



# African Risk Methods School (ARMS)

**Focus on Geophysical & Hydrological Urban Risks, Hazards & Vulnerabilities**  
**28 October – 1 November 2019**

## Introduction

As East Africa becomes increasingly urban, its risk profile is in rapid transition. This shift is interlinked with changing environmental conditions, including increasing climate variability and change. These factors, combined with fast-growing regional and continental mobility, have created new risk configurations that require inventive development and risk management strategies. They have also highlighted the urgency for grounded, integrated resilience research in risk-prone areas.

Recognising this imperative, the Periperi U partnership is convening an intensive, 5 day school styled event in Addis Ababa Ethiopia. During this period, the School will offer courses in the following themes;

- **Urban Geophysical Risks**
- **Urban Hydrological Risks**
- **Integrated Disaster Risk Reduction Science and Action**

This collaboration responds to the call for Africa's scientists and researchers to work more closely with humanitarian action, development and disaster risk reduction practitioners, underlined by the 2015 global landmark agreements, including the Sendai Framework for Disaster Risk Reduction, the Agenda 2030 for Sustainable Development and the Paris Agreement. In response, the teaching team brings a wide range of academic and applied expertise in contemporary risk and resilience research in Africa.

## Course teaching and audience

The African Risk Methods School (ARMS) modules draws on six academic teaching staff from African universities where successful disaster risk and resilience academic programmes are well-established and recognised. These include Ardhi University (Tanzania), Bahir Dar University (Ethiopia), Stellenbosch University (South Africa), the University of Buea (Cameroon) and the University of Sciences and Technology Houari Boumediene (Algeria).

The list of lecturers include the following;

- **Mr Tarekegn Ayalew** - Institute of Disaster Risk Management and Food Security Studies, Bahir Dar University, Bahir Dar, Ethiopia ([tarekegnayalew@gmail.com](mailto:tarekegnayalew@gmail.com))
- **Mr Arthur Chapman** – Hydrological Consultant, Stellenbosch University, South Africa ([arthur.chapman@gmail.com](mailto:arthur.chapman@gmail.com))
- **Mr Dionus Simon Rugai** - Disaster Management Training Centre, Dar Es Salaam, Tanzania ([dionisr@gmail.com](mailto:dionisr@gmail.com))
- **Dr Djillali Benouar** - Built Environment Research Laboratory, University of Sciences and Technology Houari Boumediene, Algiers, Algeria ([dbenouar@gmail.com](mailto:dbenouar@gmail.com))
- **Dr Samuel Ayonghe** - Centre for Hazard Monitoring and Disaster Management, University of Buea, Buea, Cameroon ([sam.ayonghe@gmail.com](mailto:sam.ayonghe@gmail.com))



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The courses are designed for emerging researchers with an interest in the socially and intellectually compelling fields of disasters, risk and resilience. They have been developed for PhD (or prospective PhD) students from Africa. The courses have also been crafted for senior risk managers outside of academia who wish to acquire new perspectives in risk research and theory – to keep abreast of developments in the field.

From an interdisciplinary perspective, the courses are conceptualised to integrate the geophysical and social sciences. They intend to provide a two-way immersive bridge so that attendees with skill-sets in the physical sciences can strengthen their understanding of the integrated socio-economic and political consequences of such geophysical hazards on urban centres and communities. Similarly, students and researchers in the social science with disaster, resilience or risk-related topics can fast-track their understanding of geophysical processes and risks.

### Registration and Communications

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Information on application processes, logistics, accommodation, visa or other information concerning ARMS 2, will be made available on the Periperi u website [www.riskreductionafrica.org](http://www.riskreductionafrica.org) for participants to view.

Interested persons will be able to apply for ARMS 2 through an online registration system (<http://www.riskreductionafrica.org/events/african-risk-methods-school.html>). Participants will be expected to complete the online registration, answering all questions required, as well as forward the following three documents to the email address ([albertofrancioli@sun.ac.za](mailto:albertofrancioli@sun.ac.za))

- A recent copy of applicant's **ACADEMIC TRANSCRIPT**
- A recent copy of applicant's **CURRICULUM VITAE (CV)**
- A valid copy of applicant's **PASSPORT**

Completing the application process will not mean automatic or immediate acceptance to ARMS 2. All applications are to be reviewed by the ARMS 2 organisers, particular by the staff of the modules the participants are directly applying for. Participants will be notified within a few days to inform them whether their application was accepted or not.

### Services rendered by organisers for ARMS 2 participants

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Several services will be rendered unto participants of the ARMS to assist them in joining ARMS 2;

- **Visa assistance:** Upon acceptance into the Risk Methods School, participants will be provided with documents such as letters of acceptance, letters of invitation, and proof of accommodation, to assist them in their visa applications.
- **Per diems:** Participants will receive a daily stipend/per diem between 28 October – 2 November 2019 which will be distributed by the Organisers upon arrival.
- **Transportation:** Participants international flights will be booked and covered by ARMS 2 organisers for those travelling from outside Ethiopia. Only domestic flights from within Ethiopia will be covered by the organisers. This will also include local taxi transfers to and from the airport. All flights will be economy class.
- **Accommodation and Venue:** Organisers along with their partners at Bahir Dar University have negotiated to hold ARMS 2 at the '*Intercontinental Hotel*' in Addis Ababa (see attached documentation). The hotel will serve to accommodate the participants and staff as well as



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provide venues and technical assistance for teaching classes between 28 October – 2 November 2019. Participants and staff will only have their accommodation provided for those specified dates

- **Meals:** The following meals will be provided to and covered for participants;
  - Breakfast by the accommodation venue
  - Mid-morning/brunch snack and tea by the hotel's conferencing facilities
  - Participants will be expected to arrange their own dinner either at the hotel's restaurant

### ARMS Programme

ARMS 2 will offer one compulsory 2 day course on 'Integrated Disaster Risk Reduction Science & Action', then participants will have the option to attend one of two courses, one on 'Urban Geophysical Risks' and the other on 'Urban Hydrological Risks'

Date	27 Oct	28 Oct	29 Oct	30 Oct	31 Oct	1 Nov
Course option 1	Opening	1: Integrated Disaster Risk Reduction Science & Action	2A: Urban Geophysical Risks			
Course option 2			2B: Urban Hydrological Risks			

Course 1	Integrated Disaster Risk Reduction Science & Action	
Dates:	28 October - 29 October 2019	
Course Convenors:	<b>Mr Tarekegn Ayalew</b> - Institute of Disaster Risk Management and Food Security Studies, Bahir Dar University, Bahir Dar, Ethiopia Email: <a href="mailto:tarekegnayalew@gmail.com">tarekegnayalew@gmail.com</a> <b>Second Lecturer still to be decided upon</b>	
Course Description	Increasing awareness of risk and resilience as central themes for achieving the sustainable development goals is reflected in their emergence as important domains of contemporary research and scholarship. In response, and in the context of Africa's highly dynamic and complex risk profile, the continent's science and academic community is increasingly called on to conduct integrated risk and resilience research in risk-prone urban settings. This course is set to understand the fundamentals of disaster risks and its management over last 30 years, and the role of science and technology for the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030 in Africa.	
Time	Programme	
Day One: 28 October	Theme	Facilitator/teacher
09:00 – 10:30	Understanding fundamentals of disaster risks and its management over last 30 years. <i>(•Theories of disaster risks and its management;</i> <i>•School of thought in DRM - Disaster Education &amp; Research;</i>	Mr Tarekegn Ayalew



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	<ul style="list-style-type: none"> <li>•Concepts and definitions;</li> <li>•Global and regional disaster risk reduction frameworks and strategies)</li> </ul>	
10:30 – 11:00	Tea Break	
11:00 – 12:30	Understanding the Sendai Framework for Disaster Risk Reduction 2015-2030: focus on the four Priority areas	Mr Tarekegn Ayalew
12:30 – 13:30	Lunch	
13:30 – 15:00	Disaster Risk Reduction and Management in Africa; Disaster Risk analysis and conceptual models;	Mr Tarekegn Ayalew
15:00 – 15:30	Tea Break	
15:30 – 17:00	Integrating Disaster Risk Reduction, Climate Change and sustainable development, including Cultural Heritage	Mr Tarekegn Ayalew
<b>Day Two: 29 October</b>	<b>Theme</b>	<b>Facilitator/teacher</b>
09:00 – 10:30	Role of Science and Technology for the implementation of the Sendai Framework for Disaster Risk Reduction 2015-2030;	Mr Tarekegn Ayalew
10:30 – 11:00	Tea Break	
11:00 – 12:30	Role of science, technology and education for disaster risk management: Applying science to action to inform policy, planning and action	Mr Tarekegn Ayalew
12:30 – 13:30	Lunch	
13:30 – 15:00	Models in post-disaster loss assessment	Mr Tarekegn Ayalew
15:00 – 15:30	Tea Break	
15:30 – 17:00	Advancing skilled human capital for disaster risk reduction and resilience in Africa	Mr Tarekegn Ayalew



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<b>Optional Course 2A:</b>		<b>Urban Geophysical Risks</b>	
<b>Dates:</b>	<b>28 Oct – 31 Oct</b>		
<b>Course Convenors:</b>	<b>Dr Djillali Benouar</b> – Built Environment Research Laboratory, University of Sciences and Technology Houari Boumediene, Algiers, Algeria <b>Email:</b> <a href="mailto:dbenouar@gmail.com">dbenouar@gmail.com</a>		
	<b>Dr Samuel Ayonghe</b> – Centre for Hazard Monitoring and Disaster Management, University of Buea, Buea, Cameroon <b>Email:</b> <a href="mailto:sam.ayonghe@gmail.com">sam.ayonghe@gmail.com</a>		
<b>Course Description</b>	The rapid growth of East Africa's cities and towns has led to a growing complexity of urban risks. With urban risk a growing priority for researchers, planners and development practitioners, there is urgency to harness available geospatial analytic tools and methods to understand changing hazard, risk and vulnerability patterns. This Course will specifically examine geophysical hazards that threaten african cities , exploring the vulnerabilty of urban infrastructure, services and communities, as well as discuss and explore measure which assess risk as well as mitigatory actions to reduce risk.		
<b>Time</b>	<b>Programme</b>		
<b>Day One:</b>	<b>Theme</b>	<b>Facilitator/teacher</b>	
<b>30 October</b>			
09:00 – 10:30	Introducing Disaster Risk in an urban context	Sam Ayonghe	
10:30 – 11:00	Tea Break		
11:00 – 12:30	Expanding on concepts of hazards, vulnerability, risk, risk reduction, and resilience	Djilalli Benouar	
12:30 – 13:30	Lunch		
13:30 – 15:00	Understanding multiple geophysical hazards including; landslides, mudflows, sinkholes, earthquakes and volcanic activity.	Sam Ayonghe	
15:00 – 15:30	Tea Break		
15:30 – 17:00	Explaining core concepts related to urban geophysical risk as these apply to rapidly changing African cities and urban areas	Djillali Benouar	
<b>Day Two:</b>	<b>Theme</b>	<b>Facilitator/teacher</b>	
<b>31 October</b>			
09:00 – 10:30	Examining urban vulnerability and impacts from a socio-economic and political context	Sam Ayonghe	
10:30 – 11:00	Tea Break		
11:00 – 12:30	Examining urban vulnerability and impacts from a socio-economic and political context (continued...)	Djilalli Benouar	
12:30 – 13:30	Lunch		
13:30 – 15:00	Methods of monitoring urban geophysical risks (volcanic eruptions, seismicity, landslides, etc.)	Sam Ayonghe	
15:00 – 15:30	Tea Break		
15:30 – 17:00	Case study Cameroon: landslides and volcanic activity (continued...)	Sam Ayonghe	



<b>Day Three: 1 November</b>	<b>Theme</b>	<b>Facilitator/teacher</b>
09:00 – 10:30	Discussing Resilience and reducing geophysical risk; risk informed urban planning, earthquake engineering, building codes, structural stability	Djilalli Benouar
10:30 – 11:00	Tea Break	
11:00 – 12:30	Case Study: Seismic Risks and earthquake resilience in Algeria	Djillai Benouar
12:30 – 13:30	Lunch	
13:30 – 15:00	Case Study: Seismic Risks and earthquake resilience in Cameroon	Sam Ayonghe
15:00 – 15:30	Tea Break	
15:30 – 17:00	Information dissemination, community awareness and sensitisation to geophysical risks	Djillai Benouar and Sam Ayonghe

<b>Optional Course 2B:</b>	<b>Urban Hydrological Risks</b>	
<b>Dates:</b>	<b>31 October - 2 November 2019</b>	
<b>Lecturer:</b>	<b>Mr Arthur Chapman – Stellenbosch University, South Africa</b> Email: <a href="mailto:rarthur.chapman@gmail.com">rarthur.chapman@gmail.com</a>	
	<b>Mr Dionus Simon Rugai - Disaster Management Training Centre, Dar Es Salaam, Tanzania</b> Email: <a href="mailto:dionisr@gmail.com">dionisr@gmail.com</a>	
<b>Course Description</b>	African Cities are often faced with two extremes, too little or too much water. With increasing severe weather events driven by changing climate, rapidly growing and transforming African towns and cities are at significant risk of disruption to communities and livelihoods, incur massive damages, which threaten to undermine future development and growth. This course seeks to examine the various hydrological hazards experienced by cities in Africa, the vulnerability of urban communities, as well as discuss and explore measure assess risk as well to mitigate risk and reduce their impacts.	
<b>Day One: 30 October</b>	<b>Theme</b>	<b>Facilitator/teacher</b>
09:00 – 10:30	Introducing Disaster Risk in an urban context	Mr Chapman & Mr Rugai
10:30 – 11:00	Tea Break	
11:00 – 12:30	The urban context - what makes urban areas vulnerable to hydrological hazards	Mr Chapman & Mr Rugai
12:30 – 13:30	Lunch	
13:30 – 15:00	The urban context - what makes urban areas vulnerable to hydrological hazards (continued)	Mr Chapman & Mr Rugai
15:00 – 15:30	Tea Break	



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15:30 – 17:00	Southern and East African Case Studies of Hydrological Risk	Mr Chapman & Mr Rugai
<b>Day Two: 31 October</b>	<b>Theme</b>	<b>Facilitator/teacher</b>
09:00 – 10:30	Climate extremes contributing to Hydrological risk: Heavy precipitation	Mr Chapman & Mr Rugai
10:30 – 11:00	Tea Break	
11:00 – 12:30	Climate extremes contributing to Hydrological risk: Flash Flooding	Mr Chapman & Mr Rugai
12:30 – 13:30	Lunch	
13:30 – 15:00	Climate extremes contributing to Hydrological risk: Drought	Mr Rugai
15:00 – 15:30	Tea Break	
15:30 – 17:00	Disaster Risk Management /governance issues	Mr Rugai
<b>Day Three: 01 November</b>	<b>Theme</b>	<b>Facilitator/teacher</b>
09:00 – 10:30	Short Practical Exercise: Hydrological risk from Participant perspective	Mr Chapman & Mr Rugai
10:30 – 11:00	Tea Break	
11:00 – 12:30	Methods and tools for urban hydrological risk assessment	Mr Chapman & Mr Rugai
12:30 – 13:30	Lunch	
13:30 – 15:00	Introducing mapping tools to identifying and assessing flood risk, such as GIS and remote sensing.	Mr Chapman & Mr Rugai
15:00 – 15:30	Tea Break	
15:30 – 17:00	Community Based Flood Mitigation strategies	Mr Chapman & Mr Rugai