral STI Agreement, which has launched a number of Joint Research Calls with some ICT-related projects selected for funding.

12.2.1 European Commission

Under EDF10 (2008 – 2013), €103 million was allocated with the focal areas including Rural Development, Human Resources Development, Support Measures. Table 7 below provides an overview of ICT-related projects funded under EDF10 in Namibia.

Table 7: ICT-related Projects funded under EDF10 in Namibia

Programme Name	Project Name
Focal Sector	
Human Resources Development (ETSIP, €42.5 million)	**Information, Adult and Lifelong Learning** Improving and strengthening equitable access to information and Learning resources, Strengthening the quality and effectiveness of knowledge management systems, Setup public ICT access points through national libraries and CLDC networks
	ICT in education: Development and deployment of ICT services and support, Strengthening education managementthrough the use of ICT, Review and development curriculum and content in ICT for VETs and schools, etc., Review, development and implement of training in ICT. Setup computers labs in colleges and VETs, ICT in secondary and primary schools
Non-Focal Sector	
Governance **(€9 million)**	Support to the Performance management system, Office of the Prime Minister

Under EDF11 (2014 - 2020) Namibia is allocated €68 million with focal areas including Education (including pre-primary, early childhood and vocational); Rural Development.

12.2.1.1 Framework Programme 7

The Ministry of Education, Directorate of Research, Science, Technology and Innovation is a beneficiary of the IST-Africa Initiative since 2007. IST-Africa is the first FP7 project in which Namibia is involved. The IST-Africa Initiative instigated the Africa4All Parliamentary Initiative in which the Parliament of Namibia was a beneficiary. Namibia's participants in the Framework Programme have

increased after hosting IST-Africa 2008 in Windhoek. The National Commission on Research, Science and Technology (NCRST) is now responsible for IST-Africa activities.

Participation in IST-Africa facilitated MoE to host an IST-Africa FP7 Training Workshop in Windhoek focused on FP7-ICT and FP7-Africa2010 Calls for Proposals and NCRST to host a Stakeholder Meeting in Windhoek in November 2013 focused on Horizon 2020. National Commission on Research, Science and Technology is also raising awareness of the potential of Living Labs in Namibia.

Namibia successfully secured participation in **11** FP7 projects in ICT (4 projects), Environment (1 project), Health (1 project), INCO (1 project), Infrastructure (1 project), Food, Agriculture and Biotechnology KBBE (2 projects) and Science in Society (1 project).

12.2.1.2   Horizon 2020

As part of its ongoing IST-Africa activities MoE / National Commission on Research, Science and Technology circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has undertaken an initial mapping of research expertise. The National Commission on Research, Science and Technology hosted an IST-Africa Horizon 2020 Workshop in November 2013 and a second IST-Africa Horizon 2020 Training Workshop focused specifically on the ICT-39-2017 Call in October 2016. It is working with the universities to encourage the institutions to gradually transform from primarily teaching institutions to research and innovation engines to drive socio-economic development.

Up to September 2018, Namibian organisations have been involved in 7 Horizon 2020 projects with research funding in excess of €580,000 across a number of thematic areas:

➢ SOCIETY, H2020-INT-INCO-2014 - **RINEA** (National Commission for Research Science and Technology)

➢ H2020-MSCA-RISE-2014 - **PARTY** (MSCA-RISE) - Polytechnic of Namibia

➢ H2020-SC5-2015-one-stage - **HiTech AlkCarb** (RIA) Geo-Africa Prospecting Services Cc; A. Speiser-Environmental Consultants Cc

➢ H2020-ICT-2016-INT - **IST-Africa 2016-2018** (CSA) - (National Commission for Research Science and Technology)

➢ H2020-INFRASUPP-2016-1 - **SEACRIFOG** (CSA) - Southern African Science Service Centre for Climate Change and Adaptive Land Management

➢ H2020-MSCA-ITN-2017 **- ANTHUSIA** (MSCA-ITN-EJD) - Legal Assistance Centre

➢ H2020-MSCA-ITN-2017 - **POEM (**MSCA-ITN-ETN) - Namibia University of Science and Technology

12.2.1.3   Africa4All Parliamentary Initiative[41]

Through the IST-Africa Initiative, the Parliament of Namibia was included in the Africa4All Parliamentary Initiative, which was funded under the @CP-ICT Call. The timing of the Parliament's participation was well aligned with its goal to move towards new working methods leveraging ICT.

Target Countries: Eastern and Southern Africa with pilots in Kenya, Tanzania, Uganda, Lesotho, Namibia

Main partner: Gov2u

Partner in Namibia: National Assembly of Namibia

Funding: €410,000 from EDF9 (@CP-ICT capacity-building programme) 2009-2011

12.2.1.4   TACIT[42]: Tackling Aids and Tuberculosis through Communication and Information Technologies

Target Countries: Southern and Eastern Africa, pilots in Kenya, Zambia, Uganda and Namibia

Main partner: International HIV/Aids Alliance

Funding: €960,000 from EDF9 (@CP-ICT capacity-building programme) 2009-2011

12.2.2   Finland

The Southern African Innovation Support Programme (SAIS)[43] focused on supporting a regional innovation system in SADC and promoting collaboration in relation to innovation systems between Botswana, Mozambique, Namibia and Zambia. The Namibia Business Innovation Centre (NBIC) was the Namibian partner and the initial Programme was launched in Windhoek on 13 May 2011.

Partners: Namibia Business Innovation Centre (NBIC), Botswana Innovation Hub (BIH), National Technology Business Centre, Zambia and Mozambique ICT Institute (MICTI)

Funding: €6.2 million Ministry of Foreign Affairs Finland 2011 – 2015

Southern Africa Innovation Support Programme (SAIS 2)

A follow on project, SAIS 2 is focused on supporting the growth of new businesses through strengthening innovation ecosystems and promotion of cross-border collaboration between innovation players in Southern Africa. It is supported by the Ministry for Foreign Affairs (MFA) of Finland, in partnership with the Ministry of Infrastructure, Science and Technology, Botswana; Ministry of Higher Education, Training and Innovation (Namibia); Ministry of Education, Science and Technology, Tanzania; Ministry of Higher Education, Zambia; Department of Science and Technology, South Africa and the Southern African Development Community (SADC) Secretariat. It is supporting Sustainable Development Goals 4, 8, 9 and 17. It is focused on supporting institutional

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[41] http://www.africa4all-project.eu/
[42] http://www.aidsalliance.org/newsdetails.aspx?id=242
[43] www.saisprogramme.com

capacity to support innovation and enterprise development, improved enterprise capacity to innovate and enter new markets and an improved enabling environment to support inclusive innovation activities in the region.

SAIS2 is managed by a Programme Management office, hosted by NCRST in Namibia and implemented by focal points in Botswana, Namibia, South Africa, Tanzania and Zambia.

The SAIS2 Innovation fund publishes competitive Calls for proposals to award grants for locally implemented projects in the five partner countries. The first Call for Proposals ran from February to April 2018 with three funding opportunities focused on cross border projects to support development o f institutional capacity for regional innovation cooperation; Scaling Enterprises through stronger Innovation Support organisations and Improving enabling environment for inclusive activities in the region. Four projects were selected for funding under each funding windows with twelve projects funded in total. The second Call for Proposals runs from November 2018 to January 2019.

SAIS 2 aims to support three capacity building programs for Innovation Fund grantees: Data Collection and Analytics Framework Training; Accelerator Programme for Entrepreneurs and Innovation Intermediaries and Inclusive Innovation and Capacity Building Program.

SAIS2 supported Connected Hubs to share best practices in innovation support through online and offline training sessions. In 2018 it organised the Annual Southern Africa Innovation Forum. Connected Hub Members during 2018 included Botswana Innovation Hub, Gen BW; National Commission on Research Science and Technology, Namibia; Namibia Business Innovation Institute; COSTECH, Tanzania; BuniHub, Tanzania; Technology Innovation Agency, South Africa; mLab, Southern Africa; National Technology Business Centre, Zambia and BongoHive, Zambia.

National Focal Points: Botswana Innovation Hub (BIH), National Commission on Research Science and Technology Namibia (NCRST), Technology Innovation Agency, South Africa; COSTECH, Tanzania; National Technology Business Centre, Zambia

Funding: €9.3 million, Ministry of Foreign Affairs Finland 2017 - 2021

12.2.3 Germany

ict@innovation[44] focused on building capacities in African Small and Medium sized ICT enterprises in relation to using Free and Open Source Software (FOSS) by spreading FOSS business models for enterprises in Africa, fostering FOSS certification and supporting innovative local FOSS applications for social and economic development.

Target Countries: Eastern and Southern Africa (Kenya, Malawi, Mozambique, Rwanda, South Africa, Tanzania, Uganda, Ethiopia, Namibia, Zambia)

Main partners: Partnership of FOSSFA (Free Software and Open Source Foundation for Africa) and InWEnt - Capacity Building International on behalf on behalf of German Federal Ministry of Economic Cooperation (BMZ), the Open Society Initiative for Southern Africa (OSISA).

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[44] http://www.ict-innovation.fossfa.net/

Funding: €1.6 million from German Federal Ministry of Economic Cooperation (BMZ), 2008 – 2010 first phase

12.2.4 India

The Government of Namibia signed a project agreement with the Government of India in 2009 for the establishment of a Pan African e-Network that provides specialist e-health, quality tertiary level e-education and VVIP direct connectivity to Namibia. Significant progress has been achieved with project implementation of the e-education centre. The e-health centre at the Windhoek Central Hospital has been equipped with VSAT connectivity and the virtual doctor's rooms as well as a continuous medical training studio are nearing completion.

13.   SENEGAL

13.1   Introduction

Senegal is the most advanced Western African country along the Atlantic Ocean, with major sea and air routes to Europe, other African countries and the Americas.

Covering an area of 196,722 km², it is bordered on the north by Mauritania, east by Mali, south by Guinea and Guinea Bissau, west of the Gambia and a coastline along the Atlantic Ocean for 500 km. Senegal is a flat country with sandy soil not exceeding 130m except at the south-eastern border of Republic of Guinea. Three rivers cross the country from east to west: Senegal (1700 km) north, Gambia (750 km) and Casamance (300 km) south. Senegal consists of 14 administrative regions: Dakar, Diourbel, Fatick, Kaffrine, Kaolack, Kedougou, Kolda, Louga, Matam, Saint-Louis, Sedhiou, Tambacounda, Thies and Ziguinchor. The population as at June 2018 was estimated at 15.02 million inhabitants, with a literacy rate of 57.7% (CIA World Factbook). Fifty-five percent of the total population is between 15 and 64 years of age. Dakar (550 km²), the capital, is a peninsula in the far West with a population of 3.632 million (ARTP Report 2018). The official language is French, with English being used in business. The national languages include Diola, Malinke, the Pular, Serer, Soninke and Wolof.

There is a good Policy Framework in place to address Electronic Transactions, Cybercrime and Data Protection. A National Strategy for developing ICT was defined in 2000 with the State Information Technology Agency (ADIE) created in 2004. The Science Technology and Innovation Policy is under development. In terms of eInfrastructure there are links to three submarine cables, all regions are connected via fibre optic, the national backbone is under construction and SnREN (National Research and Education Network) is supporting HEIs. ICT Initiatives are focused on eGovernment, Digital Divide, Research, eInfastructures, Entrepreneurship and eEducation. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

Senegal has a good telecommunication infrastructure and Internet access is cheaper than in other African countries. According to figures published by L'Autorite de Regulation des Telecommunications et des Postes (ARTP), as at 30 September 2018 there were 299,774fixed phone lines (292,468 in March 2018) and 16,403million phones subscriptions (15,984,934 million in March 2018). There were 10.447 million Internet subscribers as at September 2018 compared with 9.354 million in September 2017. The major of Internet users are mobile Internet users (2G & 3G)

with 17,961 fixed internet lines, 130,612 ADSL lines and 115.978 mobile internet key users as at September 2018.

Senegal has a good research base with six public Universities (3 more being created), 7 private Universities, 5 public Higher Education Institutions and 141 private Higher Education Institutions.

13.2 Bilateral & Multilateral Cooperation

Senegal enjoys bilateral relations with a number of European Member States, including France, Belgium, Spain, Italy and Germany, each of which has a slightly different focus to their engagement. Belgian international cooperation is focused on poverty reduction and in particular improving the well being of the rural population. Spanish Cooperation works with sectors including education, health, vocational training, environment or gender equity. Italy is primarily focused on agriculture and rural development, food security and protection of child rights in collaboration with UN agencies. German cooperation is now primarily focused on Renewable Energy and Energy Efficiency.

Support for ICT and Innovation related activities is primarily from European Commission, China, France, Germany, India, Switzerland, South Korea and World Bank.

13.2.1   European Commission

Under EDF10 (2008 – 2013), 317 million euro was allocated with the focal areas including Trade/Regional Integration, Sanitation.

Under EDF11 (2014 - 2020) Senegal is allocated €347 million with focal areas including Democratic Governance, Sustainable Agriculture and Food Security, Water and Sanitation.

Table 8 below provides insights into the EDF10 projects that included ICT components.

Table 8: ICT-related components within EDF10 Projects Funded in Senegal

Project Title	Sector	Total Budget	% of budget for ICT components	Budget for ICT Components	Timeframe
Projet d'appui à la modernisation de l'état civil	Government and Civil Society	€5 million	40%	€2 million	2012-2017
Bases de données urbaines	Construction	€900,000	25%	€225,000	2010-2014
Projet d'appui à la réforme du foncier urbain	Construction	€7 million	25%	€1.75 million	2011-2012
Appui de l'Union européenne à l'Assemblée Nationale au Sénégal	Government and Civil Society	€800,000	15%	€120,000	2013-2015
Projet Fichier Unifié des Données du personnel de l'Etat (FUDPE)	Government and Civil Society	€659,469	70%	€461,628	2012-2014
Projet de gestion intégrée des zones côtières (GIZC)	Environmental Protection	€4 million	15%	€600,000	2010-2015
Appui aux marchés publics	Soutien budgétaire	€1.5 million	28%	€420,000	2010-2011

13.2.1.1 Framework Programme 7

Ministère de l'Enseignement Supérieur et de la Recherche, Senegal is a beneficiary of the IST-Africa Initiative since 2009.

Participation in IST-Africa facilitated MESR to host an IST-Africa FP7 Training Workshop in Dakar focused on FP7-ICT in November 2010 and raise awareness of the opportunities for participation in international research projects with the wider research community. MESR is encouraging the take-up of Living Lab methodologies in Senegal.

Senegal successfully secured participation in **41** FP7 projects with research funding in the region of **€5.3 million:** ICT (7 projects), INCO (3 projects), Infrastructures (1 project), Environment (9 instead of 7 projects), Health (5 projects), Food, Agriculture and Biotechnology KBBE (9 projects), IDEAS (1 project), People (1 project), Space (1 project) and Social Sciences (4 projects).

13.2.1.2 Horizon 2020

As part of its ongoing IST-Africa activities MESR has undertaken a mapping of expertise and circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings.

Up to September 2018, Senegal has been involved in 22 Horizon 2020 projects with research funding in excess of €2.78 million across a range of thematic areas:

➢ LEIT-SPACE, H2020-Galileo-2014-1 - **MAGNIFIC** (Agence pour la Securite de la Navigation Aerienne en Afrique et a Madagascar)

➢ FOOD, H2020-SFS-2014-1 - **PROIntensAfrica** (Conf. Respons. Recher. Agronom.Afriq. de L'Ouest & du Centre)

➢ HEALTH, H2020-Adhoc-2014-20 - **REACTION** (Universite Cheikh Anta Diop de Dakar)

➢ LEIT - ICT-39-2015 **- WAZIUP** (Uni of Gaston Bergeg de Saint Louis, CODER4Africa, CTIC Dakar)

➢ H2020-Galileo-2015-1 - **GRICAS** (Agence Pour la Securite de la Navigation Aerienne en Afrique et a Madagascar)

➢ H2020-INT-SOCIETY-2015 - **EUNPACK** (Alliance pour Refonder la Gouvernance en Afrique Arga)

➢ H2020-ICT-2016-INT - **IST-Africa 2016-2018** (Ministere de la Recherche Scientifique)

➢ H2020-SC1-2016-RTD-Zika **- ZikaPLAN** (Institut Pasteur de Dakar); **ZIKAlliance** (Institut Pasteur de Dakar)

➢ H2020-SFS-2016-1 - **LEAP-AGRI** (Ministere de la Recherche Scientifique)

➢ H2020-INFRAIA-2016-1 - **INFRAVEC2** (Institut Pasteur de Dakar)

➢ H2020-JTI-IMI2-2014-02-single-stage - **EbolaMoDRAD** (Institut Pasteur de Dakar)

➢ H2020-MSCA-RISE-2015 - **DEMOSTAF** (MSCA-RISE) - Agence Nationale de la Statistique et de la Demographie; Universite Assane Seck de Ziguinchor; Universite Cheikh Anta Diop de Dakar

➢ H2020-SFS-2016-2 - **FarFish** (RIA) - Conservation and Research of West African Aquatic Mammals (Corewam); Institut Senegalais de Recherches Agricoles

➢ H2020-SFS-2016-2 - **PALE-Blu (**RIA) - Institut Senegalais de Recherches Agricoles

➢ H2020-MSCA-RISE-2016 - **SLAFNET** (MSCA-RISE) - Univeriste Cheikh Anta Diop de Dakar

➢ H2020-MSCA-RISE-2016 - Iucn - **PADDLE** (MSCA-RISE) - Senegal and Universite Cheikh Anta Diop De Dakar

➢ H2020-GALILEO-GSA-2017-1 - **GRIMASSE** (IA) - Agence pour la Securite de la Navigation Aerienne en Afrique et a Madagascar

➢ H2020-EO-2017 - **NADiRA** (IA) - Manobi Senegal - SA

➢ H2020-ICT-2017-1 (ICT-39-2017)- **WAZIHUB** (IA) - Sonatel - Sa; Universite Gaston Berger de Saint Louis

➢ H2020-LC-SC3-2018-Joint-Actions-1 - **PRE-LEAP-RE** (CSA) -Agence Nationale pour les Energies Renouvelables

➢ H2020-SFS-2018-1 - **LEAP4FNSSA** (CSA) - Ministere de la Recherche Scientifique

13.2.2   France

After more than three centuries, France and Senegal have remained very close since the independence of nations. A shared history, a tradition of cooperation in all fields, a stream of constant human and material exchanges in both directions, support this cooperation.

France supports the strategy for achieving the Millennium goals for Senegal, focusing primarily in three key sectors: education, the productive sector and infrastructure.

13.2.2.1   SIST project[45]

This project involved the establishment of an Information System Science and Technology web platform receiving all research records, thesis and publications of Senegal. The portal went live on 30 March 2008.

Funding: €50,000

13.2.2.1   Démarches administratives project[46]

The main purpose of this web site was to make reliable administrative information (legal, consistent and updated) accessible to a majority of users, individuals and professionals in a simple and

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[45] www.sist.sn
[46] http://www.demarches.gouv.sn/

structured manner according to their requirements. The web site then directs users to appropriate services.

13.2.3   Switzerland

Senegal has a limited program with the Swiss Agency for Development and Cooperation (SDC). SDC withdrew from Senegal in 2010. Actions could be maintained as part of a framework for development and regional integration. In Senegal, the commitment from Switzerland has focused primarily on rural development from the late 70s, and Information Technology and Communication. The Swiss official development assistance to Senegal was between 4 and 5 million Swiss francs per year.

13.2.3.1   *Community Multimedia Centres*

On the occasion of World Information Summit in Geneva in 2003, SDC, UNESCO and the Heads of State of Senegal, Mali and Mozambique launched Community Multimedia Centres (CMCs, with access to the Internet) in marginalized areas of the country. These centers are designed to meet the needs of local people in terms of access and exchange information in their own language. They include a radio transmitter, computers for Internet browsing and also offer business services such as telephone, fax and email services. The first phase saw the creation of 24 CMCs in Senegal, including 20 with Swiss funds. Switzerland also provided funds to the second phase. One of the challenges is to ensure better production and distribution of content. There are currently 30 centres functioning in Senegal.

13.2.3.2   *CoseLearn*

The CoseLearn project, funded by SDC, also emerged after the World Summit on Information at Geneva. This project involved the gradual introduction of Virtual Campus Regional involving several countries in Francophone Africa, training in forty universities including the University Cheikh Anta Diop in Dakar, nearly 170 experts worked to train specialists and to contribute to content creation, training of nearly 500 specialists in teaching and technical support and building a large catalogue of several hundred modules of courses and several projects pilots involving several thousand students. This ambitious project is under implementation with the assistance of national steering groups. The project is ongoing with over nineteen courses from University Cheikh Anta Diop.

13.2.4   India

The Hub Earth Station infrastructure is designed to provide online services, distance learning and telemedicine remote. This ongoing project aims at interconnecting 53 learning centres, 53 hospitals, 5 regional universities and 5 regional hospitals

Main partners: India

Funding: $40 million

13.2.5   Government Intranet

The Government Intranet project commenced in 2004 and provides a network that covers almost all the departments and wires 665 buildings (office buildings, city halls, hospitals, etc.)

Main partners: World Bank, China, Korea

Funding: $75 million

14. REPUBLIC OF SOUTH AFRICA

14.1 Introduction

The Republic of South Africa occupies the southernmost part of the African continent, stretching latitudinally from 22° to 35° south and longitudinally from 17° to 33° east, flanked on the west by the Atlantic Ocean and on the east by the Indian Ocean, whose waters meet at the country's most southern tip, Cape Agulhas. South Africa has common boundaries with Namibia, Botswana and Zimbabwe, while Mozambique and Eswatini lie to the north-east. The Kingdom of Lesotho is completely enclosed by South African territory in the south-east.

South Africa has a surface area of 1,219,909 sq km, made up of nine provinces (Western Cape, the Eastern Cape, KwaZulu-Natal, the Northern Cape, Free State, North West, Gauteng, Mpumalanga and Limpopo), each with its own legislature, premier and executive councils.

According to the 2018 Statistics South Africa Mid-year Report,, South Africa has an estimated population of 57.73million, About 29.5% of the population is aged younger than 15 years and approximately 8,5% (4,89 million) is 60 years or older. South Africa spends 5.9% of GDP on education (2016). The literacy rate is estimated at 94.4% (2018).. Pretoria, the capital city has a population of 2.37 million, Johannesburg (inlcuding Ekurhuleni) 9.227 million, Durban 2.378 million and Cape Town 4.43 million (2018, CIA World Factbook).

There is a good Policy Framework including the ICT Policy Review White Paper (2017), National e-Government Strategy and Roadmap (2018), Broadband Policy (2013), ICT RDI Implementation Roadmap (2013) and National CyberSecurity Policy Framework (2012). eInfrastructure for research is well developed with TENET (Tertiary Education and Research Network of South Africa) operating the South African National Research Network ("SANReN"), which comprises of a national backbone, several metropolitan rings, and some dedicated long-haul circuits to connect specific research installations. TENET provides Internet and related services to around 217 sites. ICT Initiatives focus on eInfrastructure, Digital/Broadband Access, eSkills, Smartcard ID and 5G trials. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

In relation to communications, total fixed-line telephone subscriptions are estimated to be 3,629,141 (2017). Total mobile telephone subscriptions are estimated to be 91,878,275. The mobile-cellular tele density exceeds 168 per 100 persons (2017, CIA World Factbook). Combined fixed-line and mobile-cellular tele density exceeds 145 telephones per 100 persons;

consists of carrier-equipped open-wire lines, coaxial cables, microwave radio relay links, fibre-optic cable, radiotelephone communication stations, and wireless local loops; key centers are Bloemfontein, Cape Town, Durban, Johannesburg, Port Elizabeth, and Pretoria (2016).

South Africa has a vibrant, well-developed research community and a good track record in collaborative research with 26 state-funded tertiary institutions (Universities & Universities of Technology) and 87 private institutions of Higher Education.

14.2 Bilateral & Multilateral Cooperation

South Africa enjoys strong bilateral relations with a number of European countries.

Support for ICT and Innovation related activities is primarily from European Commission (FP7, H2020, MIP), Finland, France, Italy and Germany. France and Italy support bilateral research projects. Germany provided support to the regional ict@innovation Open Source Project.

14.2.1 European Commission

Under the Multi-Annual Indicative Programme (MIP) for 2007 - 2013 South Africa was allocated €980 million with the focal areas including Employment Creation; Capacity Development for Service Delivery and Social Cohesion and Governance.

Under MIP (2014 - 2020) South Africa is allocated €241 million with focal areas including Employment Creation; Education, Training and Innovation; Building a Capable and Developmental State. Sector Budget Support and General Budget Support both provide support to policy and government service delivery programme, both supported through targeted science and technology innovation projects. Table 9 below provides insights in ICT and Innovation related projects being funded.

Table 9: ICT-related Projects funded under MIP in South Africa

No	Programme	Projects/Activity	Amount (Euros)	Status	Remark
1	EU Government Budget Support (GBS) - ICT Innovation Programme to support development and improved government service delivery	Mobile internet protocol television (IPTV), accesses through a cell phone network and has ability to create new players in the local film and broadcasting industry.	The total amount allocated to the EU GBS - ICT Innovation Programme for 2015 - 2017 is €8.8 million	The phase of the project funded under EU GBS-ICT Innovation Programme ended.	Currently the Department of Science and Technology (DST) is funding further R&D work of this technology. The Department of Communications has interest in supporting SMMEs to create services based on this technology.

2		mHealth integration platform, jointly developed with the Department of Health as a building block to the National Health Insurance system.		The phase of the project funded under EU GBS-ICT Innovation Programme ended.	The system has the capability to integrate information from all spheres of government and improve document management.
3		Speech-enabled multilingual services delivery platform that can integrate information received from all 11 official languages in South Africa.		The phase of the project funded under EU GBS-ICT Innovation Programme ended.	The aim was to utilise this technology at government services delivery points to get un-bias feedback on services delivered.
4		Multi-Hazard Early warning field terminal information system at local municipalities.		The phase of the project funded under EU GBS-ICT Innovation Programme ended.	The initial focus of deployment was in provinces of North West, Mpumalanga, Limpopo and KwaZulu-Natal.
5		Development of the Optical tomography-based fingerprint reader prototype.		The phase of the project funded under EU GBS-ICT Innovation Programme ended.	The work was done in partnership with the South African cyber security community, government agencies and the Departments of Home Affairs, and the South African Social Security Agency (SASSA). The DST is currently funding the development of other systems that are based on the technology (IP) developed from the EU-BGBS – funded project, e.g. the Latent Fingerprint Acquisition System Minimum Viable Product.

6	EU Sector Budget Support - Innovation for Poverty Alleviation	Broadband4All / Wireless Mesh Network technology demonstrator project.	R 86.2 million	The pilot phase was between 2009-2014. Currently the project is in the commercialisation stage where some private entities have taken over certain aspects of it.	The project had the objective of demonstrating alternative business models to deploying communications infrastructure in rural areas.
7		Rollout of the Digital Doorways		Finished in 2013.	The aim was to provide people in rural and disadvantaged areas with freely accessible computer equipment and open source software, enabling them to experiment and learn without formal training and with minimal external input.

Through UbuntuNet Alliance and TENET, South Africa is a beneficiary of the AfricaConnect and AfricaConnect 2 eInfrastructure projects co-funded under EDF10 and EDF11.

14.2.1.1   Framework Programme 7

The Department of Science and Technology South Africa is a beneficiary of the IST-Africa Initiative since 2007. DST also runs the ESASTAP Programme to encourage take up of opportunities under the Framework Programme in South Africa and is a beneficiary of CAAST-Net & CAAST-Net Plus.

South Africa secured participation in **193** projects with research funding in excess of **€37.3 million** under FP7: ICT (19 projects), INCO (10 projects), Energy (5 projects), Environment (28 projects), EURATOM-FISSION (5 projects), Health (31 projects), Infrastructure (11 projects), Food, Agriculture and Biotechnology KBBE (32 projects), NMP (3 projects), People (8 projects), Security (2 projects), Science in Society (5 projects), SME (3 projects), Space (11 projects), Social Sciences (12 projects), Transport (7 projects).

14.2.1.2   Horizon 2020

Up to September 2018, South African organisations are involved in **122** Horizon 2020 projects with funding of over **€28.3** million across a range of thematic areas:

- TRANSPORT, H2020-MG-2014_TwoStages - **AEROGUST** (RIA) - University of Cape Town
- INFRA, H2020-INFRASUPP-2014-2 **B3Africa** (CSA) - Stellenbosch University & University of the Western Cape
- ENV, H2020-SC5-2014-one-stage - **BioMOre** (RIA) - MINTEK
- ENV, H2020-SC5-2014-two-stage **ECOPOTENTIAL** (RIA) - Council for Scientific and Industrial Research
- LEIT-SPACE, H2020-COMPET-2014 - **EUSPACE-AWE** (CSA) - National Research Foundation
- INFRA, H2020-INFRAIA-2014-2015 - **EVAg** (RIA) - Agricultural Research Council (ARC); National Health Laboratory Services)
- ENV, H2020-WASTE-2014-one-stage - **EWIT** (CSA) - Council for Scientific and Industrial Research, E-Waste Association of South Africa, Mintek & Pikitup Johannesburg (Proprietary) Limited, Choma Municipal Council)
- ENV, H2020-SC5-2014-one-stage - **green.eu** (CSA) - Stellenbosch University; **INTRAW** (CSA) - Council for Scientific and Industrial Research
- ENV, H2020-SC5-2014-two-stage - **GREEN-WIN** (RIA) - University of Cape Town
- INFRA, H2020-INFRASUPP-2014-2 - **MAGIC** (CSA) - Council for Scientific and Industrial Research; **Sci-GaIA** (CSA) - Council for Scientific and Industrial Research
- FOOD, H2020-SFS-2014-1 - **PROIntensAfrica** (CSA) - Agricultural Research Council (ARC)
- FOOD, H2020-SFS-2014-2 - **nEUROSTRESSPEP** (RIA) - University of Cape Town
- Science with and for Society, H2020-ISSI-2014-1 - **NUCLEUS** (CSA) - National Research Foundation
- SOCIETY, H2020-INT-INCO-2014 - **RINEA** (CSA) - Department of Science and Technology
- SECURITY, H2020-DRS-2014 **- SEREN 3** (CSA) - Council for Scientific and Industrial Research
- HEALTH, H2020-PHC-2014-single-stage **- TBVAC2020** (RIA) - Kwazulu Natal Research Institute for TB-HIV (K-RITH) NPC, Stellenbosch University & University of Cape Town
- Science with and for Society, H2020-GARRI-2014-1 - **TRUST** (CSA) - The South African San Institute Trust, University of Cape Town & University of the Witwatersrand Johannesburg
- HEALTH, H2020-PHC-2014-two-stage - **VIROGENESIS** (RIA) - University of Kwazulu-Natal
- ENV, H2020-WATER-2014-one-stage - **WaterWorks2014** (ERA-NET- Cofund) - Water Research Commission
- FOOD, H2020-BG-2014-2 - **AtlantOS (**RIA) - Council for Scientific and Industrial Research
- HEALTH, H2020-HCO-2014 **- SMART2D** (RIA) - University of The Western Cape
- LEIT - ICT-39-2015- **mHealth4Afrika** (RIA) - Nelson Mandela University

- H2020-WATER-2015-one-stage - **AfriAlliance** (CSA) Iclei - Local Governments for Sustainability - Africa; Water Research Commission; Council for Scientific and Industrial Research

- H2020-INFRADEV-1-2015-1 - **IN-SKA** (RIA) - National Research Foundation

- H2020-SC5-2015-one-stage - **INTMET** (RIA) - Mintek

- H2020-INT-SOCIETY-2015 - **GLOBUS** (RIA) University of the Witwatersrand Johannesburg

- H2020-NMP-ERA-NET-2015 - **M-ERA.NET 2** (ERA-NET-Cofund) - Department of Science and Technology

- H2020-SC5-2015-one-stage- **STRADE** (CSA) - University of the Witwatersrand Johannesburg; Dmt-Kai Batla Pty Ltd

- ERA-NET-Cofund - **WaterWorks2015** (ERA-NET-Cofund) - Water Research Commission

- H2020-LCE-2015-1-two-stage - **MinWaterCSP** (RIA) - Notus Fan Engineering; Stellenbosch University; Kelvion Thermal Solutions (Pty) Ltd

- H2020-WATER-2015-one-stage - **FERTINNOWA** (CSA) - Optima Agrik Pty Ltd

- H2020-Adhoc-2014-20 - **ICRI 2016** (CSA) - Department of Science and Technology

- H2020-DS-2015-1 **- FutureTrust** (IA) - Law Trusted Third Party Services Pty Ltd

- H2020-WATER-2015-two-stage - **WATERSPOUTT** (RIA) - Stellenbosch University; **SafeWaterAfrica** (RIA) - Tshwane University of Technology; Council for Scientific and Industrial Research; Advance Call Pty Ltd; Virtual Consulting Engineers Vce; Stellenbosch University

- H2020-NMP-2015-two-stage - **caLIBRAte** (RIA) - National Health Laboratory Services

- H2020-INT-INCO-2015 - **ESASTAP 2020** (CSA) - Academy of Science of South Africa; National Research Foundation; Technology Innovation Agency; Department of Science and Technology

- H2020-ICT-2016-INT - **IST-Africa 2016-2018** (CSA)- Department of Science and Technology

- H2020-BG-2016-1 - **MarTERA** (ERA-NET-Cofund) - Department of Science and Technology

- H2020-SC5-2016-OneStageB - **COP21 RIPPLES** (RIA) - University of Cape Town

- H2020-EO-2016 - **CyanAlert** (IA) - Cyanolakes (Pty) Ltd

- H2020-SC5-2016-OneStageB - **ERA-MIN 2** (ERA-NET-Cofund) - Department of Science and Technology

- H2020-INFRASUPP-2016-1 - **AENEAS** (RIA) - Council for Scientific and Industrial Research; University of Cape Town; National Research Foundation

- H2020-INFRADEV-2016-1 - **JUMPING JIVE** (CSA) - Department of Science and Technology; **RINGO** (CSA) - University of the Witwatersrand Johannesburg

- H2020-SC1-2016-RTD - **SPICES** (RIA) - University of Limpopo; **anTBiotic** (RIA) - Task Foundation Npc; University of Cape Town)

- H2020-INFRAIA-2016-1 - **RadioNet** (RIA) - Department of Science and Technology
- H2020-FOF-2016 - **4D hybrid** (RIA) - Council for Scientific and Industrial Research
- H2020-SFS-2016-1 - **LEAP-AGRI** (ERA-NET-Cofund) - National Research Foundation; Department of Science and Technology
- H2020-INFRASUPP-2016-1 - **SEACRIFOG** (CSA) - University of the Witwatersrand Johannesburg; National Research Foundation
- H2020-SC5-2016-OneStageB **- ITERAMS** (RIA) - University of Cape Town
- H2020-SwafS-2016-1 - **SIENNA** (CSA) - University of Cape Town
- H2020-SFS-2016-2 - **TROPICSAFE** (RIA) - Patho Solutions (Pty) Ltd; Vinpro; Stellenbosch University; University of Pretoria)
- H2020-MSCA-RISE-2014 **- CREATe-Network** (MSCA-RISE) - Council for Scientific and Industrial Research
- H2020-MSCA-RISE-2014 - **EVE** (MSCA-RISE) - Armaments Corporation of South Africa; Esteq Engineering (Pty) Ltd; University of Pretoria
- H2020-MSCA-RISE-2014 - **GreenBubbles** (MSCA-RISE) - Noordwes-Universiteit; Divers Alert Network Southern Africa
- H2020-MSCA-RISE-2014 **- MAT4TREAT** (MSCA-RISE) - Stellenbosch University
- H2020-MSCA-ITN-2014 - **SAF21** (MSCA-ITN-ETN) - South African Association for Marine Biological Research
- H2020-MSCA-RISE-2014 - **Sustain-Owner** (MSCA-RISE) - University of Pretoria
- H2020-MSCA-RISE-2014 - **PARTY** (MSCA-RISE)Cape Peninsula University of Technology; The South African san Institute Trust
- H2020-MSCA-RISE-2014 - **FlyHigh** (MSCA-RISE) - Agri Protein Technologies (Pty) Ltd
- H2020-MSCA-IF-2014 - **WORMTUMORS** (MSCA-IF-GF) - University of Cape Town
- H2020-MSCA-RISE-2015 - **Ocean Medicines** (MSCA-RISE) - University of the Western Cape
- H2020-MSCA-RISE-2015 - **FAB-MOVE** (MSCA-RISE) - University of the Western Cape
- H2020-MSCA-RISE-2015 **- MediHealth** (MSCA-RISE) - Tshwane University of Technology
- H2020-MSCA-RISE-2015 **- MIREL** (MSCA-RISE) - University of Cape Town
- H2020-MSCA-RISE-2015 - **PEARL** (MSCA-RISE) - University of Johannesburg
- H2020-MSCA-RISE-2015 **- RUBICON** (MSCA-RISE)University of Cape Town
- H2020-MSCA-RISE-2015 - **SOLIRING** (MSCA-RISE) - University of Cape Town
- H2020-MSCA-IF-2014 - **NEARCONTROL** (MSCA-IF-GF) - University of Kwazulu-Natal
- H2020-MSCA-RISE-2014 **- Muscle stress relief** (MSCA-RISE) - Stellenbosch University
- H2020-MSCA-RISE-2015 - **SYSMICS** (MSCA-RISE) - University of the Witwatersrand Johannesburg

- H2020-MSCA-RISE-2015 - **GEMCLIME** (MSCA-RISE) - University of Cape Town
- H2020-BBI-PPP-2015-2-1 - **TECH4EFFECT** (BBI-RIA) - Stellenbosch University
- H2020-MSCA-ITN-2016 - **BioCapture** (MSCA-ITN-ETN) - ReSyn Biosciences
- H2020-EO-2016 - **CyanoAlert** (IA) - Cyanolakes (Pty) Ltd
- H2020-Msca-Rise-2016 - **INTERWASTE** (MSCA-RISE) - Tshwane University of Technology; University of Kwazulu-Natal
- H2020-MSCA-RISE-2016 - **VirFree** (MSCA-RISE) - University of Pretoria
- H2020-MSCA-COFUND-2015 - **WIRL** (MSCA-COFUND-FP) - African Arts Institute
- H2020-MSCA-RISE-2016 - **CID** (MSCA-RISE) - University of South Africa
- H2020-MSCA-COFUND-2016 - **SPARK** (MSCA-COFUND-DP) - South African Institute for Aquatic Biodiversity
- H2020-MSCA-RISE-2016 - **TICASS** (MSCA-RISE) - University of the Witwatersrand Johannesburg
- ERC-2016-COG **- Honeyguides-Humans** (ERC-COG) - University of Cape Town
- H2020-SFS-2016-2 **- InnovAfrica** (RIA) - Agricultural Research Council (ARC)
- H2020-SFS-2017-1 - **AfriCultuReS** (RIA) - South Africa National Space Agency
- H2020-SFS-2017-1 - **CIRCASA** (CSA) - Agricultural Research Council (ARC)
- H2020-SC5-2017-OneStageB **- INFACT (**RIA) - GALSA (PTY) LTD
- H2020-MSCA-RISE-2017 **- INFINITE-CELL** (MSCA-RISE) - University of the Western Cape
- H2020-COMPET-2017 - **TechTIDE** (RIA) - South Africa National Space Agency
- H2020-MSCA-RISE-2017 - **HYDRIDE4MOBILITY** (MSCA-RISE) - TR Design; University of the Western Cape; Impala Platinum
- H2020-Msca-Rise-2017 - **ThermaSMART** (MSCA-RISE) - University of Pretoria
- H2020-MSCA-ITN-2017 - **ANTHUSIA** (MSCA-ITN-EJD) - Abahlali baseMjondolo Movement; Centre for Development and Enterprise; Southern Africa Labour and Development Unity; Wits School of Governance
- H2020-MSCA-RISE-2017 - **BIODEST** (MSCA-RISE) - Stellenbosch University
- H2020-MSCA-RISE-2017 - **CARE4C** (MSCA-RISE) - Merensky Timber (Pty) Ltd; Stellenbosch University
- H2020-SC1-2017-Single-Stage-RTD **- RISE** (RIA) - University of Cape Town
- H2020-SC5-2017-OneStageB - **WaterWorks2017** (ERA-NET-Cofund) - Water Research Commission
- H2020-SC5-2017-OneStageB - **TWIGA** (RIA) - South African Weather Service
- H2020-MSCA-RISE-2017 - **DiCoMI** (MSCA-RISE) - Vaal University of Technology
- H2020-MSCA-RISE-2017 - **CatChain** (MSCA-RISE) - Tshwane University of Technology

- ➢ H2020-SFS-2017-2 - **CO-CREATE** (RIA) - University of Cape Town

- ➢ H2020-SwafS-2017-1 - **RRING (**RIA) - National Research Foundation

- ➢ H2020-SEC-2016-2017-2 - **SEREN 4** (CSA) - Council for Scientific and Industrial Research

- ➢ H2020-ICT-2017-1 - **WAZIHUB** (IA) - Makers Be Like

- ➢ H2020-SFS-2017-2 - **DEFEND** (RIA) - Agricultural Research Council (Arc); University of Pretoria

- ➢ H2020-SC5-2017-OneStageB - **PACIFIC** (RIA) - Institute of Mine Seismology (PTY)LTD

- ➢ ERC-2016-ADG - **Group-Dynamics-TCB** (ERC-ADG) - Kalahari Research Trust

- ➢ H2020-SFS-2017-2 - **HOMED (**RIA) - University of Pretoria

- ➢ H2020-BG-2018-1 - **AANChOR** (CSA) - National Research Foundation, Council for Scientific and Industrial Research, Department of Science and Technology

- ➢ H2020-JTI-IMI2-2016-10-two-stage - **AIMS-2-TRIALS** (IMI2-RIA) - Stellenbosch University

- ➢ H2020-WATER-2015-two-stage - **DAFNE** (RIA) - University of Zambia

- ➢ H2020-ICT-2015 **DMC-MALVEC** (RIA) - Ministry of Health

- ➢ H2020-SC5-2015-two-stage - **Ground Truth 2.0** (IA) - World Wide Fund for Nature (WWF) Zambia

- ➢ H2020-SFS-2018-1 - **LEAP4FNSSA** (CSA) - National Research Foundation, Agricultural Research Council (Arc), Department of Science and Technology

- ➢ H2020-SFS-2018-1 - **MicrobiomeSupport** (CSA) - University of Pretoria

- ➢ H2020-LC-SC3-2018-Joint-Actions-1 **- PRE-LEAP-RE** (CSA) - National Research Foundation, Department of Science and Technology

- ➢ H2020-NMBP-SPIRE-2018 **- PreMa** (IA) - Stellenbosch University, Mintek, Transalloys Pty Ltd

- ➢ H2020-MSCA-RISE-2018 - **RESIST** (MSCA-RISE) - University of Cape Town

- ➢ H2020-MSCA-ITN-2018 - **ReTraCE** (MSCA-ITN-ETN) - African Circular Economy Network

- ➢ H2020-SC1-2016-RTD - **SURG-Africa** (RIA) - The Surgical Society of Zambia

- ➢ H2020-MSCA-IF-2017 - **SUSTINNO** (MSCA-IF-GF) - University of Cape Town

14.2.2 Finland

14.2.2.1   *Southern Africa Innovation Support Programme (SAIS 2)*

SAIS 2 is focused on supporting the growth of new businesses through strengthening innovation ecosystems and promotion of cross-border collaboration between innovation players in Southern Africa. It is supported by the Ministry for Foreign Affairs (MFA) of Finland, in partnership with the Ministry of Infrastructure, Science and Technology, Botswana; Ministry of Higher Education, Training and Innovation (Namibia); Ministry of Education, Science and Technology, Tanzania; Ministry of Higher Education, Zambia; Department of Science and Technology, South Africa and the Southern African Development Community (SADC) Secretariat. It is supporting Sustainable

Development Goals 4, 8, 9 and 17. It is focused on supporting institutional capacity to support innovation and enterprise development, improved enterprise capacity to innovate and enter new markets and an improved enabling environment to support inclusive innovation activities in the region.

SAIS2 is managed by a Programme Management office, hosted by NCRST in Namibia and implemented by focal points in Botswana, Namibia, South Africa, Tanzania and Zambia.

The SAIS2 Innovation fund publishes competitive Calls for proposals to award grants for locally implemented projects in the five partner countries. The first Call for Proposals ran from February to April 2018 with three funding opportunities focused on cross border projects to support development o f institutional capacity for regional innovation cooperation; Scaling Enterprises through stronger Innovation Support organisations and Improving enabling environment for inclusive activities in the region. Four projects were selected for funding under each funding windows with twelve projects funded in total. The second Call for Proposals runs from November 2018 to January 2019.

SAIS 2 aims to support three capacity building programs for Innovation Fund grantees: Data Collection and Analytics Framework Training; Accelerator Programme for Entrepreneurs and Innovation Intermediaries and Inclusive Innovation and Capacity Building Program.

SAIS2 supported Connected Hubs to share best practices in innovation support through online and offline training sessions. In 2018 it organised the Annual Southern Africa Innovation Forum. Connected Hub Members during 2018 included Botswana Innovation Hub, Gen BW; National Commission on Research Science and Technology, Namibia; Namibia Business Innovation Institute; COSTECH, Tanzania; BuniHub, Tanzania; Technology Innovation Agency, South Africa; mLab, Southern Africa; National Technology Business Centre, Zambia and BongoHive, Zambia.

National Focal Points: Botswana Innovation Hub (BIH), National Commission on Research Science and Technology Namibia (NCRST), Technology Innovation Agency, South Africa; COSTECH, Tanzania; National Technology Business Centre, Zambia

Funding: €9.3 million, Ministry of Foreign Affairs Finland 2017 - 2021

14.2.2.2   SAFIPA Programme

The SAFIPA Programme[47] (South Africa – Finland Knowledge Partnership on ICT) focused on institutional capacity building on development and deployment of ICT service applications. This programme finished at the end of September 2011.

Target County: South Africa

Main partners: Ministry for Foreign Affairs Finland (MFA), Department of Science & Technology South Africa (DST), CSIR/MERAKA Institute, private sector partners

Funding: €3 Million from MFA for 2008 - 2011

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[47] http://safipa.com/

14.2.2.3   COFISA Programme

The COFISA Programme (Cooperation Framework on Innovation Systems between Finland and South Africa) was focused on providing support for enhancing innovation systems including the use of ICT in service delivery. This programme finished at the end of 2010.

Target County: South Africa

Main partners: Ministry for Foreign Affairs Finland (MFA), Department of Science & Technology South Africa (DST), private sector partners

Funding: €3 Million from MFA for 2006 - 2010

14.2.2.4   Establishing National CSIRT Capacity for South Africa

This Programme between Finland and South Africa was focused on institutional cooperation on Information Security.

Target County: South Africa

Main partners: Ministry for Foreign Affairs Finland (MFA), Department of Science & Technology South Africa (DST), Finnish Communications Regulatory, CSIR private sector partners

Funding: €280,000 for 2009 - 2010

14.2.2.5 INSPIRE (Provincial Information Society Strategies)

The INSPIRE Programme between Finland and South Africa focused on providing technical assistance to support the development and deployment of an integrated, comprehensive and feasible Provincial Information Society Strategies.

Target County: South Africa

Main partners: Ministry for Foreign Affairs Finland (MFA), PNC on ISAD, Department of Communications (DoC) South Africa, provincial governments of Northern Cape and Limpopo

Funding: €4.07 Million for 2008 - 2010

14.2.2.6 CSBKE (Creating Sustainable Business in the Knowledge Economy)

This programme was focused on improving capacity of Sub-Saharan business incubators in mobile applications development, social networking and market deployment.

Target Countries: Southern and Eastern Africa, pilots in Tanzania, Mozambique and South Africa

Main Partners: Ministry for Foreign Affairs Finland (MFA), InfoDEV Programme, Nokia Corporation

Funding: Global programme of which €3.3 Million allocated to Africa from MFA for 2010 - 2012

14.2.3 Germany

ict@innovation[48] was focused on building capacities in African Small and Medium sized ICT enterprises in relation to using Free and Open Source Software (FOSS) by spreading FOSS

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[48] http://www.ict-innovation.fossfa.net/

business models for enterprises in Africa, fostering FOSS certification and supporting innovative local FOSS applications for social and economic development.

Target Countries: Eastern and Southern Africa (Kenya, Malawi, Mozambique, Rwanda, South Africa, Tanzania, Uganda, Ethiopia, Namibia, Zambia)

Main partners: Partnership of FOSSFA (Free Software and Open Source Foundation for Africa) and InWEnt - Capacity Building International on behalf on behalf of German Federal Ministry of Economic Cooperation (BMZ), the Open Society Initiative for Southern Africa (OSISA).

Funding: €1.6 Million from German Federal Ministry of Economic Cooperation (BMZ), 2008 – 2010 first phase

15. ESWATINI

15.1   Introduction

The Kingdom of Eswatini (formerly known as Swaziland) is a landlocked country in Southern Africa, bordered by South Africa to the North, South and West and Mozambique to the East. Eswatini consists of four administrative districts namely Hhohho, Manzini, Lubombou, and Shiselweni as shown in the map. It has a surface area of 17,363 square kms. The population is estimated at 1,087,200   million inhabitants (est July 2018 CIA World FactBook) with a literacy rate of 87.5%. 61.8 percent of the total population is between 15 and 64 years of age. Mbabane, the capital city, has a population of 68,000 (2018, CIA World Factbook). The official languages are English and Siswati. Eswatini is classified as a low middle-income developing country with a GDP per capita of US$9,600 (2014 est).
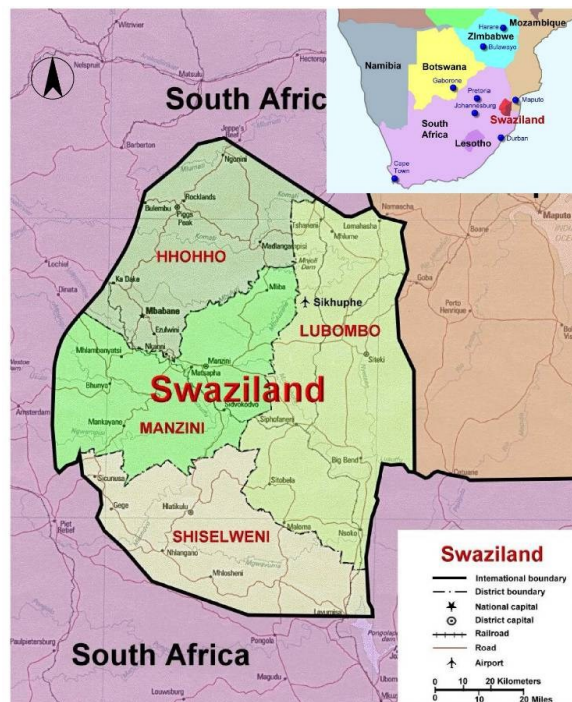
Eswatini is a Member State of the Southern African Development Community (SADC), the Common Market for Eastern and Southern Africa (COMESA. The economy of Eswatini faces serious challenges. Manufacturing and mining in general have been in decline and unemployment is rising. Outside of agriculture, there are relatively few prospects for the significant numbers of young job-seekers entering the labour market.

There is a good policy infrastructure focused on the adoption of ICT to support socio-economic development (ICT Policy 2004, National Information and Communication Infrastructure Policy 2006, Science Technology and Innovation Policy 2012 and Swaziland Communications Commission Act 2013). eInfrastructure is gradually improving with a fibre optic backbone network, IXP established in 2014, connection to two submarine cables through Mozambique and South Africa and free internet access in schools and hospitals through ITU. ICT Initiatives are primarily focused on eGovernemnt and development of the Science and Technology Park with funding from Taiwan. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

Eswatini has 80% mobile penetration and 28.6% Internet penetration (July 2016).

Eswatini is gradually increasing the focus on research with one public University (the University of Eswatini) and four private Higher Education institutions (the Southern Nazarene University,

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Limkokwing University and the Christian Medical University, which opened in August 2013 and Amadi.)

15.2 Bilateral & Multilateral Cooperation

Overseas Development Assistance for Eswatini comes mainly from the African Development Bank, European Union (EU Delegation), Japan (JICA), Republic of China/Taiwan, the traditional UN institutions (UNESCO, UNDP, UNICEF, WHO, and WFP), United States (USAID, Global Fund), the World Bank and the Import Export Bank of India (EXIM Bank of India).

The table below summarises the main areas where each donor is currently focused:

NAME OF COOPERATING PARTNER	AREA OF ASSISTANCE
African Development Bank	Water, Agriculture, Infrastructure
European Union	Education and Training, Health, Water and sanitation, Agriculture, infrastructure, Social protection, Governance, Capacity Building
Japan (JICA)	Education and Training, Health, Water and Sanitation, Agriculture.
Republic of China/Taiwan	Education and Training, Health, Water and Sanitation, Agriculture, Infrastructure, Commerce Industry and Trade, Governance, Science and Technology, ICT
UNESCO, UNDP, UNICEF, WHO, and WFP	Education and Training, Health, Water and Sanitation, Agriculture, Governance, Science and Technology
USAID	Water and Sanitation, Commerce industry and Trade, Public Order and Safety, Housing and Community Development
Global Fund	Health
The World Bank	Health, Social protection, Governance
Import Export Bank of India (EXIM Bank of India)	Education and Training, Agriculture, Science and Technology

Support for ICT and Innovation related activities is currently primarily from the European Commission (FP7, Horizon 2020, EDF), Republic of China on Taiwan and India.

15.2.1 European Commission

Under EDF10 (2008 – 2013), €63.9 million was allocated with the focal areas including Health and Education, Improve Water Supply, Support Measures. According to the National Authorising Authority €6.5 million has been allocated to ICT-related activities across EDF10.

Under EDF11 (2014 - 2020) Eswatini is allocated €62 million with focal areas including Agriculture and Food Security, Social Protection, Support Measures.

15.2.1.1 Framework Programme 7

The Ministry of Information Communication Technology is a beneficiary under IST-Africa since 2011. Participation in IST-Africa facilitated MICT to host an IST-Africa FP7 Training Workshop in Mbabane in November 2011 focused on FP7-ICT-Calls 8 - 9 and undertake a consultation with the research community to map expertise. As part of its ongoing IST-Africa activities MICT circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has undertaken a mapping of skills.

Eswatini secured participation in **3** projects in FP7: ICT (2 project) and Space (1 project).

15.2.1.2 Horizon 2020

The Ministry of ICT hosted an IST-Africa Horizon 2020 Training Workshop focused on ICT-39-2017 in November 2016.

Up to September 2018 Eswatini has been involved in **1** Horizon 2020 project

➢ H2020-ICT-2016-INT - **IST-Africa 2016-2018** (CSA) - Ministry of Information Communication Technology

15.2.2 Development Funds for Science, Technology and Innovation

The Republic of China on Taiwan has been the main cooperating partner in the area of Science and Technology and has provided grants for infrastructure development, Education and Training and provision of hardware and software. Funding has also been provided towards The Royal Science and Technology Park (RSTP), which will provide a multipurpose platform for R&D, production, marketing and trading of IT and bio-related technologies. The RSTP has two sites, the Innovation Park, located at Phocweni, Matsapha and the Biotechnology Park, located at Nokwane, Matsapha. Both parks will incorporate entrepreneurship support services: pre-incubation, incubation and accelerator facilities for IT and biotech enterprises. RSTP began partial operations in October 2015 and will scale up its operations in the short term to medium term.

UNESCO has provided direct assistance in relation to the development of National Science, Technology and Innovation (STI) Policy 2012.

Eswatinihas benefited from human resources development programmes mounted by SADC and the AU in cooperation with many other partners.

The EXIM Bank of India is a more recent player in this area (March 2010) and is providing low interest loans for the development of Information Technology Park (US$20million).

Establishment of bilateral and multilateral collaborations: Draft MOUs between Eswatini and other countries in the region (South Africa, Kenya and Mozambique) have been submitted to Cabinet for consideration.

16. REPUBLIC OF TANZANIA

16.1 Introduction

The United Republic of Tanzania is situated in East Africa, with borders with Kenya, Uganda, Rwanda, Burundi, Democratic Republic of Congo, Zambia and Mozambique. It has a surface area of 947,300 sq km, made up to 30 administrative divisions. The population is estimated at 51.557 million (2017, Tanzania National Bureau of Statistics) with a literacy rate of 71.5%. 53.65% of the total population is between 15 – 64 years of age. Dar is Salaam has a population of 5.781 million (2017, Tanzania National Bureau of Statistics). Government Ministries and major institutions have re-located to Dodoma from Dar es Salaam and diplomatic missions are located in Dar es Salaam. Zanzibar has its own government and its own Ministry of Education and several other ministries, which do not fall under union matters. The official languages are Swahili and English (primary language for business, Government affairs and Higher Education).

The Government of Tanzania recognises the importance of ICT and Innovation to support socio-economic development. The National ICT Policy of 2003 was reviewed and approved by Cabinet in 2016 as part of the development of a new implementation strategy. eInfrastructure has dramatically improved with the fibre-optic network, investment in local Internet Exchange Points, migration to IPv6 and construction of the National ICT Backbone (NICTBB). The Tanzania Education Research Network has connected 23 Institutions to the Network Operations Centre (NoC) at COSTECH. ICT Initiatives are primarily focused on eInfrastructure, eEducation, eHealth, Information Society & Entrepreneurship. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

In relation to Communications, according to the TCRA published statistics there were 125,616 fixed lines and 41,708 million mobile subscribers as of June 2018, giving a teledensity penetration of 99% and internet penetration of 45% for 2017. TCRA reported 22,995 million Internet users during 2017 compared with 19,862 million during 2016.

Tanzania has good research capacity with 11 Public Universities, 17 private universities and 26 private institutions of Higher Education.

16.2 Bilateral & Multilateral Cooperation

Tanzania has bilateral cooperation agreements in place with Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Sweden, United Kingdom, India, Japan and South Korea. The World Bank and the European Union are the two major multilateral donors.

Support for ICT and Innovation related activities is primarily provided by European Commission (FP7, H2020, EDF, AfricaConnect), Finland, Sweden, Norway and Netherlands (IICD). Germany provided support to the regional ict@innovation Open Source Project and Ireland is providing support to the Young Scientist Competition.

16.2.1 European Commission

Under EDF10 (2008 – 2013), 555 million euro was allocated with the focal areas including Infrastructure, Communications, Transport; Trade and Regional Integration and Macroeconomic Support. ICT components has been leveraged with 42 projects funded under EDF10 as outlined in Table 9 below.

Under EDF11 (2014 - 2020) 626 million euro has been allocated with the focal areas including Good Governance and Development, Sustainable Agriculture; Energy.   To date three financial agreements (total value €19.2 million) with ICT components have been signed and are being implemented.

Through UbuntuNet Alliance and the Tanzania Research and Educational Network (TERNET), Tanzania is a beneficiary of the AfricaConnect and AfricaConnect 2 eInfrastructure projects co-funded under EDF10 and EDF11.

16.2.1.1   Framework Programme 7

The Tanzania Commission for Science and Technology (COSTECH) is a beneficiary of the IST-Africa Initiative since 2005.

Participation in IST-Africa facilitated COSTECH to host IST-Africa FP7 Training Workshops in Dar es Salaam to raise awareness of FP7 and undertake a consultation with the research community to map expertise. COSTECH raised awareness of the potential of Living Labs in Tanzania and a number of Living Labs received support under the TANZICT Program. Tanzania secured participation in **40** FP7 projects with research funding in the region of **€12 million** in ICT (5 projects), Environment (4 projects), Health (19 projects), Infrastructure (1 project), Food, Agriculture and Biotechnology KBBE (7 projects), SME (1 project), Space (1 project), Social Sciences (2 projects), Transport (1 project).

16.2.1.2   Horizon 2020

As part of its ongoing IST-Africa activities COSTECH circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and has undertaken an initial mapping of research capacity. COSTECH hosted an IST-Africa Horizon 2020 Workshop in Dar es Salaam in January 2014 and an IST-Africa Horizon 2020 Training Workshop focused on ICT-39-2017 Call in November 2016.

Up to September 2018 Tanzania has been involved in 1**7** Horizon 2020 projects with research funding of over **€5** million across a range of thematic areas:

- ENV, H2020-SC5-2014-two-stage- **AfricanBioServices** (RIA) - Sokoine University of Agriculture, Tanzania Wildlife Research Institute; University of Dodoma; University of Dar Es Salaam

- INFRA, H2020-INFRASUPP-2014-2 - **Sci-GaIA** (CSA) - Dar es Salaam Institute of Technology

- H2020-PHC-2015-single-stage_RTD - **EHVA** (RIA) - National Institute for Medical Research

- H2020-WATER-2015-two-stage - **VicInAqua** (RIA) - Science, Technology and Innovation Policy Research Organisation; **FLOWERED** (RIA) - Oikos East Africa; The Nelson Mandela African Institute of Science and Technology

- H2020-ICT-2016-INT - **IST-Africa 2016-2018** (CSA) - Tanzania Commission for Science and Technology

- H2020-SC1-2016-RTD - **SURG-Africa** (RIA) - East Central and Southern Africa Health Community

- H2020-MSCA-RISE-2014 - **IMIXSED** (MSCA-RISE) - The Nelson Mandela African Institute of Science and Technology

- H2020-MSCA-IF-2014 - **ACTUS** (MSCA-IF-GF) - Ardhi University

- H2020-SFS-2016-2 **- InnovAfrica** (RIA) - Sokoine University of Agriculture

- H2020-JTI-IMI2-2015-08-single-stage - **PEVIA** (IMI2-RIA) - Ifakara Health Institute Trust

- H2020-NMBP-X-KET-2017 - **PITBUL (**RIA) - Dodoma Region

- H2020-MSCA-ITN-2017 - **ANTHUSIA** (MSCA-ITN-EJD) - National Institute of Medical Research

- H2020-ICT-2017-1 (ICT-39-2017) **- EPICA** (IA) - The Open University of Tanzania; **WAZIHUB** (IA) - Dar Teknohama Business Incubator Limited

- H2020-SC1-2017-Single-Stage-RTD - **UPSIDES** (RIA) - Ifakara Health Institute Trust

- H2020-SC5-2017-OneStageB - **MONOCLE** (RIA) - Tanzania Fisheries Research Institute

16.2.1.3   Africa4All Parliamentary Initiative[49]

Through the IST-Africa Initiative, the Parliament of Tanzania was included in the Africa4All Parliamentary Initiative, which was funded under the @CP-ICT Call.

Target Countries: Eastern and Southern Africa with pilots in Kenya, Tanzania, Uganda, Lesotho, Namibia

Main partner: Gov2u, **Partner in Tanzania**: National Assembly of Tanzania

Funding: 410k€ from EDF9 (@CP-ICT capacity-building programme) 2009-2011

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[49] http://www.africa4all-project.eu/

Table 10: ICT-related Components in EDF10 Projects Funded in Tanzania

S/N	FINANCING AGREEMENT	S/N	TITLE	TOTAL BUDGET TZS	BUDGET ALLOCATED TO ICT TZS	TOTAL BUDGET EURO	ICT BUDGET EURO	ICT DESCRIPTION
I	EDF 10 Support to office of the NAO	1	10th EDF Support to the Office of National Authorizing Officer - Programme Estimate No 1	1,926,747,463.00	80,000,000.00			Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals
		2	Programme Estimate No 2	2,509,237,136.00	68,000,000.00			Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals
		3	Programme Estimate No 3	1,597,822,790.00	81,900,000.00			Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals
		4	Programme Estimate No 1	2,534,637,976.00	80,000,000.00			Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals
		5	Programme Estimate No 2	2,616,701,279.00	80,500,000.00			Computers and photocopiers, software maintenance, updates and licence renewals
		6	Programme Estimate No 3	1,518,977,197.00	31,500,000.00			Computers and photocopiers, software maintenance, updates and licence renewals
II	10th EDF Energy Programme	1	Increasing Access to Modern Energy Services in Ikondo ward, Njombe District, Iringa region			1,767,244.00	43,900.00	Computers, printers, photocopiers, GPS, administrative software, telephone, internet

		2	Introducing a new concept for affordable biogas systems to connect 10,000 rural households in Tanzania			1,500,000.00	25,000.00	GPS recorders & IT support services
		3	Clusters Solar PV Project- lake zone			950,384.00	10,315.00	Computers
III	Support to Culture	1	Dar es salaam Centre for Architectural Heritage			1,163,976.00	31,800.00	Computers, Cameras, Printers, Sound systems, Projector, Cellphones, Internet, website development
		2	Cultural Heritage Conservation, Tourism and Sustainable Development in the Southern highlands of Tanzania			1,572,386.40	20,650.00	website development, Computers, Servers, Printers, Photocopy machines, Scanner, Software, Audio and Video cameras and GPS
		3	Promotion of Earth and Human Heritage of Ngorongoro by valorization of the Oldupai and Laetolisites, local communities development and creation of the Ngorongoro geopark			2,273,353.00	12,000.00	Computers, Printers, photocopiers and accessories and telephone
		4	Traditional Music and Dance Preservation and Promotion in Northern Tanzania			1,758,711.00	46,156.00	Video and audio computers with software Research Archive, Notation Database Computer, Hard drives for backups, Office computers, photocopier, printers, server for networking, video cameras, Digital Audio recorders, networking hardware, security cameras, website and database management

		5	Heritage Centre on the site of the former Slave Market and Preservation of Christ Church Cathedral, Zanzibar			929,434.00	23,132.00	Computers, Printers, Networks, DVD player, Accounting software, Film Audio and visual display
		6	Promoting heritage resources in Kilwa to Strengthen Social Economic Development			625,000.00	26,350.00	Computers, cameras, Printers, GPS, Video projectors, Telephone and fax
IV	Trade and Agriculture	1	Trade policy and Standards Component	2,743,993,169.00	149,000,000.00			Website upgrading and database management, computers, photocopier, printers, database server, internet and software licence
		2	Trade policy and Standards Component	3,877,493,936.00	32,100,000.00			Computers, software, printers and Trainings on how to use software,
		3	Trade and Agriculture Support Programme			1,177,724.00	46,914.00	Computers, telephone and internet
V	Trade and Agriculture Phase II	1	Increasing smallholder Income through improved quality and market access of cotton produced in Tanzania	3,755,617,950.00	22,250,000.00			Internet, cellphones, ICT consumables, Printers, scanners and cameras
		2	Strengthening smallholder, income and employment from the production of quality tea			819,464.00	9,425.00	Computers, projectors and printers
		3	Strengthening smallholder, income and employment from the production of quality tea	2,005,537,566.90	4,253,126.38			Additional ICT equipments
		4	Strengthening smallholder, income and employment from the production of quality tea	707,493,978.00	2,761,467.00			Additional ICT equipments

			5	Improving Access to Markets Through Enhanced Capacity for Quality and standards compliance for coffee, tea, cotton, fisheries and horticultural products	1,817,786,000.00	25,380,000.00			ICT project Equipment
			6	Improving Access to Markets Through Enhanced Capacity for Quality and standards compliance for coffee, tea, cotton, fisheries and horticultural products	2,178,476,000.00	41,105,500.00			Computers, Graphic software, projectors, printers and external disks, Accounting Package and website development
			7	Commercial Agriculture for Small Farmers in Horticulture			752,099.79	10,424.00	Computers, Printer and contribution to tel/fax
			8	Strengthening Smallholder Producer's Vegetable Production and Marketing			1,277,278.00	44,336.00	Computers, Printer, modems for internet, photocopier machines, internet, telephone, fax and Gateway software-installation, training and maintenance
			9	Improving Production and Marketing of High Value Horticulture Produces for Smallholder Farmers in Uluguru Mountains and Ruaha River Basin through Increased know how and Market Support services , in short MALIMBICHI			1,875,000.00	32,230.00	Computers, Printers, Camera, Internet and telephone
			10	Horticulture Value Chain development in Lindi and MtwaraRegions			1,632,336.00	12,684.00	Computers, printers, Wireless Access Point, Projector and Cameras

		11	Action programme for strengthening measures for fish quality and standards compliance	2,296,404,516.00	34,500,000.00			Internet services, backup devices, Cameras, GPS and computers.
		12	Action programme for strengthening measures for fish quality and standards compliance	2,215,571,553.00	15,900,000.00			Internet services, printers, Fax machine and website hosting.
VI	Global Climate Change Alliance	1	Empowering Vulnerable Rural Communities to Adapt and mitigate the Impacts of Climate Change in Central Tanzania			703,049.00	9,900.00	Computers, External Drives, Cameras, Projectors, photocopiers and printers
		2	ECO-BOMA: a climate-resilient model for Maasai steppe pastoralists			1,796,262.50	46,550.00	Computers and accessories, cameras, GPS, internet, fax, telephone, website development and IT personnel cost
		3	Igunga Eco- Village Project			2,132,480.00	46,915.00	Computers, Cameras, Internet, telephone, IT system for weather information sharing, IT personnel contracts
		4	Integrated Approaches for Climate Change Adaptation in the East Usambra Mountains			1,364,449.00	30,392.00	Telephone, Internet, Computers, cameras, GPS and Printers
		5	Ecovillage Adaptation to Climate Change in Central Tanzania			1,868,974.00	37,500.00	Telephone, GPS, External hard drives, Cameras, video cameras, Printers and computers
		6	Scalable Resilience: Outspreading Islands of Adaptation			1,250,000.00	49,640.00	IT personnel cost, Website development, telephone and fax, audio and video equipments, GPS device, Mapping software and computers

		7	Enhancing climate change adaptation and mitigation capacities of vulnerable communities in eco-villages of different ecosystems of the Uluguru mountains			722,000.00	9,879.00	Computers, photocopier, printer, scanner, projector, video player, digital camera, GPS
VII	Millennium Development Goals	1	Support to the National Panel Survey	986,932,000.00	1,000,000.00			Website development
		2	Support to the National Panel Survey	5,654,762,011.00	248,685,000.00			Website development, data processing, Computer and IT equipment
		3	Support to the National Panel Survey	4,453,054,221.00	355,000,000.00			Computers, printers and photocopier machines
IX	Road Transport Sector	1	Capacity building of the Transport Sector in Tanzania			350,000.00	45,000.00	Improve and operationalize transport sector database
TOTALS		**41**		**45,397,246,741.90**	**1,353,835,093.38**	**30,261,604.69**	**671,092.00**	

Table 11`: ICT-related components in EDF 11 Projects funded in Tanzania

S/N	Financing Agreement	S/N	Type Contract	Contract Number	Title	Total Budget Tzs	Budget Allocated to ICT Tzs	Total Budget Euro	Budget Allocated to ICT Euro	ICT Description	Duration
I	Technical Cooperation Facility 1 (TCF 1) Under 11th EDF	1	Programme Estimate No 1	FED/2018 /397-330	Joint Project Monitoring and Formulation	2,139,771,002.00	90,996,703.00	767,218.00	32,627.00	Purchase of Computers and Printers	2nd May 2018 - 1st November 2019
II	11th EDF support to the Office of the National Authorising Officer	2	Programme Estimate No 1	FED/2015 /367-058	11th EDF Support to the Office of the National Authorising Officer (NAO)	3,283,480,827.00	249,057,284.00	1,318,558.00	103,640.00	Hosting and constant updating ONAO website, purchase of payroll software , Computers and photocopiers, software maintenance, updates and licence renewals	01st October 2015-31st March 2017
		3	Programme Estimate No 2	FED/2017 /385-229	11th EDF Support to the Office of the National Authorising Officer (NAO)	3,226,091,649.00	135,622,923.00	1,366,409.00	57,443.00	Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals	01st April 2017-30th September 2018

	4	Programme Estimate No 3	FED/2018 /399-557	11th EDF Support to the Office of the National Authorising Officer (NAO)	3,235,429,716.00	117,500,000.00	1,221,802.00	44,372.00	Hosting and constant updating ONAO website, Computers and photocopiers, software maintenance, updates and licence renewals	01st October 2018-30th September 2019
	TOTALS				**11,884,773,194**	**593,176,910.00**	**4,673,987**	**238,082**		

16.2.2 Finland

Finland is actively involved in ICT and Innovation initiatives in Tanzania. A programme preparation phase was undertaken during 2009 – 2010 to prepare for the launch of TANZICT, which commenced in September 2011. The TANZICT programme was extended until July 2016 to facilitate the preparation of a new programme TANZIS for 5 years. This new programme has not yet commenced. COSTECH is the focal point for Tanzania for Southern Africa Innovation Support Programme (SAIS 2) since 2017.

16.2.2.1 CSBKE (Creating Sustainable Business in the Knowledge Economy)

This programme focused on improving capacity of Sub-Saharan business incubators in mobile applications development, social networking and market deployment.

Target Countries: Southern and Eastern Africa, pilots in Tanzania, Mozambique and South Africa

Main Partners: Ministry for Foreign Affairs Finland (MFA), InfoDEV Programme, Nokia Corporation

Funding: Global programme of which 3,3 M€ allocated to Africa from MFA for period 2010-2012

16.2.2.2 Information Society and ICT Sector Development Programme

This Programme was focused on providing technical assistance for the deployment of ICT policy and strategy.

Target Country: Tanzania

Main Partners: Ministry for Foreign Affairs Finland (MFA), Ministry of Communication, Science & Technology of Tanzania

Funding: €500,000 2009-2010 (programme preparation phase)

16.2.2.3 TANZICT[50]

TANZICT[51] was an Information Society and ICT Sector development bi-lateral project between the Government of Tanzania and the Government of Finland, which was hosted by COSTECH and commenced in August 2011. It was focused on strengthening the Tanzania Information Society through a revision of the national ICT Policy and associated Implementation, strengthening the institutional capacity of MCST and creating a Tanzania Innovation programme. It created a community spirit through support for pre-Incubation, training for women entrepreneurs, community events and hands-on support.

TANZICT set up an open Innovation Space and pre-Incubation space in October 2011 on the ground floor of COSTECH, which is now called Buni Hub. The Innovation Space provides co-working space with Wi-Fi Internet access for up to 40 people, a meeting space for up to 60 people, regular training and networking events. TANZICT and DTBi launched joint Call for Pre-Incubation and Incubation.

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[50] http://tanzict.or.tz/
[51] http://tanzict.or.tz/

TANZICT co-operated with IIMC in relation to the second IST-Africa Living Lab Workshop[52] in Dar es Salaam in May 2012. TANZICT is providing hands on support to emerging Living Labs in Iringa, Kigamboni, Mwanza, Mbeya, Zanzibar and Arusha.

TANZICT launched the FEMTANZ 3-month Programme in December 2012 to provide business support training to women who wish to establish the grow their own technology-enabled businesses. Participants came together in Dar es Salam for three 2.5 day workshops during December 2012, January 2013 and February 2013. The initial training was provided by Tina James and Jill Sawers of FEMTECH. Fifteen people were involved in the first course, which was provided free of charge in English and three people were trained as trainers. In the future it may be necessary to translate the materials into Swahili.

TANZICT and COSTECH launched an ICT Innovation Fund in 2012 to provide seed funding to develop a prototype or pilot a service, which was managed by COSTECH and funded by TANZICT. The grant ($7,000 - $10,000) was focused on funding development of a prototype, technical work and technical skills but was not aimed at supporting the running costs of a start-up. It was a requirement that the recipient is hosted at an existing Incubator or Hub such as DTBI, Buni Hub, university incubator or KINU Innovation Hub that can provide mentoring and monitor their progress. The first Call for Applications closed in November 2012, received 25 applications with the first cohort of six grantees announced in April 2013 with funding of €50,000 in total. The second call received 44 applications with ten grantees announced in October 2014 and funding of €70,000 in total. The third Call closed in September 2014 and seven projects were funded. The four Call closed in May 2015 and received 137 proposals of which 18 innovators were awarded grants with a total funding of €155,000.

This programme had a high impact in Tanzania in terms of actively supporting Policy review, Innovation activities and capacity building. Two non-cost extensions were undertaken to facilitate the project to run up to July 2016. A follow on project is being planned to leverage the success of the TANZICT Programme.

Target Country: Tanzania

Main Partners: Ministry for Foreign Affairs Finland (MFA), Ministry of Communication, Science & Technology of Tanzania, COSTECH

Funding: Government of Finland, €5 million (Sept 2011 – August 2015, extended to 2016)

16.2.2.4 TANZIS

TANZIS was prepared as the follow on project from TANZICT focused on support to Tanzania's Innovation System. The overall objective of TANZIS is to support a "Functioning national innovation system in Tanzania contributing to companies' increased competitiveness, access to new markets and job creation". It is a cooperation between the Government of the United Republic of Tanzania

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[52] http://www.ist-africa.org/home/files/ISTAfrica2012_LivingLabsWorkingGroupMeetingReport.pdf

and the Ministry for Foreign Affairs of Finland to intensify cooperation in the field of Innovation. Originally it was envisaged that this project would run from 2016 - 2021 but it has not commenced activities yet.

As outlined in the 2nd Five Year Development Plan (2016/2017-2021), Tanzania is embarking on economic and social development through industrialisation. The plan acknowledges that industrialisation and inclusive socio-economic development can only be attained through accumulation of national science, technology and innovation capabilities. The Ministry of Education, Science and Technology (MEST) has prepared a policy paper for Science, Technology and Innovation STI) focused on highlighting the government priorities in STI. It will also lead to preparation of STI Act.

It has been determined that there are five main reasons why the innovation system in Tanzania does not function optimally which TANZIS aims to address: 1) lack of innovation policy; 2) lack of linkages between industry, academia and government; 3) inadequate funding to initiate and commercialise innovative ideas; 4) insufficient information on innovation, especially on successful innovations and 5) low innovation capacity and business skills or business understanding of SMEs, NGOs and funding agencies.

TANZIS aims to support the following outcomes:
➢ Enabling environment for innovation strengthened (immediate, system level);
➢ Sustainable results from actions on enabling environment for innovation (intermediate system level);
➢ Innovations created (immediate innovation level);
➢ Innovation projects produce economic and societal benefits (intermediate innovation level).

It has three components:

1. Increased opportunities for innovation through funding for innovation and cooperation through special innovation window in NFAST (here referred to as NFAST-I) and through skills development and capacity building (e.g. by supporting Living Labs or Team Academy activities).

2. Increased COSTECH capacity for fund management through capacity development, strategy and communication plan for NFAST-I; and

3. Increased information on innovation by advocating and raising awareness on the importance of innovation among policy makers, civil servants and general public.

It is envisioned that by the end of TANZIS, NFAST-I will be the most important source of innovation funding in Tanzania, with Tanzanian public and private financing, capable staff for fund management and an increasing number of innovators applying for funding.

Partners: Ministry for Foreign Affairs Finland (MFA), Ministry for Education, Science and Technology, COSTECH

Funding: €12.8 million, Ministry of Foreign Affairs Finland (70%), Government of Tanzania (30%)

It is envisaged that € 5.75 million (45%) will be allocated to finance innovation and cooperation, € 3.8 million (30%) will be used for international and national long-term and short-term technical assistance, € 3.2 million, (25%) to cover salaries of the Tanzanian staff and local expert, administrative costs and other costs such as office space, equipment and recurrent costs.

16.2.2.5 Southern Africa Innovation Support Programme (SAIS 2)[53]

SAIS 2 is focused on supporting the growth of new businesses through strengthening innovation ecosystems and promotion of cross-border collaboration between innovation players in Southern Africa. It is supported by the Ministry for Foreign Affairs (MFA) of Finland, in partnership with the Ministry of Infrastructure, Science and Technology, Botswana; Ministry of Higher Education, Training and Innovation (Namibia); Ministry of Education, Science and Technology, Tanzania; Ministry of Higher Education, Zambia; Department of Science and Technology, South Africa and the Southern African Development Community (SADC) Secretariat. It is supporting Sustainable Development Goals 4, 8, 9 and 17. It is focused on supporting institutional capacity to support innovation and enterprise development, improved enterprise capacity to innovate and enter new markets and an improved enabling environment to support inclusive innovation activities in the region.

SAIS2 is managed by a Programme Management office, hosted by NCRST in Namibia and implemented by focal points in Botswana, Namibia, South Africa, Tanzania and Zambia.

The SAIS2 Innovation fund publishes competitive Calls for proposals to award grants for locally implemented projects in the five partner countries. The first Call for Proposals ran from February to April 2018 with three funding opportunities focused on cross border projects to support development o f institutional capacity for regional innovation cooperation; Scaling Enterprises through stronger Innovation Support organisations and Improving enabling environment for inclusive activities in the region. Four projects were selected for funding under each funding windows with twelve projects funded in total. The second Call for Proposals runs from November 2018 to January 2019.

SAIS 2 aims to support three capacity building programs for Innovation Fund grantees: Data Collection and Analytics Framework Training; Accelerator Programme for Entrepreneurs and Innovation Intermediaries and Inclusive Innovation and Capacity Building Program.

SAIS2 supported Connected Hubs to share best practices in innovation support through online and offline training sessions. In 2018 it organised the Annual Southern Africa Innovation Forum. Connected Hub Members during 2018 included Botswana Innovation Hub, Gen BW; National Commission on Research Science and Technology, Namibia; Namibia Business Innovation Institute; COSTECH, Tanzania; BuniHub, Tanzania; Technology Innovation Agency, South Africa; mLab, Southern Africa; National Technology Business Centre, Zambia and BongoHive, Zambia.

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[53] www.saisprogramme.com

National Focal Points: Botswana Innovation Hub (BIH), National Commission on Research Science and Technology Namibia (NCRST), Technology Innovation Agency, South Africa; COSTECH, Tanzania; National Technology Business Centre, Zambia

Funding: €9.3 million, Ministry of Foreign Affairs Finland 2017 - 2021

16.2.2.6 FORVAC

FORVAC (Forest and Value Chain development programme) has a total budget of 9.95 million euros and is implemented for four years. FORVAC's main priority is to increase economic, social and environmental benefits from forests while reducing deforestation. This objective is achieved by developing value chains, by increasing private sector involvement and by improving capacities, monitoring systems, legal and policy frameworks in the forest sector.

16.2.3 Norway

16.2.3.1 Health Informatics Systems Programme

In order to strengthen the collection and handling of health information and improving health services management, the Ministry of Health and Social welfare, the University of Dar es Salaam and the University of Oslo, implemented and rolled out of DHIS throughout the health sector including all facilities, districts and regions.

Target Country: Tanzania

Main Partners: University of Dar es Salaam, School of Informatics and Communication Technologies in cooperation with University of Oslo

Funding: Embassy of Norway in Tanzania, University of Oslo

16.2.3.2 Masters Programme in Health Informatics

In an effort to build capacity of health managers and health professional in ICT the University of Dar es Salaam School of Informatics, School of Public Health and Social Science MUHAS and the University of Oslo is offering a Masters Programme in Health Informatics already underway to carter for lower level cadre.

Target Country: Tanzania

Main Partners: University of Dar es Salaam, School of Informatics and Communication Technologies, Muhimbili University of Health and Allied Sciences (MUHAS) School of Public Health in cooperation with University of Oslo

Funding: NORAD

16.2.4 Sweden

Swedish International Development Agency (SIDA) is funding a number of ICT-related initiatives that have implemented by COSTECH, Ministry of Education and Vocational Training, Ministry of Communications, Science and Technology Open University of Tanzania, Dar es Salaam Institute of

Technology and Tanzania Communication Regulatory Authority. A series of projects were undertaken focused on ICT Leadership, ICT in Schools, ICT in Teacher training colleges, mainstreaming ICT, Including ICT in OUT activities over the past decade. SPIDER is currently funding some projects in Tanzania.

16.2.4.1 TANSENE for Post Doctoral Support

As a result of the government decision to invest in research, COSTECH has been able to attract external funding of research for development. Tanzania, Sweden and the Netherlands have agreed to set a "Common Fund" named "TASENE" for post doctoral support for scientists from Tanzania, Sweden and Netherlands. The fund attracted a total of Euro 1,800 million in equal contributions as a pilot project. A joint first call for competitive research projects was made in June 2011, which allowed scientists and researchers from the three countries to jointly apply for grants.

Funding: Tanzania, Sweden and Netherlands

16.2.4.2 ICT for Rural Development

ICT4RD[54] was a research and development project in the area of broadband connectivity to rural of Tanzania, utilizing available infrastructures mainly fibre optic and outdoor wireless. Its focus is improving services by making information easily available and accessible in the areas for education, health and local government management.

The main objective of the project was the establishment of sustainable broadband markets in rural areas offering connectivity, system integration and capacity building programmes, including project management skills, technology and entrepreneurship; in close cooperation with partners already working with healthcare, school, local administration and small and medium enterprises

The project deployed a Health Management Information System (HMIS) to health centres and district hospitals, which allows easy collection and analysis of information.

Other services deployed included an eLearning system in the secondary schools and hospitals. The eLearning supports guided learning and individual learning, teachers are using the platform to create and store content for students. Using the content on the server (repository), teachers, students as well as hospital staff use the platform for self-learning.

Target Country: Tanzania

Main Partners: Tanzania Commission for Science and Technology (COSTECH)

Funding: Swedish International Development Agency (SIDA)

16.2.4.3 Research Cooperation to Tanzania Academic Institutions

A number of academic institutions have received support from SIDA including:

➢ University of Dar es Salaam (2015-2020): $2,176,343

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[54] http://www.ict4rd.ne.tz/

UDSM applied to Sida for funding of 153 300 000 SEK to carry out the "Towards Enhanced Sustainability of Strategic Research and Innovation Systems for Inclusive Development in Tanzania" programme. It aims to build institutional research capacity at UDSM to support research that can be used to address major issues of development in Tanzania and especially for people who live in poverty. It consists of 12 subprograms, which address: food security, water and sanitation, energy, business administration with regards to agriculture and tourism, and marine sciences. Other programs focus on research management capacity and use of research results. UDSM has partnerships in place with Swedish universities and institutions to support research capacity development. From the agreed 153,300,000 SEK, 86,563,000 SEK will be directed to UDSM, 50,254,000 SEK through UU/ISP to Swedish universities and institutions, 13,183,000 SEK will be transferred through UU/ISP to Tanzanian students while in Sweden and 3,300,000 SEK to UU/ISP for coordination of Swedish collaborating universities and institutions.

➤ Muhimbili University of Health and allied Sciences (MUHAS) - $1,304,083

MUHAS applied to Sida for funding of 82 000 000 SEK to carry out the "Health Research, Training and Innovation for Sustainable Development" programme. . It aims to build institutional research capacity at MUHAS to support research that can be used to address major issues of development in Tanzania and especially for people who live in poverty. It has 7 subprograms, including HIV/TB, malaria, child and maternity health, health system research and trauma with focus on traffic injuries. Other programs are focused on research management capacity and use of research results. MUHAS has existing partnerships with Swedish universities and institutions to support research capacity development. Of the agreed 82,000,000 SEK, 49,232,700 SEK will be directed to MUHAS, 27,083,300 SEK through UU/ISP to Swedish universities and institutions, 3,684,000 SEK will be transferred through UU/ISP to Tanzanian students while in Sweden and 2,000,000 SEK to UU/ISP for coordination of Swedish collaborating universities and institutions.

➤ Institute of Marine Science (2015-2020): $772,201

16.2.4.4 Open access: knowledge sharing and sustainable scholarly communication in Kenya, Tanzania and Uganda

This project aimed to raise visability and accessiblity of research outputs in Kenya, Tanzania and Uganda using free and open source software for open repositories and open access journals in higher education and research institutions. It aimed to develop a sustainable network of open access champions and reinforce local capacity in the management of open access journals and repositories.

Main Partners: EIFL (Electronic Information for Libraries) in cooperation with Kenya Library and Information Services Consortium and Medical Students' Associations of Kenya (MSAKE), The Network of African Science Academies (NASAC), National Council for Science and Technology, Directorate of Higher Education, Ministry of Education, Science and Technology Kenya; *Consortium for Tanzania Universities and Research Libraries and Ifakara Health Institute (IHI), Sokoine University of Agriculture (SUA), University of Dar es Salaam (UDSM), Muhimbili University of Health*

and Allied Sciences (MUHAS), Ministry of Health and Social Welfare (MoHSW) and Tanzania Commission for Science and Technologies (COSTECH); and Consortium of Uganda University Libraries (CUUL) and Inter-University Council for East Africa (IUCEA), National Council for Higher Education, National Information Technology Authority Uganda (NITA-U), Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), Research and Education Network of Uganda (RENU) and Uganda National Council for Science and Technology (UNCST)

Target Countries: Uganda, Kenya, Tanzania

Funding: 500,000 SEK from SPIDER, June 2013 - May 2014

16.2.4.5 Open access policy development in Kenya, Tanzania and Uganda to make more digital content available[55]

This project aims to continue supporting the 16 Universities previously involved in the "Open Access in East Africa" project leveraging the Open Access repositories, journals and existing infrastructure. EIFL will continue to work with the Universities and their senior management to put more policies focused on open access to research outputs in place. It will instigate institutional Open Access policy task forces, which can take responsibility for implementing Open Access policies, workshops, webinars and capacity building events. This project is expected to run from April 2016 to March 2018.

Main Partner: EIFL – Electronic Information for Libraries

Funding: SPIDER Programme (Funded by SIDA)

16.2.4.6 Enhancing Early Grade Literacy and Numeracy Using Digital Content among Primary Schools in Refugree Villages in Nyarugusu Camp, Kigoma, Tanzania[56]

This project aims to support literacy and numeracy competence among refugee primary school children in three schools in Nyarugusu Refugee Village, in Kigoma. It aims to support 6 teachers and about 958 students in standard I and standard II. About 20% of the students cannot read and write well. Teachers will be provided with training and resources through the Online Professional Learning Community and customized Edmodo Learning Management System to support integration of digital content to achieve learning outcomes. Teachers will share experiences and will be supported through Teacher Resource Centers. A flipped classroom pedagogical model will be leveraged. It is envisaged that each school will have an ICT resource room where tablets will be shared by learners in engaging with digital content during practical sessions.

This project is expected to run from May 2017 to April 2019.

Main Partner: College of Education, University of Dodoma

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[55] https://spidercenter.org/project/eifl_2016/
[56] https://spidercenter.org/project/enhancing-early-grade-learning-among-primary-schools-in-refugee-villages-in-nyarugusu-camp/

Funding**: SPIDER Programme (Funded by SIDA)17.2.5 Germany**

ict@innovation[57] was focused on building capacities in African Small and Medium sized ICT enterprises in relation to using Free and Open Source Software (FOSS) by spreading FOSS business models for enterprises in Africa, fostering FOSS certification and supporting innovative local FOSS applications for social and economic development.

Target Countries: Eastern and Southern Africa (Kenya, Malawi, Mozambique, Rwanda, South Africa, Tanzania, Uganda, Ethiopia, Namibia, Zambia)

Main partners: Partnership of FOSSFA (Free Software and Open Source Foundation for Africa) and InWEnt - Capacity Building International on behalf on behalf of German Federal Ministry of Economic Cooperation (BMZ), the Open Society Initiative for Southern Africa (OSISA).

Funding: 1.6m euro from German Federal Ministry of Economic Cooperation (BMZ), 2008 – 2010 first phase

16.2.6 Ireland

The Irish Government through Irish Aid is replicating the BT Young Scientists and Technology Exhibitions in Tanzania. Young Scientists Tanzania[58] was launched by Hon. Prof. Makame Mbarawa, the former Minister of Communication, Science and Technology during the National Science Week in November 2011. A delegation from Tanzania visited the BT Young Scientist Exhibition in Dublin in January 2012 to experience the event first hand. Subsequently winners have had the opportunity to participate in the Young Scientist Exhibition in Dublin each January. The first Exhibition took place in Dar es Salaam in October 2012 and the seventh anniversary took place in August 2018.

This initiative is providing practical support to improving the teaching of science by assisting secondary schools to identify and prepare projects for inclusion in the competition process. Winning teams have the opportunity to travel to Dublin, Ireland with their teacher to visit the BT Young Scientist and Technology Exhibition the following January, thus increasing the knowledge exchange between Ireland and Tanzania.

It supports a Science Outreach Program across Tanzania and an Annual Young Scientist Exhibition and competition for secondary schools to showcase their research, which is based on the Young Scientist model in Ireland. The Science Outreach Program supports the Tanzania National Five Year development plan published by Ministry of Finance and Planning and the African Union, Continental Education Strategy Plan (CESA 2015-2025) by supporting scientific capacity building among teachers and students.

Main partners: Ministry of Education, Science and Technology, COSTECH

Funding: Irish Aid and Pearsons

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[57] http://www.ict-innovation.fossfa.net/
[58] http://www.youngscientists.co.tz/

16.2.7 United Kingdom

The Department for International Development (DFID) is supporting the Human Development Innovation Fund[59] in Tanzania. It aims to identify and support innovation and market-driven solutions that have the potential to create social impact in education, health and water, sanitation and hygiene (WASH) across Tanzania. It implements: strategies and interventions to strengthen the national innovation ecosystem; grant mechanisms to support projects through the Innovation Fund and activities to strengthen the innovation evidence base in Tanzania.

HDIF organises an Annual Innovation Week in Dar es Salaam in cooperation with COSTECH

The HDIF Innovation Fund has run three Innovation Challenges since 2013 funding 43 projects addressing Health, Education and WASH across Tanzania.

Main partners: DFID, COSTECH, Implemented by Palladium International in partnership with KPMG, Newcastle University, Water, Engineering and Development Centre (WEDC) at Loughborough University and the Institute of Development Studies (IDS)

Funding: DFID, £39.4m, 2013 - 2020

16.2.8 Denmark

The Danish Royal Embassy provided a grant of 2.5 billion Tanzanian Shillings to Dar Teknohama Business Incubator (DTBi) to run the Tanzania Digital Innovation Youth Empowerment Programme (TADIYE). It is focused on supporting innovation and entrepreneurship ecosystem development among youth and women. It will run a business plan challenge and provide entrepreneurship skills and computer based skills using a digital entrepreneurship learning platform which will be developed by DTBi entrepreneurs with entrepreneurship content provided by IMED. The digital platform is planned to be launched in October 2018 to provide online training. Participants who complete the training can enter the business plan competition in February 2019 to provide seed funding of up to 22 million Tanzanian Shillings.

Main partner: Dar Teknohama Business Incubator (DTBi)

Funding: Danish Royal Embassy, 2.5 billion Tanzanian Shillings, 18 months from July 2018

16.3.9 World Bank

16.3.9.1 *Science Technology and Higher Education Program*

Science Technology and Higher Education Program (STHEP) was a World Bank funded project to the Government of Tanzania, implemented through the Ministry of Education and Vocational Training (MoEVT) program with support from the Ministry of Communication Science and Technology (MCST). This was initially a seven-year program, which was approved in 2008 and divided into two phases of activities. APL1 activities were to be implemented within the first two

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[59] http://www.hdif-tz.org

years and APL2 activities were to be accomplished within the last five years of the program. The long-term purpose of STHEP was to improve development of human capital in area of Science and Technology (S&T) and create a knowledge-based economy within the next ten years. 128 Higher Education and Research Institutions (HERIs) were identified under the STHEP program.

STHEP had four program components: Component 1A – Investments in Priority Discipline for Economic Growth; Component 1B – Expanded capacity for Teachers preparation and for graduate's studies in education; Component 2A – Strengthening Key Higher Education Agencies and Institutions; Component 2B – Investments in ICT based Higher Education Systems. STHEP Component 2B was focusing on four (4) major areas being; National Research and Education Network (NREN), Education Management Information system (EMIS), E-Library, and E-Learning. Shared mechanisms to support the implementation of Component 2B of STHEP have being established between all 128 HERIs under this program.

TERNET[60] was established in 2008 (component 2B) as the National Research and Education Network (NREN) to: better manage the increasing numbers of students as the education sector expands; improve the quality of data used in decision making and resource management; enhance knowledge sharing; improve transparency; improve classroom student-teacher participation; and improve research capability.

The final findings of the feasibility study for the development of E-libraries and EMIS was presented on 18th December 2012. The piloting of the e-learning system commenced in February 2013 with five Universities. The piloting for E-libraries and EMIS was undertaken with eight institutions from February 2013.

In June 2014, the Program was extended for a further 18 month period with an additional loan of $15 million to finish existing activities ($6.37 million) and commence new activities to pilot reforms introduced by STHEP-1 related to secondary school science teachers and support the tertiary education system to be more responsive to the labour market demand. This project is now completed.

Funding agency: World Bank, IDA credit, $100 million + further $15 million (2008 - 2014)

16.3.9.2 *Tanzania Education and Skills for Productive Jobs Program (ESPJ)*

The Education and Skills for Productive Jobs (ESPJ) Project for Tanzania aims to strengthen the institutional capacity in skills development within the Ministry of Education, Science and Technology and promote the expansion and quality of labour market driven skills development opportunities in six economic sectors. It is supporting the Government's National Skills Development Strategy (NSDS). It aims to create a National Skills Council.

Funding agency: World Bank, IDA credit, $120 million (2016 - 2021)

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[60] www.ternet.or.tz

16.3.9.3   Rural Electrification Expansion Program

The Rural Electrification Expansion Project aims to increase access to electricity in rural areas; and scale-up the supply of renewable energy in rural areas while strengthening sector institutional capacity. It will be implemented within the National Rural Electrification Program (NREP) being undertaken by The Rural Energy Agency (REA) and the private sector between 2013 – 2022. It aims to connect 2.5 million households in rural areas to the national electricity grid. It will connect new customers to the grid, add new connections to the grid, support electrification through off-grid investments and development of renewable technologies.

Funding agency: World Bank, IDA credit, $220 million (2016 - 2022)

17. TUNISIA

17.1 Introduction

Tunisia is located in North Africa, in the eastern part of the Maghreb; bordered to the north and east by the Mediterranean Sea, to the south by Libya and to the West by Algeria; a crossroads between Europe on the one hand and the Middle East and Africa on the other hand. The name Tunisia is derived from its historic and economic capital, Tunis, located in the northeast and known as Carthage City. Tunisia has a surface area of almost 164,000 square kilometres (64,000 sq mi), made up of 24 governorates (administrative divisions). The population as at July 2018 was estimated at 11,516 million inhabitants with a literacy rate of 81.8% (CIA World Factbook). 66.53% of the total population is between 15 and 64 years of age. Tunis, the capital city, has a population of 2.291 million (2018, CIA World Factbook). The official language is Arabic, and French and English are also fluently spoken.

Tunisia considers the development of ICT to be a priority in terms of economic and social activities, health, e-learning, renewable energy and control of the natural environment. There is a good policy Framework in place and good eInfrastructure with links to three submarine cables, a National backbone based on fibre optic cables and a National IXP. ICT Initiatives are focused on eGovernment Services, eInfrastucture for Education and Research, eInfrastructure for Innovation (such as Technology and Cyber Parks) and support measure for software companies and start-ups. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives and Research Capacity in IST-Africa Partner Countries", January 2016.*

Based on statistics published by the Ministry of Higher Education and Scientific Research and the Ministry of Information and Communication Technologies[61], the levels of mobile subscriptions are 14.175 million and 1.008 million for fixed phone subscriptions as at March 2017. Mobile teledensity is 124.2% as at March 2017. Mobile Internet subscriptions via smartphones were 6.39 million and fixed internet subscriptions 705,744.

Tunisia has a strong research base with 13 public Universities (more than 200 public institutions) and 60 private Higher Education Institutions. Of these 30 have departments focused on ICT/Engineering.

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[61] http://www.mincom.tn

17.2   Bilateral & Multilateral Cooperation

There are 18 European Embassies (Austria, Belgium Bulgaria, Czech Republic, Finland, France, Germany, Greece, Hungary, Italy, Malta, Netherlands, Poland, Portugal, Romania, Spain, Sweden and United Kingdom) in Tunisia.

Tunisia has enjoyed strong bilateral relations with a number of European countries. The European Commission, France, Germany and Italy are particularly active in supporting ICT and Innovation related activities and research programs. Portugal, Switzerland, Spain, Belgium, Greece, India and South Africa support bilateral research projects.

17.2.1 European Commission

The European Commission is a significant multilateral donor through the European Neighbourhood and Partnership Instrument (ENPI). Under ENPI (2007-2010) €300 million was allocated, with the focal areas including Economic Governance, Competitiveness and Convergence with the EU, Improved Graduate Employability, Sustainable Development and ENPI (2011 - 2013), €240 million allocated with focal areas including Employment and Social Protection, Integration, competitiveness of companies, justice sector.

Focal areas under the European Neighbourhood Instrument (ENI) for 2014 - 2016 include: Socio-Economic reforms for inclusive growth, competitiveness and integration; Strengthening fundamental elements of democracy; Sustainable regional and local development, with a budget of €234 million allocated for 2014 - 2015. The indicative budget for 2014 - 2020 ranges from €725 - €886

Through ASREN and the Tunisia National University Network (RNU), Tunisia is a beneficiary of the AfricaConnect 2 eInfrastructure project co-funded under EDF11.

17.2.1.1   Framework Programme 7

Ministere de l'Enseignement Superieur, de la Recherche Scientifique et TIC, Tunisia is a beneficiary under IST-Africa since 2011. This provided an opportunity to organise several IST-Africa Training Workshop on FP7 and H2020.

Tunisia secured participation in **87** projects with research funding in the region of **€13.4 million** under FP7. This is broken down thematically into: ICT (5 projects); Energy (2 project); Environment (13 projects), Health (10 projects); INCO (17 projects); Infrastructures (1 project), Food, Agriculture and Biotechnology KBBE (19 projects); NMP (3 projects); PEOPLE (2 projects); REGPOT (6 projects); Security (1), Science in Society (2 project); SME (1 project); Space (1 project); SSH (2 projects); Transport (2 projects).

17.2.1.2   Horizon 2020

As part of its ongoing IST-Africa activities MESRS circulates updates on open Calls for Proposals as they are available, encourages the research community to explore these opportunities for international research projects, promotes the research centres during international meetings and

has undertaken an initial mapping of skills related to Horizon 2020. It hosted IST-Africa Horizon 2020 Training workshops in Tunis in December 2013 and in September 2014.

Up to September 2018 Tunisia has been involved in 43 Horizon 2020 projects with funding of over €7.623 million across a range of thematic areas:

- INFRA, H2020-INFRADEV-1-2014-1 - **ARISE2** (RIA) - Centre National de la Cartographieet de la Teledetection
- H2020-SC5-2015-one-stage - **GEO-CRADLE** (CSA) - Centre D'etudes et de Recherches de telecommunications)
- H2020-INT-SOCIETY-2015 - **MedReset (**RIA) - Faculte de Droit et des Sciences Politiques de Tunis
- H2020-WATER-2015-one-stage - **WaterWorks2015** (ERA-NET-Cofund) - Institution de la Recherche et de L'enseignement Superieur Agricoles
- H2020-SFS-2015-2 - **SALSA** (RIA) - Institut National de la Recherche Agronomique de Tunisie
- H2020-NMP-2015-two-stage - **MIDES** (IA) - Ecole Nationale D'ingenieurs de Gabes
- H2020-WATER-2015-two-stage - **MADFORWATER** (RIA) - Faculty of Sciences of Tunis, University of Tunis el Manar; Institut Superieur de Biotechnologie de Sidi Thabet
- H2020-WATER-2015-two-stage - **FLOWERED** (RIA) - Observatoire du Sahara et du Sahel
- H2020-INT-INCO-2015 - **5TOI_4EWAS** (CSA) - Chambre de Commerce et D Industrie du Centre; Ministry of Higher Education and Scientific Research; Agence Nationale de Protection de L'environnement
- H2020-SC5-2016-OneStageA - **4PRIMA** (CSA) - Ministry of Higher Education and Scientific Research
- H2020-ICT-2016-INT - **IST-Africa 2016-2018** (CSA) - Ministry of Higher Education and Scientific Research
- H2020-MSCA-RISE-2016 - **trans-making** (MSCA-RISE) - Forum Tunisien pour les Droits Economiques et Sociaux
- H2020-MSCA-RISE-2016 - **IPM-4-Citrus** (MSCA-RISE) - Centre de Biotechnologie de Sfax - Cbs; Institut Pasteur de Tunis; Centre Technique des Agrumes; Wiki Start-Up; Les Laboratoires Medis
- H2020-SC6-REV-INEQUAL-2016 - **DARE** (RIA) - Sfax University
- H2020-SFS-2016-2 **- MedAID** (RIA) - Institut National des Sciences et Technologies de la Mer
- H2020-SwafS-2016-1 - **InSPIRES** (RIA) - Institut Pasteur de Tunis
- H2020-BG-2016-2 -**ODYSSEA** (RIA) -Regional Activity Center for Specially Protected Areas; Association Nationale de Développement Durable et de la Conservation de la Vie Sauvage
- H2020-EEN-GA-2017-2018-1 -**H2020 WP2017-2018** (CSA) - Agence de Promotion de l'Industrie et de l'Innovation

- H2020-SFS-2016-2 -**PALE -BLU** (RIA) - Institut Pasteur de Tunis
- H2020-SEC-2016-2017-1 - **PRACTICIES** (RIA) - Associatio Forum des Sciences Sociales Appliquées ; Présidence du Gouvernement
- H2020-MSCA-RISE-2016 - **CURE-XF** (MSCA-RISE) - Institut National de la Recherche Agronomique de Tunisie
- H2020-MSCA-ITN-2014 - **EUROLEISH-NET** (MSCA-ITN-ETN) - Institut Pasteur de Tunis
- H2020-MSCA-RISE-2014 - **TROPSENSE** (MSCA-RISE) - Institut Pasteur de Tunis
- H2020-MSCA-RISE-2015 - **MediHealth** (MSCA-RISE) - Faculte des Sciences de Sfax
- H2020-MSCA-RISE-2015 - **EXANDAS** (MSCA-RISE) - Centre De Biotechnologie De Sfax - Cbs
- H2020-SFS-2017-1 - **ForestValue** (ERA-NET-Cofund) - Institution de la Recherche et de L'enseignement Superieur Agricoles
- H2020-MSCA-COFUND-2016 - **BITRECS** (MSCA-COFUND-FP) - Institut Pasteur de Tunis
- H2020-SFS-2017-1 - **AfriCultuReS** (RIA) - Observatoire du Sahara et du Sahel
- H2020-BG-2017-1 - **CLAIM** (IA) - Institut National des Sciences et Technologies de la Mer
- H2020-RUR-2017-1 **- INCREdible** (CSA) - Institut National de Recherches en Genie Rural, Eaux et Forets
- H2020-MSCA-RISE-2017 - **bTB-Test** (MSCA-RISE) - Institut Pasteur de Tunis
- H2020-SC5-2017-OneStageB - **WaterWorks2017** (ERA-NET-Cofund) - Institution de la Recherche et de L'enseignement Superieur Agricoles; Ministry of Higher Education and Scientific Research
- H2020-MSCA-RISE-2017 **- EMERTOX** (MSCA-RISE) - Institut National des Sciences et Technologies de la Mer
- H2020-MSCA-RISE-2017 **- LeiSHield-MATI** (MSCA-RISE) - Institut Pasteur de Tunis
- H2020-SFS-2017-2 - **BRESOV** (RIA) - Universite de Tunis el Manar
- H2020-RUR-2017-2 - **LIVERUR** (RIA) - Dar Margoum Ouedhref
- H2020-SwafS-2017-1 - **R-I PEERS** (CSA) - Agence Nationale de la Promotion de la Recherche Scientifique
- H2020-ECSEL-2017-2-RIA-two-stage - **SECREDAS** (ECSEL-RIA) - Ecole Nationale D'ingenieurs de Tunis; Ecole Superieure des Communications de Tunis
- H2020-LCE-2017-RES-IA - **SUPER PV** (IA) - Agence Nationale pour la Maitrise de L'energie
- H2020-SCC-NBS-2stage-2017 - **EdiCitNet** (IA) - Association Tunisienne de Developpement Durable: la Recherche en Action; Commune de Carthage
- H2020-WIDESPREAD-05-2017-Twinning - **PHINDaccess** (CSA) - Institut Pasteur de Tunis

> H2020-WIDESPREAD-05-2017-Twinning - **FASTER** (CSA) - Institution de la Recharge et de l'enseignement Superieur Agricoles, Institut National de Recherches en Genie Rural, Eaux et Forets, Agence de Vulgarisation et de la Formation Agricoles

> H2020-SPACE-2018 - **S4Pro** (RIA) - Ecole Nationale d'Ingenieurs de Gabes

17.2.2   France

17.2.2.1   The Partnership Hubert Curien (PHC) Utique[62]

The Hubert Curien Partnerships (PHC) are part of the French Ministry of Foreign Affairs' policy of support international scientific and technologic exchanges. They are implemented with the support of the French Ministry of National Education and Ministry of Higher Education and Research.It has supported Franco-Tunisian interuniversity scientific cooperation for the past 22 years.

This bilateral program is implemented by the Ministry of Higher Education and Scientific Research (MHESR) Tunisia and the Ministry of Foreign and European Affairs and Higher Education and Research, France. Managed by the Department of Cooperation and Cultural Action of Tunis, the PHC Utique mobilizes a mobility operator (EGIDE) and the Center for Research and Higher Education Lyon is in charge of the logistics of research projects since 2005. Coordination, monitoring and evaluation of the program and defining its scientific and strategic directions are provided by the Joint Committee of University Cooperation (CMCU), which consists of fifteen Tunisian experts and fifteen French experts.

The objective of PHC Utica is to develop scientific exchanges of excellence between research laboratories in France and Tunisia, fostering new collaborations and promoting doctoral studies through international cooperation. Covering all disciplines developed in academic research, it is open to private and industrial partners.

Implemented through an annual call for tenders, the program currently funds 113 projects (3 years of research) and involves approximately 300 laboratories between France and Tunisia, with the aim to: train and undertake research; participate in joint research on topics of shared priorities; contribute to the structuring of national research systems and to recognise the emergence of centres of scientific excellence.

Main Partners: Ministry of Higher Education and Scientific Research (MHESR, Tunisia), Ministry of Foreign and European Affairs and Higher Education and Research managed by the Department of Cooperation and Cultural Action of Tunis - EGIDE (France).

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[62] http://www.campusfrance.org/fr/utique

17.2.3   Germany

17.2.3.1 Promotion of Renewable Energies and Energy Efficiency in Tunisia[63]

This bilateral project supported the Tunisian Government in aligning its energy policy with its sustainable development strategy. It also provided advice on how to create an enabling environment that promotes renewable energies and energy efficiency. A key area is its support for implementation of Tunisia's Solar Plan (Plan Solaire Tunisien), which was approved in 2009. The project worked with Tunisia's Ministry of Industry, Energy Agency and other government, private sector and civil society actors.

The project promoted investment in renewable energies and energy efficiency by providing information and technical advice and by supporting relevant projects. Advice was offered to providers of energy technologies and services on how to improve their products and services. Information was disseminated to Tunisian energy consumers on how to use renewable energies, save energy and access funding instruments in these fields. Training was provided to consulting engineers, private companies, architects and public sector employees in the field of renewable energies and energy efficiency. Through development partnerships with the private sector, the project supported European and Tunisian companies in their endeavours to transfer sustainable energy technologies.

Funded by: German Federal Ministry for Economic Cooperation and Development (BMZ)

Lead Executing Agency: Agence Nationale pour la Maîtrise de l'Energie (ANME), an agency of the Ministère de l'Industrie

Project Duration: 2003 to 2013

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[63] http://www.giz.de/Themen/en/dokumente/giz2012-en-erneuerbare-energien-tunesien.pdf

18. REPUBLIC OF UGANDA

18.1   Introduction

The Republic of Uganda is located in East Africa, bordered by Democratic Republic of the Congo, Kenya, Rwanda, Sudan and Tanzania. Uganda has an area of 241,038 km² and 112 administrative districts. The population as at July 2018 was estimated at 40,853 million inhabitants with a literacy rate of 78.4% (CIA World Factbook, 2018). Uganda is one of the countries with the highest population growth rate of 3.2% with the second youngest population in the world. 50.2% of the population is between 15 and 64 years of age. Kampala, the capital city, has a population of 2.986 million (2018 CIA World Factbook). English is the official language.

Uganda is a fertile country with regular rainfall and mineral deposits of copper, cobalt and gold. Oil has recently been discovered. Agriculture remains a dominant sector in the economy. The 2014 Census revealed that a total of 5.8 million households engage in agriculture. More than two thirds (69 percent) of households derived their livelihoods from subsistence farming as the main source of earning. In terms of employment, the majority of the working population (65 percent) are subsistence farmers followed by services and industry.

There is an Innovation friendly Policy Framework, which has actively supported growth in the ICT sector. These include: the National Science Technology and Innovation Policy (2009), ICT Policy 2014, Rural Communications Development Policy and eGovernment Strategy (2011). eInfrastructure is rapidly improving with a national backbone of over 5,000 km of fibre optic cable, National Data Transmission Backbone Infrastructure (NBI) and Electronic Government Infrastructure (EGI) being finalised and links to three submarine cables (TEAMS, SEACOM and EASSy). ICT Initiatives are primarily focused on eInfrastructure, eGovernment, Technology-enhanced Learning, eHealth, eCommerce and ICT for Rural Development and Entrepreneurship. *More information in relation to these activities are outlined in a complementary IST-Africa Study entitled "Report on ICT Initiatives, Research and Innovation Priorities and Capacity in IST-Africa Partner Countries", December 2018".*

In relation to Communications, according to Uganda Communications Commission (UCC) as at June 2018 the number of fixed line subscribers (252,165) and Mobile subscribers (21,648 million) with a teledensity of 56.1%. The mobile internet subscriptions dropped to 9,855.034 million while the fixed internet subscriptions grew to 173,600 by the end of June 2018. The estimated Internet users dropped slightly to 18,502,166 from the19.1 million as estimated in the previous quarter. The Internet penetration now stand 47.4%.

Uganda has a strong research base and good experience in collaborative research with 8 Public Universities, 33 Private Universities, 40 public Tertiary Institutions and 51 private Tertiary Institutions.

18.2   Bilateral & Multilateral Cooperation

Uganda has bilateral cooperation agreements in place with Belgium, Denmark, Germany, France, Iceland, Ireland, Italy, Austria, Netherlands, Norway, Sweden, UK, Rwanda, Burundi, India, China, South Africa, Turkey and South Korea. Belgium has historically focused on supporting interventions in the areas of decentralization, health, environment, education, private sector development and good governance. France has focused on water and sanitation, rural development and civil society with projects managed by AFD. Italy has focused on health, water, education, training and agriculture. Denmark is supporting ICT initiatives through the encouragement of partnerships between Ugandan and Danish companies interesting in outsourcing activities. Belgian Technical Cooperation focus on technical & professional education and on primary health care. Ireland has focused on education, health, governance, agriculture and HIV/AIDs.

Uganda has put a Memorandum of Understanding focused on cooperation related to ICT with Rwanda (CERTs, ID project, public ICT access points, capacity building and BPO), in relation to energy, ICT, trade and investment with Burundi, energy sector, ICT, trade and commerce with India

Support for ICT and Innovation-related activities, supporting Infrastructure and Capacity building in Higher Education Institutions is primarily provided by the European Commission (FP7, H2020, EDF, AfricaConnect, ACP-ICT), Germany, Ireland, Netherlands, United Kingdom, Norway, Sweden, IICD, South Korea

18.2.1   European Commission

The EU has provided long term development support to Uganda through the Contonou Partnership agreement and through European Development Funds. This has supported programmes focused on improving road networks, increasing agriculture productivity, and promoting democracy and good governance by working for peace and stability in the country and surrounding region.

EU development funding to Uganda is financed by the European Development Fund, with the objectives of fostering sustainable development through improved governance and strengthened economic growth. The cycle of 2014-2020 amounts to €578 million. One of its focuses is on transport infrastructure, by supporting the national transport system and an efficient multimodal transport network. It also focuses on food security and agriculture through the promotion of resilience in fragile regions, value chains and green economy, and good governance, by strengthening the financial, democratic and social accountability of the state. Under the previous cycle of funding from 2008-2013, the EU dedicated €479 million to programmes in Uganda, with a focus on transport and infrastructure, rural development and macroeconomic support.

Under EDF10 (2008-2013) €461 million was allocated, with the focal areas including Infrastructure, Rural Development, Macroeconomic Support. Under EDF11 (2014 - 2020) Uganda is allocated €578 million with focal areas including Transport Infrastructures, Food Security and Agriculture, Good Governance.

Through UbuntuNet Alliance and the Uganda National Research and Education Network (RENU), Uganda is a beneficiary of the AfricaConnect and AfricaConnect 2 eInfrastructure project co-funded under EDF10 and EDF11.

19.2.1.1 Framework Programme 7

Uganda was the 9th most successful African country in the 7th EU Research Framework program and in Erasmus Mundus. The Uganda National Council for Science and Technology (UNCST) is a beneficiary of the IST-Africa Initiative since 2007.

The IST-Africa project has facilitated UNCST to host IST-Africa FP7 and Horizon 2020 Training Workshops in Kampala and undertake a consultation with the research community to map expertise. UNCST raising awareness of the potential of Living Labs methodologies in Uganda.

Uganda secured participation in **41** projects with research funding in the region of **€ 7.7 million** under FP7: ICT (6 projects), INCO (2 projects), Environment (6 projects), Health (16 projects), Infrastructure (1 project), Food, Agriculture and Biotechnology KBBE (6 projects), People (3 projects) and Social Sciences (1 project).

18.2.1.2   Horizon 2020

As part of its ongoing IST-Africa activities UNCST promotes awareness on open Calls for Proposals as they are available, mobilises and encourages the research community to explore these opportunities for international research projects and promotes the research centres during international meetings. UNCST established a National Contact Point for ICT, which has also increased visibility of Ugandan research institutions. UNCST hosted an IST-Africa Workshop focused on Horizon 2020 in Kampala in January 2014, a workshop specifically focused on ICT-39-2015 in November 2014 and a further training workshop focused on ICT-39-2017 in December 2016.

Up to September 2018, Ugandan organisations are involved in **23** projects with research funding of **€5.548 million** across a range of thematic areas:

➢ INFRA, H2020-INFRASUPP-2014-2 - **B3Africa** (CSA - Coordination & support action) - Makerere University

➢ HEALTH, H2020-HCO-2015 - **FRESH AIR** (RIA - Research and Innovation action) - Makerere University

- FOOD, H2020-SFS-2014-1 - **PROIntensAfrica** (CSA - Coordination & support action) - African forum for Agricultural Advisory Services & The Registered Trustees of the Association for Strengthening Agricultural Research in Eastern and Central Africa)

- FOOD, H2020-SFS-2014-2 - **PROTEIN2FOOD** (RIA - Research and Innovation action) - Makerere University

- HEALTH, H2020-HCO-2014 - **SMART2D** (RIA - Research and Innovation action) - Makerere University

- H2020-PHC-2015-single-stage_RTD - **EHVA** (RIA)   Uganda National Health Research Organisation

- H2020-WATER-2015-two-stage - **VicInAqua** (RIA)   National Agricultural Research Organisation

- H2020-ISSI-2015-1 - **BigPicnic** (CSA) - Tooro Botanical Gardens

- H2020-WATER-2015-two-stage - **WATERSPOUTT** (RIA) - Makerere University

- H2020-ICT-2016-INT - **IST-Africa 2016-2018** (CSA) - Uganda National Council for Science and Technology

- H2020-INFRASUPP-2016-1 - **UBORA** (CSA) - Uganda Industrial Research Institute

- H2020-SC1-2016-RTD - **SPICES** (RIA) - Makerere University

- H2020-SC1-2016-RTD - **Perform 2 scale** (RIA) - Makerere University)

- H2020-SFS-2016-1 - **LEAP-AGRI** (ERA-NET-Cofund)- Uganda National Council for Science and Technology

- H2020-MSCA-ITN-2014 - **CHIBOW** (MSCA-ITN-ETN) - Facilitation for Peace and Development; All Saints University Lira

- H2020-MSCA-RISE-2015 - **DEMOSTAF** (MSCA-RISE) - Makerere University

- H2020-MSCA-RISE-2015 - **SYBAWHEY** (MSCA-RISE) - Afribanana Products Limited; Kyambogo University

- H2020-ICT-2017-1 (ICT-39-2017)- **EPICA** (IA) - Makerere University; **ISOOKO** (IA) - Makerere University; **WAZIHUB** (IA) - Hive Colab; Women in Technology Uganda

- H2020-SC1-2017-Single-Stage-RTD **- UPSIDES** (RIA) - Butabika National Mental Hospital

- H2020-SC5-2017-OneStageB - **TWIGA** (RIA) - Makerere University

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- H2020-SFS-2018-1 - **LEAP4FNSSA** (CSA) - Regional Universities Forum for Capacity Building in Agriculture Limited (forum) by guarantee, The Registered Trustees of the Association for Strengthening agricultural research in Eastern and Central Africa

18.2.1.3   Africa4All Parliamentary Initiative

Target Countries: Eastern and Southern Africa with pilots in Kenya, Tanzania, Uganda, Lesotho, Namibia

Main partner: Gov2u

Partner in Kenya: National Assembly of Uganda

Funding: 410k€ from EDF9 (@CP-ICT capacity-building programme) 2009-2011

19.2.1.4 TACIT: Tackling Aids and Tuberculosis through Communication and Information Technologies

Target Countries: Southern and Eastern Africa, pilots in Kenya, Zambia, Uganda and Namibia

Main partner: International HIV/Aids Alliance

Funding: 960k€ from EDF9 (@CP-ICT capacity-building programme) 2009-2011

18.2.1.5 Prepare PhD Project

The PREPARE-PhD project was a three-year (2008-2011) multi-country project funded by the European Union under the ACP-EU Cooperation Programme in Higher Education (EDULINK). This project was part of STRAPA Partnership.

The purpose of the project was to create efficient and effective PhD training systems through strengthening local research capacity and regional networking in the participating higher education institutions (HEI). The key outputs of this project include development of harmonized guidelines for PhD training in the region, supervision and mentoring skills that have been strengthened as well as Makerere University PhD students formed an Association, called the PhD Forum: PF@mak in June 2012. The association for the first time has brought together PhD students from all disciplines at Makerere to share knowledge, experiences and networking.

Main partners: Makerere University, Uganda, Sokoine University of Agriculture, Tanzania, University of Nairobi, Kenya, and University of Copenhagen, Denmark.

Funding: ACP-EU Cooperation Programme in Higher Education (EDULINK), 2008 – 2011

18.2.2 Germany

Germany has supported infrastructure for ICT Initiatives as part of its focus on Education and Capacity Building. As part of a project funded by KfW on behalf of German Federal Ministry of Economic Cooperation (BMZ), €2 million was allocated to put PCs in Vocational Training Centres.

Germany is Uganda's principal EU trading partner (€200 million in trade in 2011), ahead of the Netherlands and Belgium. Bilateral trade with Uganda shows a €20 million surplus in Germany's favour. Uganda's main exports to Germany are coffee, fish, small quantities of other agricultural produce, cobalt and simple technical products. Uganda's main imports from Germany are machinery and chemical products. At the Ugandan-German intergovernmental negotiations in May 2010, a new commitment of €120 million was agreed for a three-year period (€100 million for financial cooperation and €20 million for technical cooperation), an increase of 58 per cent compared with the previous commitment period.

Ugandan-German development cooperation is aligned with Uganda's Vision 2040 and the National Development Plan II. It focuses on the priority sectors: water supply and sanitation, financial system development and the promotion of renewable energy and energy efficiency. Germany supports the implementation of Uganda's National Development Plan through budget financing.

The German Federal Government's main objective is to provide expert advice and conducting peacekeeping operations in the north of Uganda and to provide development-oriented emergency and refugee relief in Uganda's Karamoja district.

Government development cooperation is implemented by the KfW Development Bank (Financial Cooperation), the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and the Centrum für Internationale Migration und Entwicklung (CIM).

The European Union (EU) and the Federal Republic of Germany have committed grant financing of Euro 36.4 million (UGX 160 billion) to support Ugandan civil society organisations and to promote rural development as well as climate smart agriculture, particularly in Northern Uganda.

The two programmes "Civil Society in Uganda Support Programme" (CUSP) and "Promoting Rural Development in Northern Uganda" (PRUDEV) are implemented by the German implementing agency, Deutsche Gesellschaft für Internationale Zusammenarbeit - GIZ. They are co-funded by the European Union (€30 million) and the German Federal Government (€6.4 million).

CUSP will be implemented nationwide by GIZ and has a strong focus on technical assistance and capacity development to strengthen Civil Society Organizations and to promote their interaction with relevant state institutions. The aim is to contribute to environment conducive for civil society participation in the development of Uganda. The programme will support organizations providing services in a wide range of sectors, such as infrastructure, water, energy, rural development, and good governance with a special focus on women and youth.

18.2.2.1 ict@innovation Open Source Regional Project

ict@innovation[64] focused on building capacities in African Small and Medium sized ICT enterprises in relation to using Free and Open Source Software (FOSS) by spreading FOSS business models for enterprises in Africa, fostering FOSS certification and supporting innovative local FOSS applications for social and economic development.

Target Countries: Eastern and Southern Africa (Kenya, Malawi, Mozambique, Rwanda, South Africa, Tanzania, Uganda, Ethiopia, Namibia, Zambia)

Main partners: Partnership of FOSSFA (Free Software and Open Source Foundation for Africa) and InWEnt - Capacity Building International on behalf on behalf of German Federal Ministry of Economic Cooperation (BMZ), the Open Society Initiative for Southern Africa (OSISA).

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[64] http://www.ict-innovation.fossfa.net/

Funding: €1.6 Million from German Federal Ministry of Economic Cooperation (BMZ), 2008 – 2010 first phase

18.2.3 Ireland

Ireland has focused on education, health, governance, agriculture and HIV/AIDs.

18.2.3.1 Irish-African Partnership for Research Capacity Building

The Irish-African Partnership for Research Capacity Building (2008-2011) brought together all nine Irish Universities and four Universities in Uganda, Tanzania, Mozambique and Malawi to develop a coordinated approach to Research Capacity Building in higher education institutions. The IAPRCB aimed:

1. To build the capacity for development research in Irish and Northern Irish universities

2. To build the capacity for research in the four African universities in health and education, and the cross-cutting themes of ICT and gender.

The Partnership was funded as a pilot project under the Programme of Strategic Cooperation between Irish Aid and Higher Education and Research Institutes (2007-2011). It was organised under the umbrella of Universities Ireland, which also provides some matching funding.

The administrative leader of the Partnership is the Centre for Cross Border Studies, with offices in Armagh and at Dublin City University.

Target Countries: Uganda, Tanzania, Mozambique and Malawi

Partners: Participating higher education institutions: University of Dublin/Trinity College, Queen's University Belfast, Dublin City University, University of Limerick/Mary Immaculate College, University College Dublin, University of Ulster, National University of Ireland Galway, National University of Ireland Maynooth, University College Cork, Makerere University (Uganda), University of Dar-es-Salaam, Universidade Eduardo Mondlane (Mozambique), University of Malawi, Centre for Cross Border Studies

Funding: Pilot project, Irish Aid with matching funding from Irish Universities

18.2.4 Netherlands

Netherlands has focused on education, decentralization and governance.

18.2.4.1 NPT Project on 'Strengthening ICT Training and Research Capacity in the Four Public Universities in Uganda'

The initial Nuffic project completed in 2008 and focused on addressing Information and Communication Technology (ICT) capacity building in the four Public Universities in Uganda. The target group was the staff and students in the Ugandan institutions and mid-career ICT professionals. The project provided expertise from the Netherlands to support curriculum development and implementation, development of research capacity and to advise in the

establishment of a Centre of Excellence for ICT Training and Research. 38 members of staff from the four universities were trained and a few are in the final stages of their studies in the Netherlands and in Uganda. This grant provided funding of €3.4 million euro.

A follow on project proposal was approved, which is focused on strengthening the Capacity of Makerere University Faculty of Computing and IT, the Institute of Computer Science at Mbarara University of Science and Technology, the Departments of Computer Science at Kyambogo and Gulu Universities to develop, implement and manage relevant educational and research programmes for poverty alleviation, rural and economic development.

The target group was University staff and students in the above institutions and ICT Policy makers.

Main partners: The lead institution in Uganda was Makerere University with Mbarara University of Science and Technology, Gulu University and Kyambogo University as partners; and the lead institution in the Netherlands was the University of Groningen with Radboud University Nijmegen (RUN) and Eindhoven University of Technology (TUE) as the consortium partners.

Funding and Duration: The project was implemented over four years, commencing in 2008 with a maximum Nuffic grant of 5.7 million euro. The southern partners were to contribute to the project in form of financial and material inputs such as complementary funding and equipment, physical infrastructure and human resources. It was expected that at completion, the total project cost would be €6.2 million.

18.2.4.2 NPT Project on 'Strengthening the Institutional Capacity of Uganda's Technical Colleges

As a result of the initial Nuffic project with the four universities, a project was subsequently awarded by Nuffic to the four technical colleges in Uganda: Uganda Technical College (UTC) Bushenyi; UTC Elgon; UTC Kichwamba and UTC Lira to building institutional capacity.

Main partners: The Lead institution in the Netherlands was Hanze University Groningen. Co-partners in Uganda were Makerere University and Kyambogo University.

Funding and Duration: This project ran from 2006 – 2009 with a Nuffic grant of €1.99 million.

18.2.5   United Kingdom

The UK has focused on governance, health, education and water and sanitation.

18.2.5.1 Mobile Innovation and Enterprise

The *Mobile Innovation and Enterprise project* aimed to respond to the fast growing mobile market in the country in particular and in the region in general. It aimed to blend teaching on mobile computing and innovation with experiences of entrepreneurship and user-centered design hoping to develop a cohort of young minds who have the skills to lead Ugandan innovation in mobile sector. Specific key expected outputs of the project included:

1. A cohort of students with skills in mobile computing, user-centered design, entrepreneurship and innovation.

2. A structure for continuing the training to develop more students in future years.

3. A group of staff at Makerere who can lead skills development in mobile computing, user-centered design, entrepreneurship and innovation.

4. A new set of relationships between Makerere and local and international businesses, non-governmental organizations and community organizations.

5. A business plan to develop a mobile business incubation centre at Makerere where graduates will work with local and international businesses to develop innovative mobile phone business concepts and spin outs.

Main Partners: College of Computing and IT at Makerere University and the Faculty of Arts, Computing, Engineering & Sciences at Sheffield Hallam University, UK. Private sector partners included Orange Labs and DMark Mobile

Funding: Grant from British Council's competitive Educational Partnership in Africa Programme

18.2.6   Norway

Norway through the Norwegian Agency for Development Cooperation (Norad) has provided significant support to the ICT Department in Makerere University providing a new ICT building and the provision of administrative software systems for Finance, Academic Records and Human Resources.

18.2.6.1 *Makerere University Institutional Development Program*

Norwegian Support to Makerere University dates back to the 1960s (with Department of Botany in the Faculty of Science and Department of Forestry then under the Faculty of Agriculture and Forestry). After a 15-year period (1970-1985) of political instability, support was renewed in mid 1990s to the then Department of Forestry under the Faculty of Agriculture. This support resulted in the development of a fully-fledged Faculty of Forestry and Nature Conservation at Makerere. The support helped to resource the new Faculty in terms of building, equipment and human resource development.

In 2000, this scope of the support was expanded to cover the entire University's Institutional Development Programme for an initial 5-year period. The support agreement was signed on 28 June 2000 with a total grant of 110m NOK. A new bilateral frame agreement between the Government of Uganda and Government of the Royal Kingdom of Norway for continued support was signed on 27th October, 2005 for four years (2005/06 – 2008/09) worth 60m NOK (approx.US$9m). Priority areas for continued Norwegian support were discussed and agreed upon between Makerere University and the Norwegian Embassy in Uganda. These priorities were in line with the University's strategic plan 2000/01-2006/07 and the Government over-aching policy of Poverty Eradication Action Plan (PEAP).

Norwegian support over this period was initially channeled through the Norwegian Agency for International Development (NORAD). The support has introduced important interventions aimed at relating higher education to the needs of society by supporting the development of human resources in various fields and increasing the practical orientation of the graduates. Through synergies with other partners, the support has enhanced the University's delivery capacity and also facilitated innovations and quick response to the changing needs of society.

The support has greatly helped in expanding physical infrastructure which in turn has facilitated the university to cope with increased demand for higher education; development of the human resource in various fields; contribution to ICT-enabled operations in administration and Library service delivery; enhanced capacity for gender mainstreaming; refurbishment of laboratories with specialized scientific equipment; strengthened research and research coordination: publication, outreach activities, institutional collaboration, partnerships and networking.

The main objectives in relation to the different Program components included:

A: Good governance and Gender Mainstreaming - To promote research, design curriculum and engage institutions for good governance with gender equality starting with Makerere University itself.

B: Food, Nutrition and Value Addition - To promote scientific research, design curriculum and engage both public and private sector to enhance food production, nutrition and value addition.

C: Strengthening University Management - To improve efficiency and effectiveness through strengthening the planning, development and human resource management functions at Makerere University.

D: Development of infrastructure and ICT - To expand space, ICT infrastructure to support the University's teaching, research and outreach function in critical areas for national development

18.2.7   Sweden

The bilateral research cooperation with Uganda was initiated in 2000. Its main objective is to enhance research and research training capacity of public higher education institutions to conduct and sustain strategic and quality research, which can contribute to national development needs, through building a critical mass of independent thinking researchers. The purpose was to build capacity at Makerere University, the largest public university in Uganda by supporting Masters, PhD Programmes and postdoctoral training in relevant fields (e.g. basic science, technology, agriculture, health, veterinary medicine, social sciences and humanities) and to strengthen the institutional capacity for research management. The 2010-2014 support focused on collaborative research and PhD research training at Makerere University as well as building an enabling environment for research which includes improvement of research management capacity, administrative and financial systems, library services, research funds, ICT, demographic surveillance site, laboratory infrastructure, and gender mainstreaming. In addition, support will target administrative reforms, quality assurance of postgraduate training, research communication and dissemination, the

Innovation Systems and Cluster Program in Uganda, and PhD and Masters training at Makerere University for staff from four other public universities in Uganda. The programs are implemented in collaboration with Swedish universities and research training will be conducted both in Sweden and in Uganda.

Sweden is supporting ICT initiatives through projects supported by SIDA and the SPIDER Programme.

SIDA is supporting Makerere University to incorporate ICT in all its functions; to provide Internet connectivity to research groups supported by SIDA long-term research co-operation; to build technical and managerial capacity in information technology at all levels; and to integrate ICT in the main library operations.

To a large extent the goals of this project have been met, and in cases where they are not yet completed, plans have been adjusted to address the needs in the next project phases.

DICTS: The Directorate for ICT Support has been created and is functioning relatively well. The unit has been quite well accepted on campus, and their leadership role is appreciated. As is typical with this type of operation, they are somewhat short staffed (a combination of requiring specialized skills and lack of sufficient budget).

Makerere-net: The campus network was designed, installed and is functioning as per expectations. The actual connection to the Internet is funded by the University and not SIDA. The connection speed has increased in recent years as the per-unit cost of this bandwidth has dropped.

Research Local Area Networks: These networks were all installed and are operational.

E-*mail and web infrastructure:* The core web services applications (e-mail, web servers, network infrastructure) are in place and operational. Most staff members and many students have access to Makerere e-mail addresses, although there is still heavy use of non-Makerere addresses (such as Yahoo). The Makerere web site is active.

End User Training: The original plan was to provide basic computer training for all academic staff, administrative staff and students within one year, and that the majority of the training would be computer-based (no instructor). This plan was overly ambitious and the target was not met. The training program was re-aligned to include classroom instruction. To date, about half of the staff have been trained. As of the 2004/5 academic year, all entering students must complete a basic ICT training course. Staff training is continuing, and is expected to take several more years to complete.

Library Automation: A library management system was selected, installed and is now online. The conversion of the card catalogue has taken longer than expected, and that project is ongoing. The other functionality of the system, including all of the internal library functions, is slowly being implemented.

Access to Electronic Journals: Prior to this project, only paper journals were available. Due to the price and delivery problems, their use was limited. The e-journal project has made nearly 8,000

journals in a wide range of disciplines available, and this has virtually revolutionized Makerere's ability to produce world-class research.

Doctoral Training: This aspect of the project was subject to many delays and has only recently gotten underway in a substantive way. The delays were largely due to the inability of Makerere to release staff from their regular duties. The ability to release staff is still an ongoing problem. For a number of reasons, it appears that these doctoral programs will not result in increased research capacity, but rather on sustaining and improving the level of ICT-based services at Makerere.

The Swedish development cooperation with Uganda focuses on:

- Democratic governance, including peace and security
- The health sector
- Private sector development, including international trade and financial systems
- Research cooperation

Two former sectors are already phased out: the energy sector and the water and sanitation sector. The reason for this is that Sweden shall have fewer cooperation sectors in accordance with policies regarding aid effectiveness and division of labour among donors.

Support to Bilateral Research Cooperation
The Makerere-Government of Sweden Bilateral Research Program

Makerere Research Capacity Building Programme supported by Government of Sweden started in 2000 with a preparatory period and was followed by three more phases of support, Phase 1 2001-2005, Phase 2 2005-2009, Phase III 2010 to 2014 and Phase IV from 2015 - 2020. A number of units in the University were supported. These included; the former Faculties of Agriculture, Technology, Medicine, Social Sciences, School of Public Health, Department of Mass Communication; School of Graduate studies (SGS)/Directorate of Research and Graduate training, Gender Mainstreaming, Directorate of Information and Communication Technology and the Library.

The Makerere University Government of Sweden Bilateral Research Program (Phase III) had a total allocation of 181million SEK, (USD 25 million) for four years January 2010-June 2014. Phase III complemented the remarkable achievements made creating an environment conducive to high quality relevant research through investment in human resource development, ICT, library resources, laboratory and field site infrastructure. Some of the notable achievements to date include:

a) Established functional field research sites. The Demographic Surveillance Site (DSS) in Iganga/Mayuge is now fully operational. Data collection continues in an area of over 50,000 people involving 16,000 households. The site continues to attract other research projects.

b) Biomedical Laboratory –Department of Pharmacology in CHS. The laboratory now fully functional and can be accessed by students and researchers

c) State of the art GIS unit set up in the CEDAT (formerly Faculty of Technology) - Laboratory now fully functional and can be accessed by interested units

d) In the area of ICT, the optical fibre network covers the main campus, Medicine, MUARIK, MUBS. Computers and LANS set up in supported faculties including student kiosks with 165 computers setup in various units. All (100%) of the university units have web presence compared to 5% in 2000. There are more than 20,000 e-mail users registered on the local mail system compared to 50 in 2000. A functional Online Public Access Catalogue (OPAC) with more than 14,000 journals on line giving access to the most recent literature. The library staff in region e.g. University of Juba trained and supported library automation

e) Increased visibility, acceptability and upward movement of women into leadership positions. Makerere University now recognized as a pace setter in gender mainstreaming in Universities in sub Saharan Africa

f) 196 Ph.D. students, 40 Masters Students under Government of Sweden support. More publications have contributed to improved university rankings. The number of linkages/collaborations is on the rise e.g. Uganda Virus Research Institute (UVRI), Irish-African Research Capacity Building Program (IARCBP), and University of Copenhagen (UC-LIFE) among others.

g) Reduced brain drain - Researchers staying and doing work in Uganda

h) Created centres of Excellence in Makerere University including Health in the area of Malaria, TB, HIV, Mental health, Reproductive health; Technology and engineering in the areas of research in energy and energy conservation (CREEC), Innovative systems and Clusters; Agriculture - Centre for Crop Waste Management; ICT regional centre and Library e-resources.

Phase IV (2015-2020) is focused on strengthening public universities to generate knowledge and promote research uptake National and Regional development, Research in Social Sciences and Humanities; Technology, Innovation and Business incubation; Quality Assurance in Development of Research, Teaching & Supervision; Cooperation with and capacity strengthening of Ugandan Regional Public Universities; and Synergy and coordination between bilateral and regional research cooperation programs. It is focused on seven main objectives.

i. Improve research infrastructure to support a robust environment for research and innovations at Makerere University

ii. Consolidate capacity for PhD training and research at Makerere University and strengthen local PhD training in Public Universities in Uganda

iii. Increase the generation and dissemination of research and research outputs through multidisciplinary teams

iv. Increase the capacity for knowledge translation and innovations

v. Increase partnerships and regional synergies for knowledge generation and sharing

vi. Improve coordination and management of research and knowledge uptake

vii. Increase cooperation with and strengthen capacity of partner public universities

18.2.7.1 Converging ICT4D tools to Promote Public Accountability for Improved Service Delivery & Democratic Engagement

This project focused on promoting public accountability for improved service delivery in the Rwenzori region, in western Uganda. It used local FM radio broadcasting stations as "hubs" for the convergence of information and knowledge provided by internet and mobile technology tools. The broadcast media practitioners and staff from 10 FM radio stations in the Rwenzori region were trained on how to design programs and broadcast relevant content and information that empowers local citizens to democratically engage their leaders for development planning and budgeting as well as how to use online social media tools to undertake research, document and disseminate information. The project also aimed to train 500 rural women and youth leaders who were organised into 14 Advocacy Forums.

Main Partners: Toro Development Network, FrontLineSMS-UK

Funding: 485,000 SEK from SPIDER, July 2012 - June 2014

18.2.7.2 Makerere MobiClass

Given the size of the student population undertaking undergraduate and post graduate studies, Makerere University has made it a priority to leverage online learning. Makerere University has a Learning Management System (LMS), called MUELE (Makerere University E-Learning Environment) running under Moodle. While this platform is accessible on desktops and laptops, it is not fully accessible on all mobile phones because the system is heavy and has a number of features which require adjustment and reworking to enable it usable on mobile devices. The Makerere MobiClass project was intended to make mobile learning a priority for users of the MUELE system by developing suitable plugin, training users, developing appropriate policies, improving instructional designs for learning and formulating better strategies for mobile and e-Learning. The introduction of MobiClass provide a mechanism for lecturers to be able to frequently interact with their students. One hundred students and 3 lecturers in 5 courses piloted the mobile application of MUELE and participated in the evaluation study.

Main Partners: Makerere University

Funding: 500,000 SEK from SPIDER, June 2013 - May 2014

18.2.7.3 Open access: knowledge sharing and sustainable scholarly communication in Kenya, Tanzania and Uganda

This project aimed to raise visability and accessiblity of research outputs in Kenya, Tanzania and Uganda using free and open source software for open repositories and open access journals in higher education and research institutions. It has developed a sustainable network of open access champions and reinforce local capacity in the management of open access journals and repositories.

Main Partners: EIFL (Electronic Information for Libraries) in cooperation with Kenya Library and Information Services Consortium and Medical Students' Associations of Kenya (MSAKE), The

Network of African Science Academies (NASAC), National Council for Science and Technology, Directorate of Higher Education, Ministry of Education, Science and Technology Kenya; Consortium for Tanzania Universities and Research Libraries and Ifakara Health Institute (IHI), Sokoine University of Agriculture (SUA), University of Dar es Salaam (UDSM), Muhimbili University of Health and Allied Sciences (MUHAS), Ministry of Health and Social Welfare (MoHSW) and Tanzania Commission for Science and Technologies (COSTECH); and *Consortium of Uganda University Libraries (CUUL) and Inter-University Council for East Africa (IUCEA), National Council for Higher Education, National Information Technology Authority Uganda (NITA-U), Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), Research and Education Network of Uganda (RENU) and Uganda National Council for Science and Technology (UNCST)*

Target Countries: Uganda, Kenya, Tanzania

Funding: 500,000 SEK from SPIDER, June 2013 - May 2014

18.2.7.4 iParticipate Uganda

iParticipate aimed to share information, making it accessible and reusable by stakeholders such as citizens, civil society and the media, repackaging the information and availing it online and in print, generating evidence on the impact of information access and use on transparency and accountability, engaging lawmakers to embrace open governance, building skills and knowledge for citizens to access and gainfully use open data and public domain information.

Main Partners: Collaboration on International ICT Policy for Eastern & Southern Africa (CIPESA)

Funding: 500,000 SEK from SPIDER, July 2013 - October 2014

18.2.7.5 ICT4Public Accountability & Democratic Engagement in Uganda & Kenya[65]

This project is focused on supporting citizen engagement in relation to public services in Uganda and Kenya. An E-participation model leveraging MobileSMS-Radio-Internet technologies is to be tested in Nakuru County in Kenya with lessons learned from Uganda from ToroDev's previous Spider project. In Uganda it will scale up the use of the eParticipation model in 5 South Western districts and other 5 northern Uganda districts. It aims to support active citizen involvement on the status of government service delivery and public resources utilisation. It aims to support evidence/priority issue-based planning and budgeting processes for improved public service delivery. This project is expected to run from March 2016 to September 2018.

Main Partner: Toro Development Network

Funding: SPIDER Programme (Funded by SIDA)

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[65] https://spidercenter.org/project/ict4public-accountability-democratic-engagement/

18.2.7.6 Open access policy development in Kenya, Tanzania and Uganda to make more digital content available[66]

This project aims to continue supporting the 16 Universities previously involved in the "Open Access in East Africa" project leveraging the Open Access repositories, journals and existing infrastructure. EIFL will continue to work with the Universities and their senior management to put more policies focused on open access to research outputs in place. It will instigate institutional Open Access policy task forces, which can take responsibility for implementing Open Access policies, workshops, webinars and capacity building events. This project is expected to run from April 2016 to March 2018.

Main Partner: EIFL – Electronic Information for Libraries

Funding: SPIDER Programme (Funded by SIDA)

18.2.7.7 E‑Learning and Multimedia Technology for Mathematics and Basic Health education in Nakivale Refugee Camp, Uganda[67]

This project aims to improve student's mathematics skills and basic health education in six schools in Nakivale refugee camp in south-western Uganda. Teachers will receive training in pedagogy and how to incorporate ICT within their lessons. The aim is that over a year teachers and student peer educators will produce and integrate digital content within the curriculum. It aims to leverage the AKVO RSR digital reporting platform. It aims to support 20 teachers, 12 student peer educators and 1452 students. This project is expected to run from November 2017 to September 2019. It is a Public Private Partnership with MUST as the lead, Uganda Ministry of Education and Sports, Istreams Software Development Company and Africell Internet Provider.

Main Partner: Mbarara University of Science and Technology (MUST)

Funding: SPIDER Programme (Funded by SIDA)

18.2.7.8 Media for Transparency and Accountability in Uganda[68]

This project aims to build capacity among journalists and Civil Society Organisations to improve the coverage of issues relevant to communities. This project is expected to run from July 2017 to June 2018.

Main Partner: Collaboration on International ICT Policy in East and Southern Africa (CIPESA)

Funding: SPIDER Programme (Funded by SIDA)

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[66] https://spidercenter.org/project/eifl_2016/
[67] https://spidercenter.org/project/e-learning-and-multimedia-technology-for-mathematics-and-basic-health-education-in-nakivale-refugee-camp-uganda/
[68] https://spidercenter.org/project/media-for-transparency-and-accountability-in-uganda/

18.2.7.9 Digitalising the Ugandan Sign Language[69]

This project aims to provide access to open source digital learning content for Uganda Sign Language (USL) and a guide for creation of such learning objects. It aims to assist in the mainstreaming of USL to assist deaf students and persons to access education and other services. It aims to build capacity in sign language instructors and organisations working with deaf people. This project is expected to run from March 2017 to February 2019.

Main Partner: UNAD – Uganda National Association of the Deaf

Funding: SPIDER Programme (Funded by SIDA)

18.2.7.10 ICTs and women's socio-economic empowerment for improved service delivery[70]

This project aims to encourage citizen participation to promote accountability and transparency for improved service delivery and democratic governance through the effective and efficient use of appropriate ICT. it aims to support women socio-economic empowerment strategies to improve women's participation in advocacy and democratic governance. This project is expected to run from August 2016 to March 2018.

Main Partner: Women of Uganda Network (WOUGNET)

Funding: **SPIDER Programme (Funded by SIDA)18.2.8 South Korea**

The Government of Uganda through the Ministry of ICT has established collaboration in ICT with the Government of Republic of Korea (ROK) through the National IT Promotion Agency (NIPA) under the Korea Ministry of Knowledge Economy. A delegation from NIPA visited Uganda in June 2012 to begin preparations to provide technical assistance to NITA on the eGovernment Roadmap and Master ICT Plan for Uganda integrating all sectors of the economy.

18.2.9   Carnegie Corporation Support for Institutional Development

The last decade has witnessed remarkable support by the Carnegie Corporation of New York to Makerere University in different phases. Phase 1 run from 2001 to 2005, Phase II from 2006 – 2008 and Phase III from 2008 to 2011 under the thematic area of Food, Nutrition and Value Addition. Over the last decade, the CCNY has supported Makerere University with over USD 16 million.

Overall cumulative progress and impact was made in Library, ICT development and use, gender and equity, human resource development, science practical training & research.

Main partners: Carnegie Corporation of New York, Makerere University, Uganda

Funding: $16 million

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[69] https://spidercenter.org/project/digitalising-the-ugandan-sign-language/
[70] https://spidercenter.org/project/icts-and-womens-socio-economic-empowerment-for-improved-service-delivery/

18.2.10 IICD

18.2.10.1 *Improving Learning Outcomes through ICT*

The "Improving Learning Outcomes through ICT" project ran from December 2011 to 31 December 2014. It focused on improving learning outcomes for girls in particular in primary schools in the Apac District of Uganda through access to ICT. It aimed to train teachers and school administrators in learner centered teaching and learning methodologies, facilitate access to up to date teaching and learning materials, build capacity of teachers, facilitate networking between schools and provide life skills to pupils for improved self confidence. The target group was 100 primary school pupils and 40 primary school teachers.

Main Partners: Connect4Change, Edukans, IICD (Netherlands) and Education Local Expertise Centre Uganda, FAWEU and I-Network (Uganda).

Funding: Grant of €36,000 from Edukans, Netherlands.

Geographic scope and time frame: Apac District of Uganda, December 2011 - December 2014.

18.2.10.2 *ITELE for ICT (Improving Literacy and Numeracy in Primary Education through ICT)*

The "ITELE for ICT" project ran from December 2011 to 31 December 2014. It focused on improving literacy and numeracy in primary education in the Serere District in Eastern Uganda through the integration of ICT in teaching and learning processes. The projects aimed to train 20 teachers in 8 targeted primary schools and then 10 teachers per school by 2014 to develop Information Communication based teaching content, lesson planning and scheming and support pupils to design, develop and disseminate IEC materials that address community needs and concerns.

Main Partners: Connect4Change, Edukans, IICD (Netherlands) and Education Local Expertise Centre Uganda, HNU and I-Network (Uganda).

Funding: Grant of €39,568 from Edukans, Netherlands.

Geographic scope and time frame: Serere District in Eastern Uganda, December 2011 - December 2014.

18.2.10.3 *Helping teachers use ICT for teaching*

The "Helping teachers use ICT for teaching" project ran from December 2010 to December 2015. It focused on training teachers and sensitising Head Teachers in Western Uganda and West Nile of the importance of using ICT for Education and for school management. It trained 400 teachers and senior staff on how to use computers to improve classroom instruction, teaching materials and school administration in 13 schools.

Main Partners: Connect4Change, CharITy, IICD (Netherlands), Close the Gap (Belgium) and Computers for Schools Uganda (CFSU), I-Network (Uganda)

Funding: Funding of €110,820 from CFSU (€18,203), IICD (€35,117), Close the Gap (€47,500) and CharITy (€10,000)

Geographic scope and time frame: Western Uganda and West Nile, December 2010 - December 2015

18.2.11   South Africa - Uganda Joint Research Cooperation

The Uganda National Council for Science and Technology (UNCST), and the National Research Foundation (NRF) of South Africa launched a joint research South Africa – Uganda Joint Research Cooperation Programme.

This collaborative project consists of researchers with a PhD from Uganda and a South African team up to undertaken research in the thematic areas of Renewable energy, Biotechnology (Health and Agriculture), and ICT (Education).

Up to six projects have benefited from this two-year programme, launched in March 2016.

The joint research is part of the ongoing bilateral *Scientific and Technological Cooperation Agreement* signed between the governments of Uganda and South Africa. The programme is managed by the UNCST in Uganda and the NRF in South Africa on behalf of their respective governments.