



Hands-on brick making workshop for students of UR, Kigali (Rwanda)



Experimental clay wall construction with students of UMU, Nkozi (Uganda)



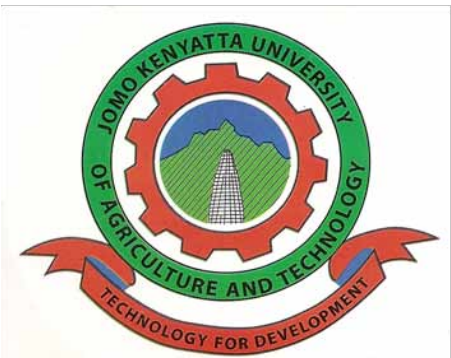
Staff, students and stakeholders from all partner countries at UR Design-Build Oben House Event in Rwinkwavu (Rwanda)

## COORDINATOR



Augsburg University of Applied Sciences (Germany)

## PARTNERS



Jomo Kenyatta University of Agriculture and Technology (Kenya)



University of Rwanda (Rwanda)  
College of Science and Technology



Uganda Martyrs University (Uganda)



Stellenbosch University (South Africa)

## ASSOCIATES



UN Habitat

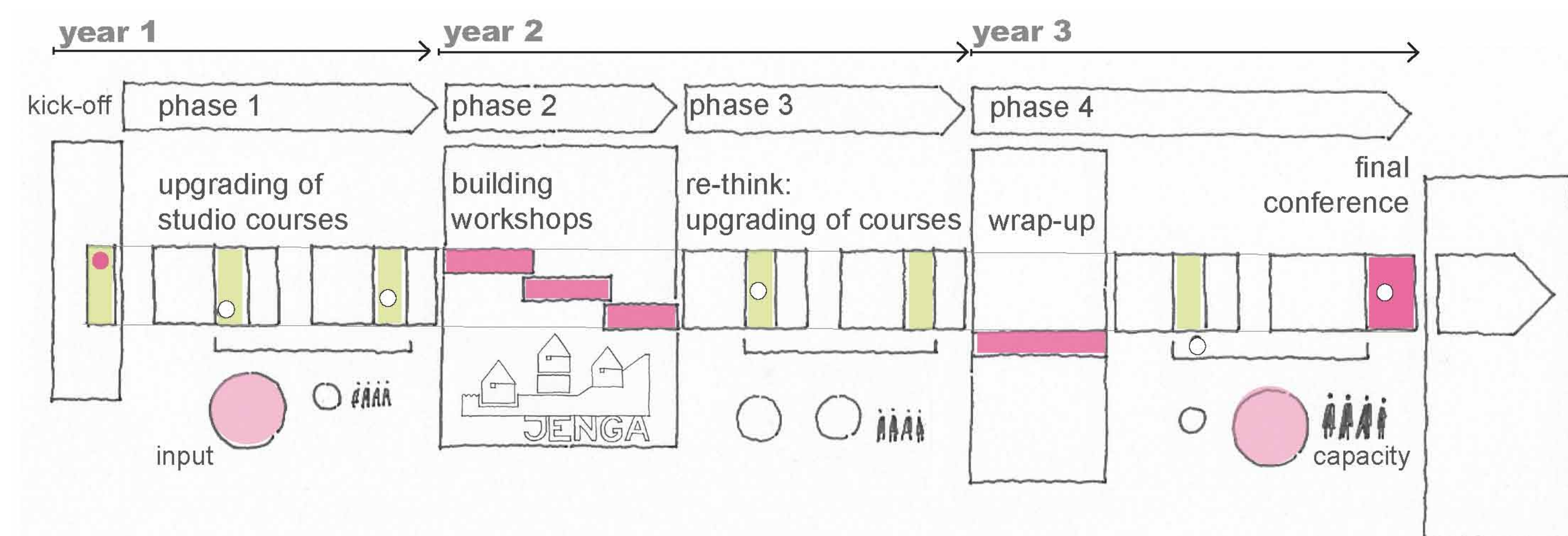


American University Cairo (Egypt)

## WHAT IS JENGA?

JENGA aims at academic capacity building and knowledge transfer for energy efficiency and low-carbon technologies in the field of sustainable housing, addressing the fact that the building sector accounts for 40% of global energy consumption and 30% of greenhouse gas emissions.

By introducing the method of problem-based learning through the implementation of design-build courses in Kenya, Uganda and Rwanda into existing curricula of architecture, links will be established between content and method of teaching and also between the participating institutions themselves. This will culminate in the creation of a regional network of excellence for thinking, teaching, researching and producing energy-efficient housing.



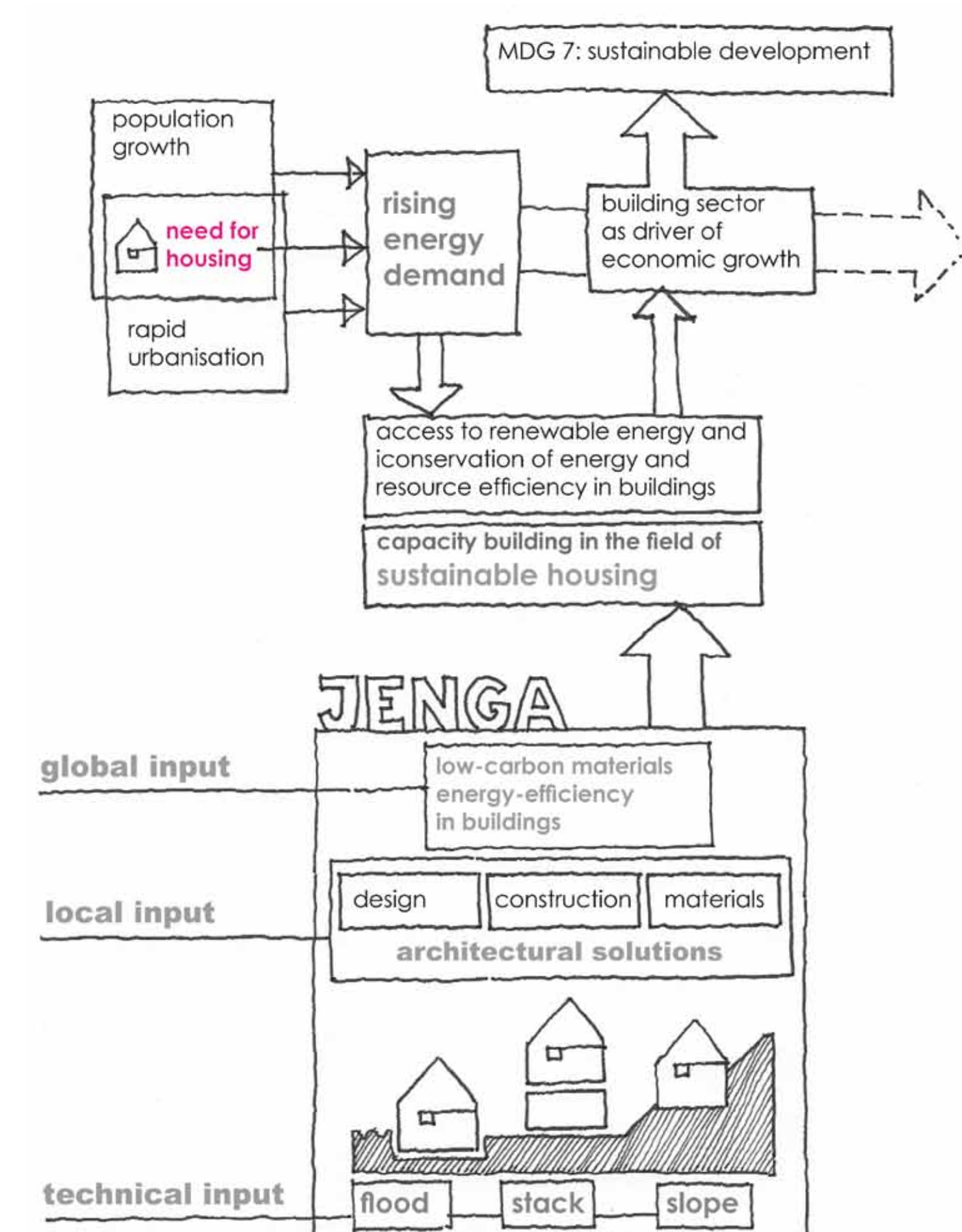
## CHALLENGE

In all African countries concerned, supply and generation capacity for electricity cannot keep pace with the growing demand for energy for households and production processes. Higher energy prices coincide with inefficiency in the use of energy, particularly in the domestic sector. This tendency has led to energy becoming the limiting factor for sustainable development and economic growth in the recent years. The amount of energy used in a building for cooling, heating and lighting is directly related to its design layout, construction and materials used.

## OBJECTIVES

The main objectives of JENGA are:

- Academic capacity building at the participating four African Universities with a focus on sustainable housing design
- Involvement of stakeholders and regional dissemination of knowledge on energy-efficiency and sustainable housing
- promotion of joint programmes at BA/MSc level in the field of architecture/ construction
- synergies with other existing projects (e.g. UN Habitat/UNEP project EEBEA) to promote energy efficiency in the East African building sector



JENGA proposal: intervention logic (2012)

## METHODOLOGY

The central element of JENGA is the construction of three prototypes in student based design-build projects, showing energy-efficient design and low-carbon technologies. Each project is focused on one of the three JENGA themes: stack, slope and flood - thus reflecting necessities like densification in urban sprawl areas, context related design and resilience of buildings to the challenges of changing climatic conditions.

Concentrating on design and construction of full scale prototypes in various contexts, the programme will attempt at informing students and young staff not only on technical or economical necessities, but on the social, political, cultural and environmental context of their work. Ultimately, the goal is a transfer of know-how and an adapted transfer of technology (climatic conditions, indigenous and cultural values), embedded in the content of existing University courses and design studios.



Experimental house, built by students of UR (Rwanda)





JENGA project meeting at the UMU materials testing laboratory (Uganda)



JENGA project meeting at the JKUAT Environmental Lab, JKUAT (Kenya)



JKUAT students and staff on design-build construction site, Nairobi (Kenya)



Funded by the European Union



Implemented by the ACP Secretariat

ACP-EU Cooperation Programme in Higher Education (EDULINK)



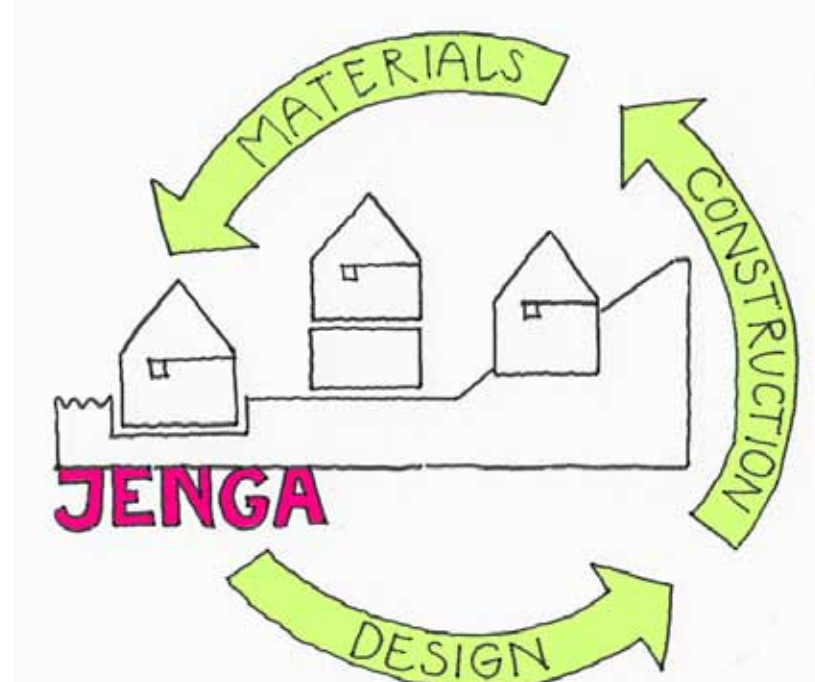
A programme of the ACP Group of States with financial assistance of the European Union

### CONTACT US

#### JENGA - PROJECT

Prof. Susanne Gampfer  
Augsburg University of Applied Sciences  
An der Hochschule 1  
86161 Augsburg - GERMANY

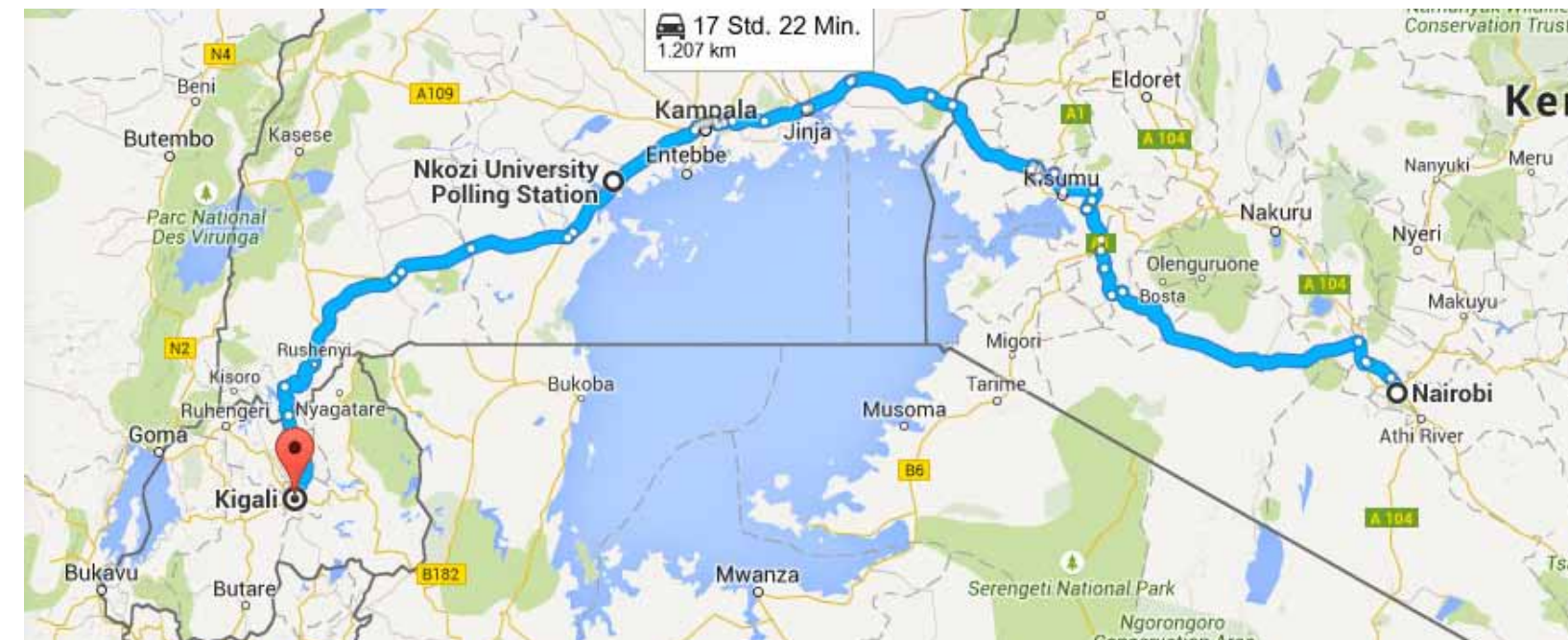
web \_ jenga-network.org  
mail \_ susanne.gampfer@hs-augsburg.de



## RESULTS PY 1 + 2

Staff members from all participating HEIs have continuously been involved in training workshops and multi-lateral visits. Teachers were trained to use practical teaching methods, expose their students to group work and to participate in joint studio teaching with colleagues from other institutions.

Close to the end of Project Year 2, the network was visibly linked by a road trip between the student design-build sites at each East African partner institution, bringing together staff and students from partner institutions. This led up to a public open house event with local stakeholders at the University of Rwanda's construction site.



JENGA road trip map and team, August/September 2015



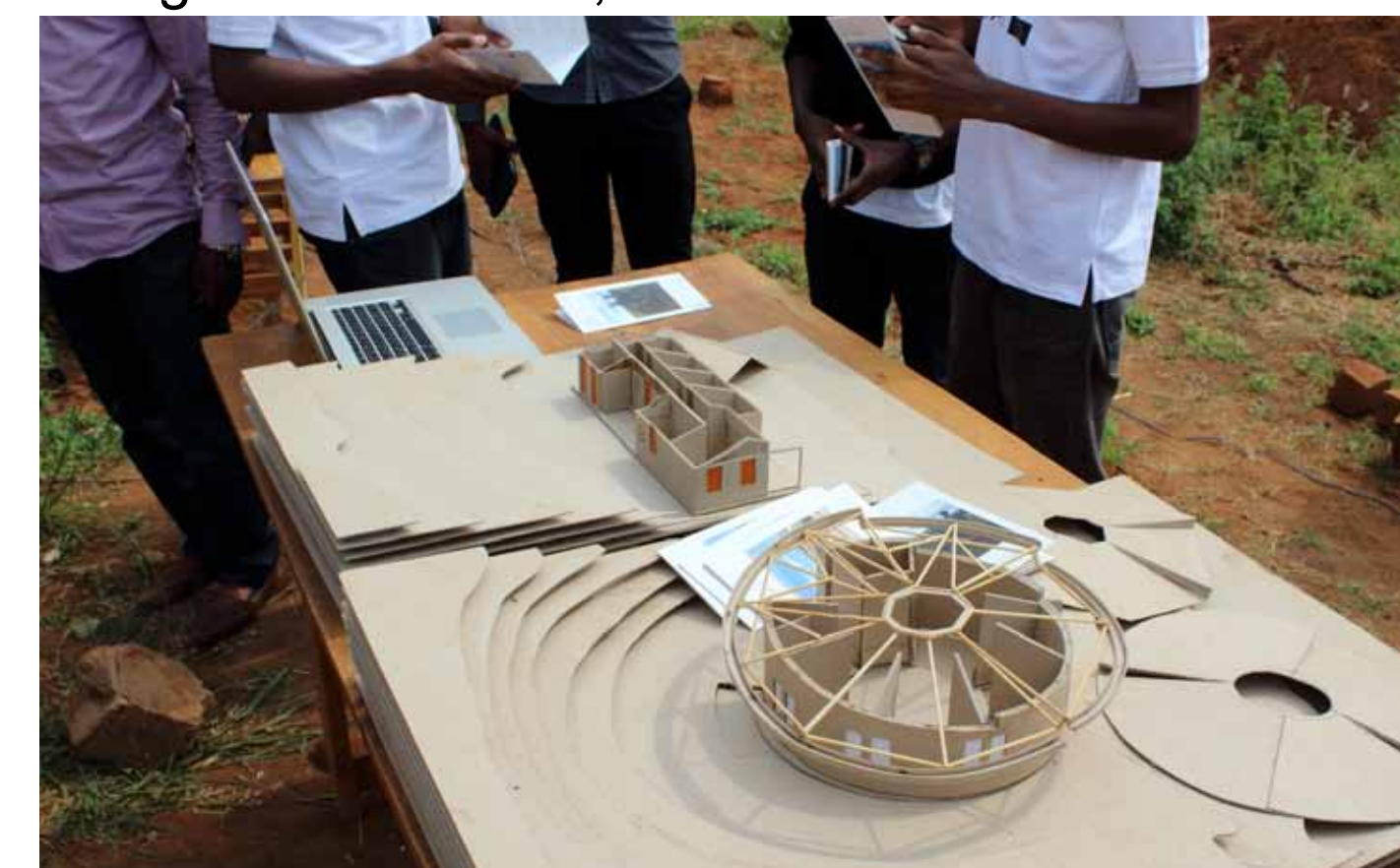
JENGA helped to identify a number of institutional and administrative challenges which need to be addressed by follow-up activities and discussed in the wider context of institutional development:

- it is difficult for teacher to modify realistic design briefs in order to meet existing curricular requirements and accreditation criteria
- implementing recurrent annual or bi-annual construction projects for their students is a challenge for teachers
- East African schools of architecture are understaffed, many of the teachers are part time
- group work of students in studio class is very uncommon and difficult to realise both for teachers and students
- implementation of contents and procedures at the involved academic institutions has been challenging and administrative support was not always sufficient
- long term scheduling and a critical analysis of institutional procedures will be necessary (longer than 3 years)

Some of these challenges have been taken up for further discussion by JENGA participants, namely a series of UN habitat curriculum development activities for Eastern Africa, which started in February 2016.



Design studio review, UR



Construction studio model review, UR



Stakeholders making clay bricks at UR design-build construction site, Rwinkwavu (Rwanda)

## IMPACTS AND CONCLUSION IN PY 3

JENGA successfully involved three levels of target groups:

- teachers at participating universities of Kigali, Nairobi, Kampala and Stellenbosch gaining knowledge problem based learning as a teaching method
- undergraduate and post-graduate students at the participating institutions, educating young local professionals to continue JENGA network in future
- policy makers and practitioners from the involved countries, in particular from the urban areas of Nairobi, Kigali and Kampala



The final JENGA event, Sustainable Futures Conference SFC 2016, to be held at the UN Headquarters in Nairobi, Kenya, addresses an international audience of academics, professionals, government and administration stakeholders with academic lectures and input sessions from UN Habitat. The three day event with a focus on architectural education and resource efficiency in building will bring together participants from around the world in August 2016.