



UNIVERSITY of  
RWANDA



Sweden  
Sverige

# IMPACT MAG

UR-Sweden Programme for Research,  
Higher Education and Institutional Advancement

Research Capacity

Research Environment

Institutional Advancement



## FROM RESEARCH & INNOVATION TO SOCIAL IMPACT

### MEDICINE

HEPATITIS VIRUSES IN  
RWANDA  
Its implication on liver  
disease

### AGRICULTURE

LEGUME PLANTS  
Benefits to boost fodder for  
livestock and improve soil  
fertility

### BUSINESS

WOMEN'S ECONOMIC  
EMPOWERMENT  
Seizing microfinance  
opportunities through access to  
small loans

MARCH, 2023/ VOL. 03



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## SUPPORT TEAM

**Prof Aline Umubyeyi - Editor**  
**Mr Darius Murangwa - Writer, Design & layout**

**This is a publication of**  
**UR-Sweden Programme for**  
**Research, Higher Education and**  
**Institution Advancement**

**We regret any errors or omission**  
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**made**

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# Editorial

Here comes the 3rd volume of The Impact Mag. In this edition, we will take the reader through some of the research results of our PhD graduates with more focus on the impact they may have on the social and economic transformation of the population. This issue comes at the right time as the UR-Sweden Program marks 20 years of research cooperation between Rwanda and Sweden, a long journey worth celebrating.

Since the release of our previous issue, the UR-Sweden Program has witnessed several milestones including a new phase extension of our partnership from 2019 up to 2024. The phase brought 10 new research sub-programmes with 15 Swedish partner universities. The new phase tackles research areas including, but not limited to, waste management, digital health, undernutrition, water resources, sustainable energy, and infectious diseases.

Despite the effect of COVID-19, which disrupted our activities, through perseverance and adaptation, the program managed to celebrate seven PhD candidates who graduated during the pandemic. We are also pleased that all our activities are now back to normal, which allowed the recruitment of more candidates in our capacity-building portfolio, including 76 PhD and 11 Postdoctoral candidates. The Program's sound impact in terms of capacity-building at an institutional and individual level is indisputable; our next step is to develop strategies towards research uptake. This means creating awareness of the research results using existing communication channels, while maintaining different conventional tools such as magazines, flyers, and posters, as well as organizing research seminars, to mention but a few.

Going forward, we want to see research that can make a significant influence on good practices and decision-making leading to social-economic transformation. For this to happen, translating some of the conducted research into policy and practices to ensure that leaders can make informed decisions is one of our ambitions.



# ANTENATAL CARE

## Its improvement towards reducing maternal mortality through cost effectiveness

More use of evidence from health economic evaluations can help to save lives and improve health in low-income countries. This is shown in Regis Hitimana's research, "Cost Effectiveness of Maternal Health Interventions in Rwanda", conducted as part of a PhD thesis at Umeå University. The research was funded by Sida under the existing partnership between the Government of Rwanda and Sweden through the UR-Sweden Programme.

The research aimed to contribute to the use of health economics' evidence for informed decision-making in low-resource settings, using pregnancy care in Rwanda as a case study. Different methods have been used to investigate the cost and health outcomes of the pregnancy care programme in Rwanda. Those methods include - measurements of Health-related quality of life using a standard tool; estimation of effects from a policy change using expert opinions; using simulation techniques to project future use of services and systematic review of health economics evidence. Those methods are not new in the literature, but they are rarely used in low-income countries.

The key message from this research is that health economic evaluation methods can produce results that support healthcare decisions, with the potential to save lives and improve health in low-income countries. The findings suggest that women who adequately attended the pregnancy care programme had a better health-related quality of life. They also call for expanding the pregnancy care programme, which includes increasing the number of consultations from four to eight and having at least one ultrasound scan, which would be a wise investment. It would require more investments, in Rwanda between \$ 6 million and \$ 11 million, but can save more lives of mothers and babies during their last weeks of pregnancy and the first week after birth.

A recommendation from the research is that the Government of Rwanda should improve pregnancy care. The implementation of those changes should consider, however, the imperative of making the service more convenient for pregnant women. It was found that already



### Regis Hitimana, PhD

PhD graduate at Umeå University .  
Currently Deputy Director General of Rwanda  
Social Security Board

pregnant women spend a lot of time seeking care; four and a half hours on average.

Another recommendation is that more research that is relevant to the contexts of low-resource countries, especially health economic analyses, should be produced and findings used in health policy decisions. Low-income countries could highly benefit from more use of health economic evaluations because they still bear the high burden of mortality and diseases. Insufficient financial resources should not be a barrier to doing such studies, since there are low-cost methods of generating evidence, including systematic reviews and modelling among others.



## TECHNOLOGY-ENHANCED FORMATIVE ASSESSMENT TO PROMOTE STUDENT SELF-REGULATED LEARNING

Higher education in many countries including Rwanda is making various efforts to effectively practice formative assessment. However, there is a diversity of factors that hamper the process and lead to undesirable outcomes. One of the challenges is the design and development of assessment activities that truly inform the teaching and learning process. Such was Bernard Bahati's motivation to conduct research, using technology-enhanced instructional interventions, as an attempt to address factors behind ineffective practices of formative assessment in higher learning institutions. New teaching and learning strategies were introduced through the design and iterative implementation of three instructional interventions in real learning and teaching settings. The research was conducted at Stockholm University under the support of the Swedish International Development Cooperation Agency-Sida as part of fulfilling PhD degree requirements.

In his research, Bahati developed technology-enhanced instructional interventions to support the student-based formative assessment that promotes self-regulated learning. The research was carried out in the context of breaking the assessment routines and attempting some ICT-based solutions to enable and support formative assessment practices. His study revealed that academic regulations put lecturers and students under the pressure of meeting deadlines. This, coupled with the heavy workload of academic staff, leads most lecturers to focus more on the structure and progression of the module than they are preoccupied with matters relating to the status of student learning progress and development, which is the main purpose of formative assessment. The study also pointed out that lecturers gave feedback to students in the form of marks only, and comments were very few or even absent. Limited in-class oral feedback was due to practical constraints related to limited class time and large class size. Unclear lecturers' written feedback and comments were also underlined; students affirm that they have difficulty capturing the real meaning behind lecturers' written comments.

### The potential of adding technology to instructional assessment practices

According to the research, technology has the potential of providing students with the flexibility of completing assessment tasks anytime, anywhere. This enables them to measure their understanding when and how often they want. It also allows students to freely review their weaknesses, and make mistakes without exposing themselves to the instructor or peers.

Drawing on some other previous research studies, the present study suggests that to be effective in online instructional assessment, an instructor needs to change from "teacher-centred to student-centred, low interactor to high interactor, and low initiator to high initiator", from being the sole expert to facilitator, coach or mentor. All in all, online learning requires a profound pedagogical paradigm shift "from systems



### Bernard Bahati, PhD

PhD graduate at Stockholm University currently Director General of the National Examination and School Inspection Authority

of teaching and supervision of learning to systems of learning and facilitation of learning".

Overall, the research proposes three improved formative e-assessment packages: an online knowledge survey, online peer scaffolding through student-generated questions and peer responses, and electronic reflective journals. In addition, based on the findings, the study suggests a set of design guidelines and lessons learnt to inform other educational practitioners who would like to develop technology-enhanced formative assessment activities that promote student-regulated learning.

**Unclear lecturers' written feedback and comments was also underlined; students affirm that they have difficult capturing the real meaning behind lecturers' written comments.**



## EFFECTIVE CROSS-BREEDING

Increasing production  
in milk and meat



### Maximillian Manzi, PhD

PhD graduate at the Swedish University of Agricultural Sciences. Currently a Researcher at Rwanda Agriculture Board

Rwanda has made tremendous strides in rebuilding its livestock sector in the last two decades since 1994. According to the Rwanda Ministry of Agriculture, the cattle population is estimated at 1.3 million heads, of which 45% are indigenous breeds, 33% crossbreds and 22% exotic breeds. The total cattle population has increased more than twice from the pre-1994 level of below 600,000 heads. The same data indicates that if the cattle population grows at the current pace with unchanged production per animal, the country will end up in an unsustainable situation where the gap between supply and demand will continue to widen with time. Maximillian

Manzi, a researcher at Rwanda Agriculture Board evaluated how effective crossbreeding could be for increasing productivity in meat and milk production in Rwanda while preserving indigenous cattle which are more resistant to endemic diseases but also for conservation purposes.

The cattle breed are not selective grazers and can withstand periodic food shortages better than the exotic breeds, based on the adaptive capacity to walk long distances in search of pasture and have got an added advantage of producing high-quality beef. Unfortunately, this desirable trait is not matched with the productivity traits of growth and lactation. Thus, the need for a functioning breeding programme to improve the Ankole cattle.

The major method of crossbreeding has been the use of artificial insemination (AI). Despite the gains made in milk production under the current strategy, there are also fears that indiscriminate crossbreeding and breed substitution creates a progressive disappearance of indigenous breeds. Continued unchecked, this would lead to the eventual loss of genetic diversity that is important in mitigating any unpredictable change in socio-economic needs, environmental conditions and production objectives.

Manzi evaluated the Ankole cattle's cross breeds with four exotic breeds: Brown Swiss, Holstein Friesian, Jersey and Sahiwal (S). Ankole is used as a dam line due to high adaptation to

adverse environmental conditions, including tolerance to heat and resistance to endemic diseases.

The study concluded that crossbreds with Ankole excelled both due to the heterotic effect and additive effect. Essentially, Ankole crossbreds with Holstein Friesian, Jersey, and Sahiwal can be beneficial even under a management system of limited nutrition in Rwanda.

In his research, Manzi calls for appropriate livestock policies and due consideration to be given to the development of indigenous livestock breeds. A systematic study of the outcomes of the current cross breeding programme has to be carried out in association with an efficient herd-recording scheme to inform the national conservation programme.

Besides, the research raised the need to ensure that the productivity gains associated with crossbreeding do not compromise the conservation of Animal Genetic Resources (AnGR), the ecological integrity of the environment and social equity in the distribution of resources in the quest for improved economy and livelihoods.

This study has been conducted as PhD research from the Faculty of Veterinary Medicine and Animal Science Department of Animal Breeding and Genetics at the Swedish University of Agricultural Sciences. The study was funded by Sida under the University of Rwanda-Sweden Programme.





# CONTROL AND MANAGEMENT

## Potato and banana bacterial diseases

**According to data from the National Institute of Statistics of Rwanda, bananas and potatoes are the main staple food crops grown in the country. However, these crops are threatened by diseases, the most worrying being xanthomonas wilt in bananas and bacterial wilt in potatoes. Florence Uwamahoro, a PhD graduate at the Swedish University of Agricultural Sciences (SLU) investigated the severity of the diseases while providing farmers with knowledge and control mechanisms.**

Potato bacterial wilt and banana xanthomonas wilt are major diseases that can cause crop losses of up to 100%. The diseases are worrisome in the sense that there is no single method to control them effectively, resulting in total yield losses if management strategies are not implemented properly.

For the proper management of any kind of disease, a detailed study on the status of the disease, the causal organism, the mode of spread and risk factors associated with that disease in a given area is of paramount importance. The research found that banana xanthomonas wilt and potato bacterial wilt are widely distributed in Rwanda. This distribution of the diseases was influenced by factors including farm locations, farming practices and farmers' knowledge and attitudes.

Factors like high altitude, low planting density, avoidance of sharing farm tools, crop rotation and intercropping potatoes were associated with low potato bacterial wilt occurrence. On the contrary, intercropping bananas, brewing banana types, dense spacing and indigenous banana cultivars were important factors associated with high banana xanthomonas wilt incidence and severity.

Factors like high altitude, low planting density, avoidance of sharing farm tools, crop rotation and intercropping potatoes were associated with low potato bacterial wilt occurrence. On the contrary, intercropping bananas,

brewing banana types, dense spacing and indigenous banana cultivars were important factors associated with high banana xanthomonas wilt incidence and severity.

Florence's study showed that awareness of the detection, spread and management of these diseases among farmers are critical issues that result in improper management practices. These are attributed to limited extension services since the majority of farmers received information about these diseases by word of mouth from other farmers or their relatives.

"Farmers' knowledge on banana xanthomonas wilt and potato bacterial wilt is scarce and haphazard, which is a result of the quality of information that they use" accounts for the research, adding that the major sources of information are fellow farmers, which leads to insufficient disease management attitudes. It was also found that awareness by the farmers of new technologies, the applications and the benefits as well as risks and costs are key in farmers' adoption of the technologies.

The research was carried out as part of PhD thesis and was funded by Swedish International Development Cooperation Agency (Sida) through the UR-Sweden Programme for Research, Higher Education and Institutional Advancement.



**Florence Uwamahoro, PhD**  
PhD graduate at the Swedish University of Agricultural Sciences. Currently a Senior Lecturer at the University of Rwanda

# BEST MECHANISMS TO IMPROVE IMPLEMENTATION OF E-GOVERNMENT SERVICES IN RWANDA

The move to online government services gained a significant impetus in recent years in Rwanda. Currently, a big number of government services can be accessed through a one-stop online portal. In the pursuit of an effective e-Government services system, there have been issues related to infrastructure and organisation towards its implementation. The challenges observed through the implementation of e-Government in Rwanda prompted Pierre Bakunzibake, a University of Rwanda staff, to conduct related research for his PhD thesis. He recently earned his PhD degree at Örebro University in Sweden under the support of the Swedish International Development Cooperation Agency-Sida through the UR-Sweden Programme.

From his research topic “Improving Implementation of e-Government Services in Rwanda, an Organisational Perspective”, Bakunzibake analyses the implementation of e-Government services in a developing context. He found out that e-Government is not only constrained by political, social, economic or infrastructural challenges but also by organisational issues.

The research takes case scenarios where in some developing countries e-government services have been often resulting in unsatisfactory outcomes and even total failures because of adopting modern ICTs from developed countries. Indeed, the failure is attributed to decision-makers and professionals in developing countries who are often inspired and influenced by e-government literature and best practices in developed countries. But from the very beginning, developed countries have been developing their institutions using ICT all along in enabling conditions.



## PIERRE BAKUNZIBAKE, PHD

PhD graduate at Örebro University. Currently a Senior Lecturer at the University of Rwanda

The research analysed different cases including a one-stop e-government system in Rwanda that provides online services for the central and local government agencies to the general public via a single portal known as ‘Irembo’. It was shown that the implementation of e-government services has been focusing on the digitalisation of services superimposing ICT over existing structures with less attention to organisational change issues related to processes, organisational structure and policies.

To make e-Government more efficient, the research suggests several recommendations including adjusting organisational structure such as regulatory framework and improving policies enabling the harmonisation of public information related to services. It also recommends setting up clear operation goals in the local government and striving to achieve them while improving ICT infrastructure in some agencies. Elaborating formal approaches for balanced monitoring, paying attention to the benefits of end users and those of the service providers, was also considered a vital move to improve online services.

The research ultimately helps decision-makers in Rwanda and similar countries undertaking one-stop initiatives to understand the problem context of actions taken towards IT-driven institutional reform. Resources assessment, contextualization as well as addressing organisational issues associated with implementations were therefore reckoned significant amid the introduction of new technologies.

**To make e-Government more efficient, the research suggests a number of recommendations including adjusting organizational structure such as regulatory framework and improving policies enabling the harmonization of public information related to services**





# LEGUME PLANTS

Benefits to boost fodder for livestock and improve soil fertility

During the experiment, legume trees were grown to assess their growth, biomass production and nutrient concentration under different cutting managements. Cutting height did not affect the nutrient content of the leaves. When used to supplement a basal grass diet for the livestock, all the species improved the nutrient quality by increasing the diet's nitrogen content in the feed.

In the process, *A. angustissima* and *L. pallida* appeared to be robust species for use in agroforestry systems with poor biophysical conditions. *Acacia angustissima* showed advantages over the other species tested in terms of quick establishment, tolerance to repeated cuttings at different heights, and rapid recovery hence contributing the most, to high biomass production and nutritional composition. In contrast, *Mimosa scabrella* showed rapid establishment but did not survive repeated harvests, especially at low-cutting heights.

Mukangango recommended low cutting as an ideal management practice to farmers aiming for high leaf production by *A. angustissima* and *L. pallida* for use as higher quality fodder and shoot production. The two legume trees are positively tested as suitable agroforestry species to integrate on small and depleted parcels for smallholder farmers as long as their cutting management is driven by the farmer's objectives, e.g., use as fodder, green manure, boundary demarcation, fuel wood, and reforestation.

**Agroforestry using legume trees is reckoned to be the best way to improve soil fertility and boost productivity in a tropical climate. However, tree establishment and appropriate management are challenging, hampering their integration into agriculture and livestock systems. In her PhD thesis, Marguerite Mukangango used an integrated approach to determine the effects of three legume tree species on fodder quality, fertiliser quality of resulting manure and crop yield. The fertility status of the Ferralsol in Southern Rwanda was also determined to evaluate their effects when subject to different management practices.**

Agriculture contributes to more than one-third of the gross domestic product in Rwanda. It also meets 90 per cent of national food needs with 70 per cent of total employment. The rapidly increasing population pressure on the available land has led to land degradation and loss of productivity of arable lands and increased food insecurity. Achieving food security while preventing further expansion of agricultural land is a major dilemma for the country's policymakers. Thus, the need for research that addresses increased farm production and improved agricultural practices.

In her study, Mukangango tested three legume tree species *Acacia angustissima*, *Leucaena pallida* and *Mimosa scabrella* grown on acidic soil with low nutrient content.

"Previous research has shown that *Mimosa scabrella* grown on acidic soils was preferred in Rwanda due to a high nutrient content but little research has been done to evaluate its productivity when subjected to different cutting practices in poor soils", says Marguerite adding that she wanted to determine the effects of the trees on feed and fertiliser quality while looking at the effect on maize crop, and the fertility status of the soil.



**Marguerite Mukangango, PhD**  
PhD graduate at the Swedish University of Agricultural Sciences. Currently a Senior Lecturer at the University of Rwanda

*Previous research has shown that Mimosa scabrella grown on acidic soils was preferred in Rwanda due to a high nutrient content but little research has been done to evaluate its productivity when subjected to different cutting practices in poor soils*

# Small & Medium

## SMALL AND MEDIUM ENTERPRISES

### Analysis on business performance in Rwanda

Small and Medium Enterprises (SMEs) are found in all sectors of the economy and are considered to be a driving force for the promotion of any economy. SMEs are crucial for sustained growth and employment whether in developed or developing countries. Despite the great contribution of SMEs to economic development, extant literature continues to report poor business performance as one of the major challenges faced by these enterprises. It is reported that worldwide more than 40 per cent of all established businesses close in the first two years and over 70 per cent by the fifth year of operation. In addition to the high failure rate, the owner-managers of the surviving SMEs in Rwanda continue to show limited competencies in soft skills. This prompted research by Eugenie Byukusenge to establish the relationships between knowledge management, managerial competencies, innovation and business performance of SMEs in Rwanda. This research was conducted at Makerere University as part of PhD thesis under the support of the UR-Sweden Programme.

The research focused on the business performance of SMEs in Rwanda reported to perform poorly over time despite government initiatives aiming at supporting them. Those initiatives include facilitating registration and taxation procedures for new businesses, providing entrepreneurial and technical skills, advice and technical support to owner-managers of SMEs, among others while networking and financing mechanisms are encouraged. Existing studies have only examined the performance of these SMEs to a limited extent. Various studies and theories have ignored the extent to which knowledge management, managerial competencies and innovation affect the business performance of SMEs. The research, therefore, examined indicators of the business performance of SMEs and established the extent to which knowledge management, managerial competencies and innovation influence the business performance of SMEs.

In the course of the research, it was found that SME owners recognized that managerial competencies bring a valuable contribution to their business performance. They indicated that these competencies like planning, communication and teamwork allow them to make savings and efficiently use limited resources like finance, time,



#### **Eugenie Byukusenge, PhD**

PhD graduate at Makerere University.

Currently a Senior Lecturer at the University of Rwanda

technology and human resources to enable a company to have more good quality products to increase the demand. Through planning, all employees are informed about the planned activities and the implementation becomes easier to boost business performance.

Contacted respondents asserted that to let the business achieve the desired sales targets, workers need to have the required skills such as analytical, organisational and problem-solving skills. Furthermore, when there is effective communication among people in the company, it makes them focused towards improving certain goals. Finally, team spirit helps to respond on time to customers' new demands and complaints, which increases sales and company competitiveness. A typical case was that of an SME owner who used participatory planning which involved various stakeholders. He noted that after 2 years, the company sales increased by 50% because they worked as a team.

The research urged policymakers and advocates of SMEs to develop sound policies geared towards enhancing the awareness of business owners about knowledge management, organise training programmes to develop further managerial competencies of business owners and promote creative ideas in the SME sector. Furthermore, business owners of SMEs should pay keen interest in managing effectively and efficiently their available knowledge resources by transforming them into new products, new processes and new markets to boost their business performance. They should also involve themselves in continuous capacity-building programmes to enhance their managerial competencies for better management of their businesses.

# Key determinants AFRICAN BANKS PERFORMANCE AND STABILITY

Banks perform vital functions in the economic systems of countries through their intermediation activities which in turn contribute to countries' growth and development. Since 1980, Africa has endeavoured to create strong, efficient, and sound banking sectors that could help to improve their economic growth via financial intermediation and growth of savings based on the implementation of recommendations of the popular Bretton Woods. Despite fundamental reforms registered especially in improving bank scale, countries have not adequately addressed problems of financial underdevelopment and stability. Samuel Mutarindwa's PhD thesis investigates the effects of countries' legal traditions, institutions, central banks' regulations and ownership on bank performance and stability using samples of banks operating in African countries.

The research is a compilation of four papers in which two papers focus on determinants of bank stability, while the other two focus on the determinants of bank performance. Mutarindwa referred to Bretton Wood's recommendations whereby many developing countries, including those of Africa, implemented structural and financial reforms including liberalisation of interest rates and privatisation of former inefficient state-owned banks. According to him, evidence shows that the implementation of these reforms has been followed by systematic instabilities, bank failures and a low degree of financial deepening.

In this thesis, Mutarindwa challenged the existing evidence on the roles of banks' financial requirements for bank stability and lending. Previous studies using bank samples from US and Europe have shown that deficiencies in bank regulatory capital and liquidity led to bank instabilities and insolvencies during the global financial crisis. The research, therefore, revealed that the financial requirements neither improve stability nor lending for African banks.

The research elucidates circumstances through which supervisory guidance of specific central banks affects bank governance, and consequently bank stability. It also provides channels through which bank-internal governance and stability improve after the publication of supervisory guidance on corporate governance by central banks. Indeed, results show that if a central bank has published supervisory guidance, local banks show better internal governance and higher stability conditional on the country's legal traditions, political stability, contract enforcement and strength of investor protection.



**Samuel Mutarindwa, PhD**  
PhD graduate at the Jönköping University. Currently a Senior Lecturer at the University of Rwanda

Besides, the thesis goes beyond ways that countries' domestic regulations and supervisory strengths influence bank stability. From there, it informed how supervisory guidance on corporate governance has strong effects on banking stability in African countries.

## **The biggest contribution was the method**

Mutarindwa used a novel approach that had not been tried in the banking industry to explain the relationship between banking ownership and efficiency. The model is called True Fixed Effects Stochastic Frontier Analysis. It was only applied in utilities and globally his study was the first to be applied in the banking industry. The research is therefore expected to add to theory but also banking practice as a tool to measure banking performance/efficiency.

The research was conducted as part of the fulfilment of PhD requirements at Jönköping International Business School. It was supported by Sida under the existing UR-Sweden Programme partnership.

*The research provides channels through which bank-internal governance and stability improve after the publication of supervisory guidance on corporate governance by central banks*



# GREAT LAKES REGION CONFLICT DYNAMICS

## New research brings deeper understanding

The belonging of Kinyarwanda-speaking Congolese generally referred to as Rwandophone as citizens of the Democratic Republic of Congo-DRC has been an ongoing question. It became more acute with the re-emergence of the autochthony discourse and the participation of Rwandophone Congolese armed groups in the DRC conflicts during the 1990s and thereafter. Thus, throughout her doctoral thesis entitled *Being in Between? Exploring Identity Construction Among Rwandophone Congolese*, Dr Furaha Umutoni Alida's interest has been to understand how civilian Rwandophone Congolese construct their identity amid competing identity claims in eastern DRC. This was doctoral research conducted at the University of Gothenburg under the existing bilateral research partnership between Rwanda and Sweden.

In her research, Dr Furaha examined how Rwandophone Congolese articulated their identity in four contexts by asking four research questions neglected by politicians and armed groups. (1) How do Rwandophones perceive and identify themselves with the armed group that claims to protect their interests? (2) How do Rwandophone Congolese legitimise their belonging to the DRC, and how do they position themselves with regard to the autochthony discourse? (3) How do Rwandophone Congolese see themselves and negotiate their identifications (if any) concerning Rwanda, and how do they experience and think about Rwanda interventions in the DRC conflicts? And (4) How do Rwandophones' experiences of inclusion-exclusion and discrimination determine processes of identity construction in North Kivu? She addressed the four questions by conducting and analysing 106 in-depth interviews between 2011 and 2014 with Rwandophone Congolese living in Kigeme and Gihembe refugee camps in Rwanda and outside of refugee camps in Rwanda and in the DRC.

She found out that the Rwandophone construction of identity is multiple and shifting, and can hardly be dissociated from the conflicts that the DRC has experienced in the past two decades. The relationship with the M23 armed group that claimed to fight and represent Rwandophone interests has been complex, says Dr Alida. She also uncovered that Congolese narratives were filled with confusion and regrets about the conflicts since many ex-CNDP (Congrès National pour la défense du Peuple) troops have chosen to remain within the Forces Armées de la République Démocratique of Congo and that some had family members fighting on M23's side. Hence, Furaha's findings showed that there is a need to draw a line, on the one hand, between political and economic demands while addressing armed group issues and, on the other hand, taking into consideration accounts from the lived experience of people in the DRC and in the refugee camps in Rwanda.

**Furaha Umutoni, PhD**  
PhD graduate at the University of Gothenburg .  
Currently a Senior Lecturer at the University of Rwanda



Relating identification with the DRC, she found that Rwandophone simultaneously identified themselves with the DRC by both embracing and rejecting autochthony discourses portraying them as non-Congolese. Findings related to the discourse of autochthony denoted that belonging has been connected to multiple aspects of attachment such as land, blood linkage to traditional authority, Jus Soli, possession of electoral card (there is no identity card in the DRC), etc.

Dr Furaha's research also found out that a possible relationship with Rwanda could not be rejected given that they share commonalities with Rwanda such as language and culture which made the Rwandophone experience a situation of being "in-between". Additionally, findings suggested that this dilemma was linked to Rwandophone Congolese's simultaneous expectation of protection and perception of abandonment by Rwanda during conflicts and their lived experiences have demonstrated that the results of Rwandan interventions in the DRC have had to some extent a mixed impact. Those Rwandophone expressed a kind of impasse by accepting that their identities are, to some extent, confusing – neither different nor similar to Rwanda, Dr Furaha says.

Finally, the findings of Dr Furaha Alida's research revealed that the everyday experiences of exclusion and discrimination have added new features such as public transportation and official ceremonies in places where exclusion and discrimination happened and has also demonstrated the role played by local authorities in the exclusion and discrimination against the Rwandophone. Rwandophone repeatedly evoked how their identities and citizenship were unstable and depended on context. Thus, meanings attributed to 'Rwandophone Congolese' are re-fashioned in a way that has allowed a complex and ambivalent construction of Rwandophone identity and living in the refugee camps has illustrated how the refugee setting made Rwandophone Congolese more conscious about their identity.

Overall, the research shows support for efforts of non-military solutions to the conflict and findings can be a basis for developing a policy that takes into consideration perspectives from the minority group whose voice has been absent in various discourses.



# WOMEN'S ECONOMIC EMPOWERMENT

## Seizing microfinance opportunities through access to small loans



**Liberata Mukamana, PhD**  
PhD graduate at Makerere University;  
currently Senior Lecturer at the University  
of Rwanda

**According to the National Institute of Statistics of Rwanda, women constitute the majority of the poor in Rwandan society as shown by different surveys on households' living conditions. Women have been excluded from the financial system, which prompted the Government of Rwanda to promote the initiatives of Microfinance Institutions (MFIs) that design appropriate financial products responding to the specific needs of women. In her research, Liberata Mukamana a PhD graduate at Makerere University seeks to analyse the extent to which microfinance loan services contribute to the economic empowerment of low-income women and men in Rwanda.**

Access to microfinance loan services has been popularised as a powerful weapon against women's low economic capacity and their historical marginalisation in decision-making. It is suggested that the economic empowerment of women is subject to the availability of resources, the skills to exploit those resources, and the ability to control the resultant benefits and produce positive changes in their lives.

This research takes a closer look at the situation of women during Rwanda's pre-colonial, colonial and post-independence periods. By then, the society was governed by patriarchal rules that promote male domination in all aspects of decision-making and ownership of property. Women were assumed to obey their husbands and depend on them for their subsistence.

Much of the efforts to promote the empowerment of women stem from a post-genocide political commitment of the country's leaders who placed gender equality at the centre of all development strategies, policies and programmes. Gendered Microfinance Institutions that consider the specific needs of poor women and men in their requirements for loan provision were put in place.

This study highlights, among others, the level of women's and men's involvement in the loan investment activity for ensuring their increased economic capacity, decision-making power, self-confidence and self-esteem both within and outside the family. It also gives detailed information about control over loans provided to women and men for undertaking income-generating activities. This involvement in more profitable income-generating activities not only enabled the borrowers to get higher incomes but also helped women to shift from the status of economic dependents to becoming independent.

Amid loan acquisition, the research found out that women are much more concerned about the welfare of their families than men. Their asset acquisition was dominated by minor assets necessary for household activities. On the other hand, men were more likely to spend their income on productive assets for strengthening their gender role as breadwinners. Men's asset acquisition was also influenced by cultural norms that assign to them the task of providing decent shelter to their families. This explains why men's asset acquisition was dominated by building assets or transportation assets whenever their income increased.

According to the research, women whose views were previously not considered in household decision-making were now consulted by their husbands before taking any decisions. Husbands now need the economic support of their wives for the implementation of their plans. Besides, women were now able to procure some of their daily needs without begging their husbands.

However, it was noted that women experienced increased workload by combining economic activities with reproductive roles as a result of social and cultural norms that maintain inequality in the gender division of household chores; and evidence of gender-based violence persisted for some female borrowers who are not major decision makers in the utilisation of their loan.

On top of relaxing the conditions of loan provision, the research recommended MFIs provide non-financial services to promote better utilisation of their loans. These include training for capacity-building for low-skilled women to manage and expand their small-scale enterprises as well as comply with the loan repayment plans. The research also called for finding interventions that can transform cultural norms that prohibit men's participation in reproductive roles.

**Husbands now need economic support of their wives for the implementation of their plans**



# CERVICAL CANCER

## Effects of Chronic Human Papillomavirus and other Sexually Transmitted Infections

According to recent reports, each year more than half a million women aged 15-44 years are diagnosed with cervical cancer which constitutes more than a quarter of a million deaths worldwide. Cervical cancer is the most common cause of cancer-related deaths in sub-Saharan Africa. In Rwanda, the disease is responsible for more than 1000 new cases diagnosed each year and it is classified as the leading cause of death among women. In her thesis, Marie Françoise Mukanyangezi a PhD graduate at the University of Gothenburg carried out a study to assess the prevalence and the natural history of Human Papillomavirus (HPV) infections in Rwanda and other Sexually Transmitted Infections which are the main risk factors for cervical cancer.

To find out the prevalence of cervical cancer in Rwanda and its correlation with HPV and other sexually transmitted infections, Mukanyangezi conducted numerous STI screenings coupled with a series of interviews with women aged 17 years and older. The women were visiting the gynaecology and obstetrics department at two hospitals; one in Kigali and another in the southern part of Rwanda. HIV-infected women followed at HIV clinics at internal medicine at the University Teaching Hospital of Kigali were also invited to take part in the study.

Part of the research findings includes the fact that women's sexual behaviours such as early age at first intercourse, a high number of lifetime sexual partners and a history of gonorrhoea infection constituted risk factors for high risk of Human Papillomavirus infections acquisition. The research also indicated that the overall prevalence of Human Papillomavirus infections and the prevalence of high-risk-HPV infections are quite high even if they fit into the range of those previously reported in Rwanda. The data, therefore, confirm that Rwanda is among East African countries with a high prevalence of HPV infection; bearing in mind that HPV is the leading cause of cancer.

In addition, a high level of HPV incidence especially among previously negative tested women is a bad indication that, if nothing is done, the predicted increase in HPV infections among Sub-Saharan African countries should become true.



**Marie Françoise Mukanyangezi, PhD**  
PhD graduate at the University of Gothenburg .  
Currently a Senior Lecturer at the University of Rwanda

Among the research, recommendations include that girls should be vaccinated before the onset of their sexual activities. Besides, cancer awareness is important to improve risk reduction behaviours, promote timely cancer screening for early detection, and ultimately reduce the cancer burden. The research also calls for screening to detect the disease in its earliest stages of development, before symptoms appear, and to stop its progression with lighter treatment methods leading to a greater chance of recovery.

The research further recommends that all sexually active HIV-infected women should be screened for cervical cancer immediately after their HIV status is known. This is due to the aggressive nature of the cervical neoplastic process in HIV-positive women.

*The research calls for screening to detect the disease in its earliest stages of development, before symptoms appear, and to stop its progression with lighter treatment methods leading to a greater chance of recovery.*

# HEPATITIS VIRUSES IN RWANDA

## Their implication on liver disease

According to the World Health Organization, hepatitis is the seventh leading cause of death globally. Hepatitis B and C viruses mainly cause chronic hepatitis, liver damage and fibrosis, and long-term risk of cirrhosis and liver cancer. Of them, hepatitis B and C viruses (HBV and HCV) are the leading causes of liver cirrhosis (LC) and they are prevalent in more than 60% of patients with liver diseases worldwide. In Rwanda, liver diseases are common and cause 1.5% of annual deaths. Theogene Twagirimugabe, a PhD graduate at Gothenburg University carried out research to investigate the presence of five types of hepatitis viruses (HBV, HCV, HDV, HEV and HAV) in blood donors and liver disease patients and their matched controls. The research aimed to evaluate the seroprevalence of hepatitis viruses among volunteer blood donors and patients and the risk factors to get hepatitis infections in Rwanda.

This was doctoral research conducted among healthcare professionals, support staff in healthcare facilities, and drug abusers under the existing bilateral research partnership between Rwanda and Sweden. The research found that both hepatitis B and hepatitis C viruses are endemic in Rwanda and caused 74% of liver diseases, whereas HCV was more common in patients with liver cirrhosis and liver cancer than HBV. In addition, HBV in Rwanda showed predominance in young males, a potential sexual and intra-familial transmission. The latter is shared with HCV but in contrast, HCV showed an age-dependent increasing prevalence and is more likely to be diagnosed in females older than 49 years probably exposed many years back to unsafe healthcare practices at home or health facilities during pregnancies and/or deliveries. Both HBV and HCV were the foremost primary drivers of liver diseases with HCV particularly more important in liver cirrhosis and other severe liver complications.

Vaccination is highly recommended to prevent infections, especially for people at high risk such as newborns and individuals living with infected persons.



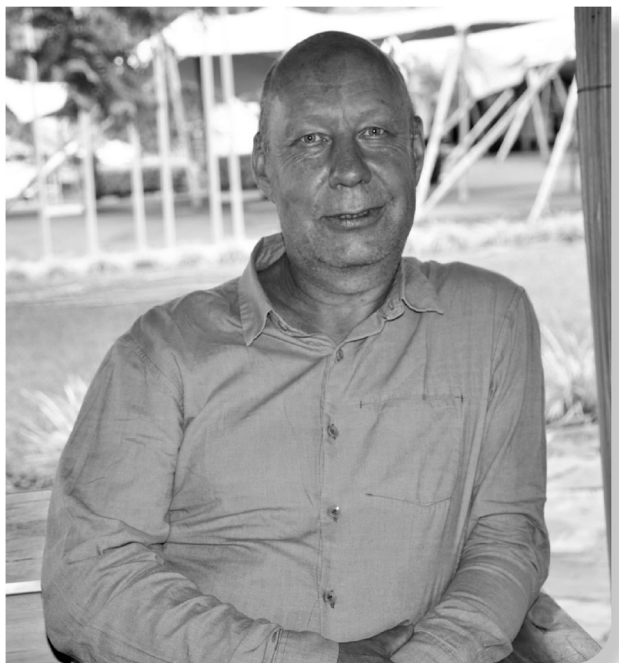
**Vaccination is highly recommended to prevent the infections especially for people at high risks such as newborns, healthcare professionals, support staff in health care facilities, drug abusers and individuals living with infected persons**



**Theogene Twagirimugabe, PhD**  
at Gothenburg University .  
Currently Senior Lecturer at the  
University of Rwanda







### Tomas Kjellqvist

Researcher at Södertörn University .  
Team Leader of Innovation Subprogram

**The quest to build an innovation culture at the University of Rwanda has been one of the Programme's priorities in recent times. The turning point was the establishment of an innovation sub-programme which operates through the collaboration between the University of Rwanda and Södertörn University. The sub-programme has paved the way for the creation of an Innovation and Entrepreneurship Centre which has the mandate to provide capacity building to people with innovative solutions to problems facing communities. Tomas Kjellqvist, a researcher at Södertörn University explains the partnership journey together with colleagues at the University of Rwanda, which is on the verge of cementing a vibrant innovation hub.**

The Innovation Sub-programme was mainly initiated to leverage the great potential at the University and nurture and encourage an entrepreneurial mindset to allow researchers to do more innovative research. The starting point was the identification and training of innovation coordinators from each college of the University. The coordinators were expected to guide their colleagues at the college level to forge collaboration with various partners. The main purpose was to design projects that would be possible to commercialize in the long run.

Later on, a good idea came up to establish the Centre for Innovation and Entrepreneurship. According to Tomas, the creation of the centre was such a major milestone which contributed to having an institutional

# TOWARDS BUILDING INNOVATION CULTURE AT UR

## A journey by Kjellqvist

The SDGs are the measure of success of innovation; if we bring up from that level a little bit, UR will be a reliable partner to combat poverty through the national innovations systems

framework to guide innovation-related activities at the University. Besides, the Centre developed innovation policies and set down several procedures.

So far, 12 best innovation projects have been selected among 29 that competed in the call for proposals launched. The UR research committee is the one that assesses and selects the best projects to be funded by the UR Centre for Innovation and Entrepreneurship.

For sustainability and high impact, Tomas Kjellqvist calls on UR through the Center of Innovation and Entrepreneurship to secure funding for continued development, as well as to ensure that there are the right partners outside the University.

He reckons that innovations are now included in sustainable development goals as one of the major tools of being quite forward-looking.

"The SDGs are the measure of success of innovation; if we bring up from that level a little bit, the University of Rwanda will be a reliable partner to combat poverty through the national innovations systems" said Kjellqvist.





# INSTRUCTIONAL TECHNOLOGY SUBPROGRAM

Dividends 9 years since its establishment

## Thashmee Karunaratne

Associate Professor at the Department of Computer and Systems Sciences at the University of Stockholm-  
Team Leader of Instructional Technology Subprogramme

To support UR researchers and academics with the use of different E-learning systems, an Instructional Technology Sub-programme was created. Thashmee Karunaratne, a member of staff at the University of Stockholm, alongside Dr Mathias Nduwingoma of the University of Rwanda were the pioneers of the Instructional Technology sub-programme. Impact Mag (IM) talked to Thashmee to hear more about her experience and key milestones from the sub-programme nine years since it was created.

**IM: Instructional technology was a new concept, what was the feeling when it was introduced at UR?**

Thashmee: When we started the journey, we had in our mind to have one of the most efficient e-learning tools in Rwanda. In the beginning, people could not figure out the motives behind the new tools being developed. According to her, the team was resolved to support the university with appropriate ICT tools to improve the quality of education in the University. Our main objective was to identify which tools and technologies are more relevant and useful for online education and the next step was to select the right people for training both technicians and faculty staff.

**IM: What are the main achievements?**

Thashmee: One of our main achievements is the development of the Moodle platform which was initiated back in 2015. The platform has been instrumental, especially during COVID 19 where online learning, teaching and assessment thrived despite the pandemic. Currently, the platform boasts hosting 95% of all the University of Rwanda teaching modules with an average of 83K visits per day. Along the way, a total of

21 IT technicians were trained to manage and maintain the e-learning platform, whereas 1346 lecturers were equally supported to develop courses and modules and upload them online. In addition, a few members of the UR community, dubbed “champions”, were trained to provide technical support to staff to ensure that uploaded materials are more interactive with students. The sub-programme also supported two UR staff to obtain their PhD whose research explored tools and the use of ICT for enhancing education.

**IM: In which sense do you think your efforts were rewarded?**

Thashmee: We started with small steps; we took one thing at a time and we started with an e-learning platform. We thought about a suitable way in which we could develop this. Then we had a lot of things that we identified to be prioritized, and we just went by each of those priorities. Now you can see the results. For example, 5 years ago, there was no awareness about what is plagiarism but now everybody is talking about it. Now, we see that people are using tools, identifying and recognising them as new things that are useful and essential for enhancing quality. Seeing as that is the satisfaction.

**IM: Any personal gains from your work in Rwanda?**

Thashmee: The main thing is satisfaction. I really like to work with Rwandans, they are a very nice group to work with and they are very supportive, helpful and friendly, and every time that I am in Rwanda I enjoy the stay. That is my biggest gain actually; doing something for your satisfaction.

# TRANSFORMING LIBRARY SYSTEMS AT THE UNIVERSITY OF RWANDA

The library Subprogramme is one of the research supporting subprogrammes of the UR-Sweden Programme. The Sub-programme has contributed to the creation of a research environment through the acquisition of relevant ICT equipment and software. The sub-programme has also been instrumental in helping the UR libraries to enhance their capacity for teaching, learning and research among others. Veronica Trépagny, from the Swedish School of Library and Information Science, University of Borås, is the team leader of the Library Sub-programme on the Swedish side. She explains significant strides made in revamping UR libraries towards contributing to global knowledge.

According to Trépagny, their main objective was to have a harmonized university library system so that everybody can access the same materials wherever they are. For this to happen, the Library Sub-programme initiated a capacity-building and competence scheme for librarians through a series of short courses. The next move was the subscription to e-Resources and reputable journals which are not only available for the UR but for all public institutions in Rwanda.

“It feels so good to contribute to knowledge development at the University of Rwanda but it makes more impact when others can use it as well”, Trépagny noted.

She added that the Sub-programme looks on to becoming a modern research library at the forefront to promote the reading culture as a precursor for the research culture and research growth. The sub-programme also built up the library web page; a user-friendly interface where users remotely interact with the library off campus. In fact, almost all the services offered physically in the library are also available on the webpage, she emphasized. For the current phase, Trépagny pointed out that the focus of their sub-programme is to build a relationship with academics and students at all levels and ensure that they make use of available resources.

“We are looking at a library that gives support in academic writing, anti-plagiarism and other needed academic research tools such as statistical data, etc.,” she said.

Trépagny also added that they are on the verge of communicating and sharing all the research that has been done at the University of Rwanda ranging from bachelor’s dissertations to PhD theses. According to her, the move will also see all research and published papers digitized and made available through the University repository.



## Veronica Trépagny

Project Coordinator in the Faculty of Librarianship, Information, Education and IT at the University of Borås -Team Leader of Library Subprogramme

**It feels so good to contribute to knowledge development at the University of Rwanda but makes more impact when others can use it as well**



# MATHEMATICS & STATISTICS

## Its promotion and demystification in schools



*Mathematics is a very special subject, you have to discover those talented early enough and give them chance to develop*

### **Paul Vaderlind**

Senior Lecturer at Linköping University  
Team Leader of Applied Maths and Statistics  
Subprogramme

The shortage of highly qualified PhD and Masters holders within Rwanda has prompted the UR-Sweden Programme to establish an Applied Maths and Statistics Sub-programme. Currently, the sub-programme has supported, among others, several master's students, while seven UR staff were funded to obtain PhD degrees. Dr Paul Vaderlind, the Sub-programme team leader on the Swedish side, shares his experience in working with the sub-programme together with his colleagues in Rwanda. He is from Linköping University in Sweden.

Talking with him, Vaderlind is satisfied that the sub-programme managed to develop and run a maiden master's programme in mathematics and statistics at the University of Rwanda. He also added that the sub-programme has made a big step by launching in-house PhD education knowing that the majority of PhD holders in the Mathematics department were trained in Sweden. According to him, the sub-programme envisions establishing a training and research environment in Rwanda which would be comparable to western education.

Among the sub-programme challenges include the issue of attracting more female students. The sub-programme also faces the challenge related to keeping enrolled students in a research environment as much as possible so that while studying they don't have to look for side jobs to support themselves.

"This is a question of stipends and not all the students can get enough stipends but we try to cover as much as we can", he said.

He called on the University of Rwanda through the Department of Mathematics to establish contacts with secondary schools since they constitute a place where talented people can be discovered at an early stage.

To bridge the gap, the sub-programme has intensified the Mathematics campaign by organizing annual Mathematics competitions for high school students on the occasion of an international day of Mathematics known as Pi day. Participants are taken through stimulating lectures and problems solving sessions showing them that mathematics is fundamental for cutting-edge technologies. This is reckoned to be the best way to attract more young female students to study mathematics who, at some point, will be able to go for postgraduate studies.

"Mathematics is a very special subject, you have to discover those talented early enough and give them the chance to develop", Vaderlind said.

So far, Vaderlind is pleased with the sub-programme results. Despite that, there might be differences in terms of results from country to country; he admitted that the achievement in Rwanda is more tangible than in other countries and this makes his work very special.

The Senior Research Advisor at the Swedish International Development Cooperation Agency (Sida) commended the research culture being developed at the University of Rwanda. Dr Therese Soop expressed her satisfaction during a 3-day visit to UR in which she discussed with UR officials and researchers the status and impact of research since the establishment of the UR-Sweden Program. Her visit is in line with the existing research collaboration between the Government of Rwanda and Sweden under Sida support, a partnership spanning 20 years now.

Speaking on the occasion, Therese hailed the research and innovation projects that are being conducted at the University of Rwanda. She further noted that both research and innovation should lead to social impact. Therese added that the academic environment, the innovation processes, as well as the aspect of local context are among the key components for research culture to flourish.

Among the research presenters on the occasion included Dr Parfait Yongabo who, in his research, explored among others the innovation ecosystem in Rwanda and highlighted the efforts of Rwanda in developing innovation systems. For the innovation to take place Yongabo urges among others proper interaction among stakeholders (Universities, industries and Government agencies).

Yongabo is a faculty member of the College of Agriculture, Animal Science and Veterinary Medicine at the University of Rwanda; a PhD graduate in Research Policy at Lund University in Sweden. He is among the 83 UR-Sweden Program PhD graduates under the bilateral research partnership between Rwanda and Sweden.

It was noted that UR has embarked on the journey to promote research uptake and ensure that conducted research can inform practices and make a direct impact on community welfare. The meeting underlined the importance of innovation becoming embedded in the University of Rwanda curriculum, which will ultimately sustain the culture of innovation at all levels.

## RESEARCH AND INNOVATION SHOULD LEAD TO SOCIAL IMPACT

### Therese Soop



#### Therese Soop

Senior Research Advisor at the Swedish International Development Cooperation Agency (Sida)



# TRIBUTE TO PROF GAHUTU

## The fallen Team leader of Infectious Diseases

The UR-Sweden Programme and UR community at large were saddened by the loss of Prof. Jean Bosco Gahutu who passed away on 7th September 2020. The devastating news came when he was the team leader of Infectious Disease, a sub-programme that seeks, among others, to perform epidemiological studies of challenging infectious diseases in Rwanda. He also led the sub-programme of Medicine and Health in the previous phases since 2007 through which 12 UR staff have graduated with PhD so far.

The untimely demise was a shock to everyone, especially his academic research colleagues and medical fraternity. In the tributes that poured in, he was described as a humble, pleasant and appealing personality and very dedicated to his profession. The University of Rwanda expressed its regret for the passing of Prof Gahutu who played a critical role in promoting research.

"We will always be grateful for his compassion, unwavering commitment and his pivotal role in promoting research", read a UR statement

Prof. Gahutu also served as the Director of Research and Innovation and Professor of physiology at UR College of Medicine and Health Sciences. He conducted and achieved much research in the field of Medicine and Health Sciences. His passing was therefore a huge loss not only to the University but also to the country

Prof. Gahutu will be remembered for many research works he championed, which have gone on to have a lasting impact. For instance, his research work on the bio-fortification of beans through cross-breeding is quite memorable. The research was aimed at assisting people with iron deficiency to have more of such nutrients through beans.

His legacy will live on.



**Late Jean Bosco Gahutu**  
Professor at University of Rwanda  
Team Leader of team leader of Infectious  
Disease  
Subprogramme and Medicine and health  
sciences

# INSIDE ANNUAL PLANNING MEETING (2022-2023)

The UR-Sweden Programme has been hailed by the Ministry of Education for contributing to Rwanda's socio-economic transformation over the past 20 years and the next five years through promoting research and PhD studies. The Program contributes to the development of Rwanda and poverty eradication through research support to the University of Rwanda. It has been for a couple of years the largest and most comprehensive externally funded Institutional Program at the University of Rwanda.



*"The Rwanda-Sweden research cooperation aims to strengthen the research capacity not only by increasing the number of PhD graduates, but also to ensure that their research findings are of significant impact to the socioeconomic transformation process of the country."*

**Hon. Dr Valentine Uwamariya**  
Minister of Education



*"Our partnership seeks to ensure that the research capacity built over time is used in Rwanda's development to enable policymakers and entrepreneurs access vital knowledge needed to make informed decisions"*

**H.E Johanna Teague**  
Ambassador of Sweden to Rwanda







The UR-Sweden Programme for research, Higher Education and Institutional Advancement aims to support the development of research at the University of Rwanda and to increase the use of research and competence produced within the Programme, in political decision policy making and in the Rwandan society at large



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