

# Mathematics in the Bilateral Programmes



# Background and Introduction



Sida Headquarters, Stockholm

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## About Sida

- Sida = The Swedish International Development Cooperation Agency
- Channels a large part of Swedish aid (about 4 billion Euro out of 4,7 billion Euro in 2018)
- **Overall Objective:** Reduce poverty all over the world

# Background and Introduction

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## Bilateral research programmes

- Bolivia, Cambodia, Ethiopia, Mozambique, Rwanda, Tanzania, Uganda
- Support on individual, organisational, institutional level
- Typically very long-term support
- Emphasis on capacity building, ownership, partnership, sustainability
- Many disciplines in every bilateral programme
- **PhD training in the sandwich mode:** For staff members, joint recruitment, full PhD in Sweden, normally 5 years studies, at least 6 months in Sweden per year



University of Rwanda



Makerere University



University of Dar es Salaam



Royal University of Phnom Penh



Universidade Eduardo Mondlane

# The Partners

# The Partners

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	Rwanda	Tanzania	Uganda	Mozambique	Cambodia
Current period	2013-2019	2015-2020	2015-2020	2017-2022	2019-2022
Budget	31 MSEK	10 MSEK	39 MSEK	21 MSEK	9 MSEK
Swedish partners	LiU, SU	KTH, LiU, MdH, SU, UU	KTH, LiU, MdH, SU, UU	LiU, LTU, MdH, OrU, SU, UU	LiU, SU

## Notes:

1. Collaboration with Rwanda started in 2007, while support to Mozambique started in 2006. For other countries, the current period is the first
2. The programme in Mozambique is “trilateral”, involving also South Africa
3. Cambodia application is not yet approved

# PhD Training

Studievägledning

Matematik, MAI



PhD graduates from University of Rwanda, 2017

# PhD Training

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	Rwanda	Tanzania	Uganda	Mozambique	Cambodia
<b>Sandwich students</b>	11 since 2008	3 since 2016	5 since 2016	9 from 2011	1 from 2019
<b>Graduations</b>	6	0	0	3	0
<b>In-house programme development</b>	Joint 2016			2020	Next phase
<b>In-house students</b>	Next phase	4 from 2016	16 from 2017	Next phase	Next phase
<b>Teaching, supervision by Sweden, region</b>	N/A	Yes	Yes	N/A	N/A
<b>Supervision training</b>	2016, 2017	2017, 2018	No	2018	2019
<b>Network meeting</b>	Annual from 2017				

# MSc Training

$$I = ABCD$$

$$D = ABC$$

$$D = -1$$

$$\mathcal{D} = 1$$

	A	B	C	D = ABC
(1)	-1	-1	-1	-1
a	1	-1	-1	1
b	-1	1	-1	4
ab	-1	-1	-1	-1
c	-1	1	1	1
ac	-1	-1	-1	-1

Teaching in MSc programme, University of Rwanda, 2016

# MSc Training

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	Rwanda	Tanzania	Uganda	Mozambique	Cambodia
<b>Development</b>	2007	N/A	N/A	2018	2018
<b>Review &amp; harmonisation</b>	Joint 2016			2021	2021
<b>Teaching, supervision by Sweden, region</b>	Since 2008	Since 2016	N/A	From 2019	From 2019
<b>Schools</b>	IMW	No	No	No	From 2019
<b>Training academic writing</b>	2015, 2017	No	No	2020, 2022	2020
<b>Training supervision</b>	2015	No	No	No	No
<b>Training online teaching</b>	2017	No	No	No	No

# Research Dissemination

The Third Eastern Africa Universities  
Mathematics Programme (EAUMP) Conference:

Advances in

MATHEMATICS

Kenya, Uganda, Tanzania, Rwanda, Ethiopia, Malawi



EAUMP conference, Kampala, 2016

# Research Dissemination

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## Conferences

- Support to EAUMP conference 2016
- Conference on mathematical statistics in Rwanda 2017
- Support to conference on inverse problems in Uganda 2017
- Support to SAMSA conference in Tanzania 2017, 2018
- Annual conference/workshop in Mozambique 2018-2022

## Active conference attendance

- Important component in all countries

# Regional Research Groups



3<sup>rd</sup> Network meeting for Sida-and ISP-funded PhD students and postdocs in mathematics, Entebbe, 2018

# Regional Research Groups

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## Research groups created at Entebbe workshop August 2018

- **Eastern Africa Research Group on Partial Differential Equations and Applications** (Burkina Faso, Ethiopia, Mozambique, Rwanda, Uganda, Zambia)
- **Eastern and Southern African Research Network in Multivariate Statistics** (Rwanda, Sweden, Tanzania, Uganda)
- **Eastern Africa Working Group on Mathematical Modelling – Inverse Problems/PDEs** (Finland, Mozambique, Rwanda, Sweden, Tanzania, Uganda)
- **Mathematical Modelling – Financial Mathematics** (Kenya, Mozambique, Uganda)
- **Partnership for Research in Complex Analysis** (Ethiopia, Rwanda, Sweden, Tanzania, Uganda)
- **Combinatorial Research Studio** (CoRS) (Ethiopia, Madagascar, Rwanda, Sweden, Uganda)
- **Eastern Africa Algebra Research Group** (Ethiopia, Kenya, Mozambique, Rwanda, Sudan, Uganda, Zambia)
- **Bayesian Hierarchical Models. Mixture Distributions and Survival Analysis in Health and Environment** (BaMSE)
- **Operator Theory and Functions Spaces**
- **Operations Research – Optimization and Mathematical Modelling**
- **Biomathematics**

# Research Environment



Workshop on e-resources, Dar es Salaam, 2017

# Research Environment

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	Rwanda	Tanzania	Uganda	Mozambique	Cambodia
Seminars	Yes	Yes	Yes	Yes	Yes
Annual workshops	No	No	No	Yes	Yes
Postdocs	Next phase	3	2 per year	2	2 per year
Training e-resources, publication strategies	2015	2017	2016	2018	2019

# Outreach Activities

First Mathematics Competition in Rwanda 14  
March ( $\pi$  day) 2018

# Outreach Activities

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## Activities conducted or planned

- $\pi$ -day in Rwanda since 2018 with AIMS-Rwanda & ICTP-Rwanda
- Mathematics competition in Rwanda since 2018
- UR research & innovation days in Rwanda
- Career days in Rwanda

# The Future

Meeting at Inter-University Council for East Africa Kampala,  
2016

## The Future

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### **The East African Centre for Mathematical Research (EA-CMaR)**

- To be established in 2019 under the **Inter-University Council for East Africa**
- **Nodes from the start:** Makerere University, University of Dar es Salaam, University of Rwanda
- **Mission:** To promote and coordinate research and postgraduate training in Pure and Applied Mathematics in the East African region in order to meet the needs of the society.

# The Future

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## Specific objectives of EA-CMaR:

1. To **promote excellence** in mathematical research.
2. To **facilitate training** of high-quality graduates in Pure and Applied Mathematics in the MSc and PhD programmes in East Africa.
3. To actively **seek for funds** for postgraduate training and research in Pure and Applied Mathematics in the East African region.
4. To contribute to an **increase the use** of Pure and Applied Mathematics in multidisciplinary research projects at universities and in the private and public sectors in the East African region.
5. To **improve gender balance** among students and staff members in the collaborating universities.
6. To **create and promote a regional alumni network** for PhD graduates and postdocs in Pure and Applied Mathematics.
7. To support activities aimed at **popularising Mathematics** and encouraging young students to study and specialise in this subject.



Thank you!

1<sup>st</sup> Network meeting for Sida-and ISP-funded PhD students and postdocs in mathematics, Stockholm, 2017