



UNU Geothermal Training Programme

UNU-GTP AND GEOTHERMAL CAPACITY BUILDING IN AFRICA

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Uganda ARGeo C-2 – LSG – 24.11.2008



United Nations University

- Established in 1975
- Headquarters in Tokyo
- International community of scholars
- Think-tank for the United Nations system
- Builder of capacities, particularly in developing countries
- 13 UNU Research and Training Centres and Programmes around the world



UNU Geothermal Training Programme

United Nations University Geothermal Training Programme

- .. has operated in Iceland since 1979
- .. aims at assisting developing countries with significant geothermal potential to build up or strengthen groups of specialists that cover most aspects of geothermal exploration and development
- .. offers annually six months specialised training courses for professionals in geothermal work
- .. offers MSc. and PhD education in cooperation with Univ. Icel.
- .. offers short courses and workshops in recipient countries
- .. is hosted at Orkustofnun – National Energy Authority
- .. now the only international graduate school offering specialized training in all the main fields of geothermal science & engineer.



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Specialized training is offered in:

- Geological exploration
- Borhole geology
- Geophysical exploration
- Borehole geophysics
- Reservoir engineering
- Environmental studies
- Chemistry of thermal fluids
- Geothermal utilisation (engineering)
- Drilling technology



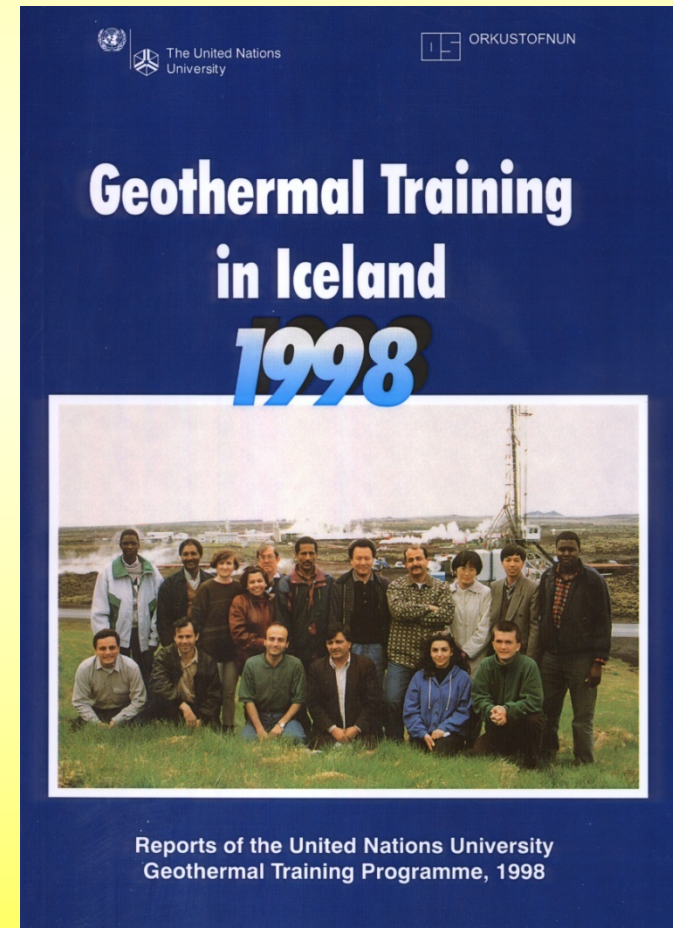
The training

- Is intended to provide participants with the ability to carry out independent execution of projects at home
- Starts with an introductory lecture course for basis
- Continues with 5-7 weeks of specialized training
- Includes field excursions to Icelandic geothermal fields
- Continues with a geothermal research project for 12 weeks and a report
- Includes training and use of computers
- Concludes with certificate from the United Nations University and Orkustofnun



Projects...

- Are selected from home countries if possible and data is available
- Otherwise, data is provided from Icelandic geothermal fields of similar characteristics
- Are published in our yearbook “Geothermal Training in Iceland”





Fellowships

- .. are awarded to candidates from developing countries and some transitional countries
- .. cover tuition fees, per diem and international travel
- .. financed by the Government of Iceland (95%) and the United Nations University (5%)



Candidates must...

- Have a university degree in science or engineering
- Have a minimum of one year practical experience in geothermal work, if possible for the country
- Speak English, the teaching language, fluently
- Have a permanent position at a governmental energy company, research institution or university
- Be selected by personal interviews during visits of staff members of UNU to their home country
- Be within 40 years of age unless in exceptional cases



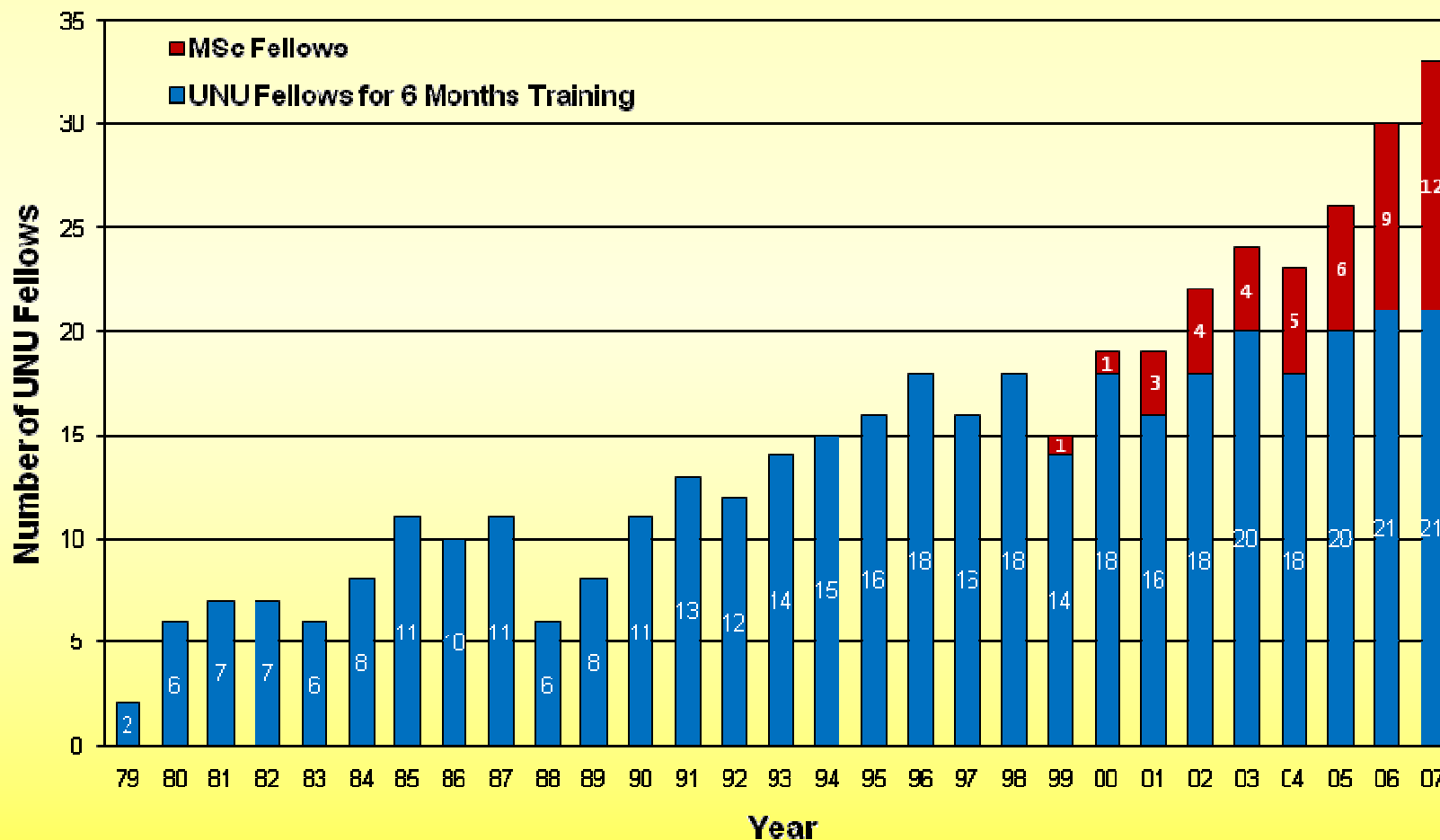
MSc & PhD education

- .. is offered in cooperation with University of Iceland
- .. Fellowships come from UNU-GTP, but the main part of teaching is at UI
- .. to be eligible the Fellows must have completed the conventional 6 months programme which counts as 30 points of 120 ECTS in the MSc requirements, and they should not be older than about 35 years
- .. the completion of the MSc degree should take 1½ - 2 years – now in 2008 sixteen MSc Fellows have completed MSc and nine are currently enrolled
- .. The first two PhD Fellows were enrolled this year



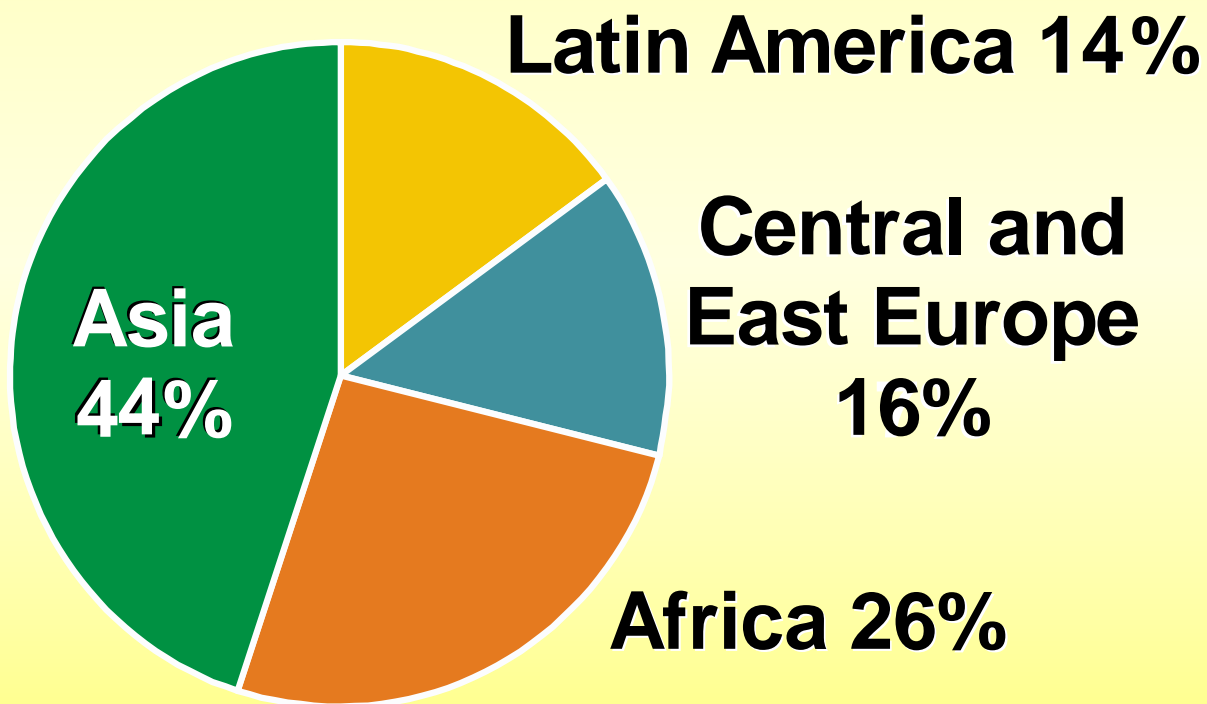
UNU Geothermal Training Programme

UNU Fellows completing 6 months courses and MSc students 1979-2007





Participation



- During 1979-2008, 402 scientists and engineers from 43 countries have completed the 6 months specialized courses
- Thereof 67 women (17%)



UNU-GTP – Short courses

- As a contribution to UN's Millennium development goals the Government of Iceland's has financed short courses in geothermal training held in various continents
- Started in East Africa with the "Workshop for Decision Makers in Geothermal" – held in Kenya in 2005 cooperating with a.o. KenGen and UNEP/GEF
- In 2006-2008, four short courses have been added to the series, three in Kenya in cooperation with KenGen and one in Uganda
- In 2006 similar series were started in C-America
- And in May 2008 new series started in Tianjin, China for Asia, focussing on LT utilization



UNU Geothermal Training Programme

World Geothermal Congress 2005

77 UNU Fellows from 25 countries presented papers



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Uganda ARGeo C-2 – LSG – 24.11.2008

30th Anniversary Workshop in 2008





Training of Africans at UNU-GTP

- First ones were the Kenyans: Joseph N'gan'ga, Martin Mwangi and Zack Muna in 1982 – all reached leading positions at KPC/KenGen – 39 Kenyans have followed in their footsteps - most of them are still active in geothermal
- In all, 26 Ethiopians have completed 6 months training, the first ones in 1983 – many have left geothermal due to wars or other reasons – however, a good nucleus is still left, at GSE lead by Meseret Teklemariam, the first black woman trained in Iceland, and at EEPCo led by the engineer Merga Tassew
- Good group is being formed in Uganda with 11 UNU Fellows, under the leadership of Godfrey Bahati, most still active
- Other countries are given their chances in relation with their activity in geothermal, such as Eritrea, Tanzania, Rwanda etc.



African UNU Fellows 1979-2008

(Red) = Women	6-months training			MSc programme		PhD pro.
	No. trained	Retired or not active	Available	Graduated	Studying	Studying
Algeria	3 (1)	3 (1)				
Burundi	1	1				
Djibouti	3	1	2	1		(1)
Egypt	4 (1)		4 (1)			
Eritrea	6	2	4		1	
Ethiopia	26 (1)	11	15 (1)		2	
Kenya	42 (6)	7	35 (6)	7		2 (1)
Rwanda	1		1			
Tanzania	4	1	3			
Tunisia	6		6			
Uganda	11 (1)	2	9 (1)	1		
Total	107 (10)	27 (1)	80 (9)	9	3	2 +1 (1)
Yemen	2		2			



UNU-GTP short courses in Africa

- First one was the “Workshop for Decision Makers in Geothermal” held in Kenya in 2005 in cooperation with KenGen - with about 30 participants from the six E-African ARGeo countries
- Since then short courses on exploration of geothermal resources have been held annually (2006-2008) with participants from now 14 countries mainly in E-Africa. The latest additions are Burundi, D.R. Congo and Zambia. About 100 persons have now attended these 2-4 week short courses
- The fifth course in the series was on geothermal project management and development”, held here in Entebbe last week with 22 African participants
- The short courses have proven a valuable addition to the training capacity – and a new channel for further training in Iceland

Workshop for decision-makers in 2005



Short course on surface exploration for geothermal resources in 2007



Short course on geothermal project management in 2008





Aims for 2009-2012

The deep financial crisis in Iceland may have some effect on our operations during the next 2-4 years. However, we still have strong support from the government. Therefore, I can say that

- Our core activity will continue to be the specialized six months training in Iceland, with hopefully some 20 Fellows annually
- For the MSc studies we hope to be able to award 4-5 new MSc fellowships annually
- Similarly, for PhD studies we hope to be able to award one new PhD fellowship annually
- Currently, further expansion of short courses may be difficult, but I can state that priority will be given to capacity building in Africa. Hopefully through development into a regional training centre operated by KenGen under the UNU-GTP umbrella



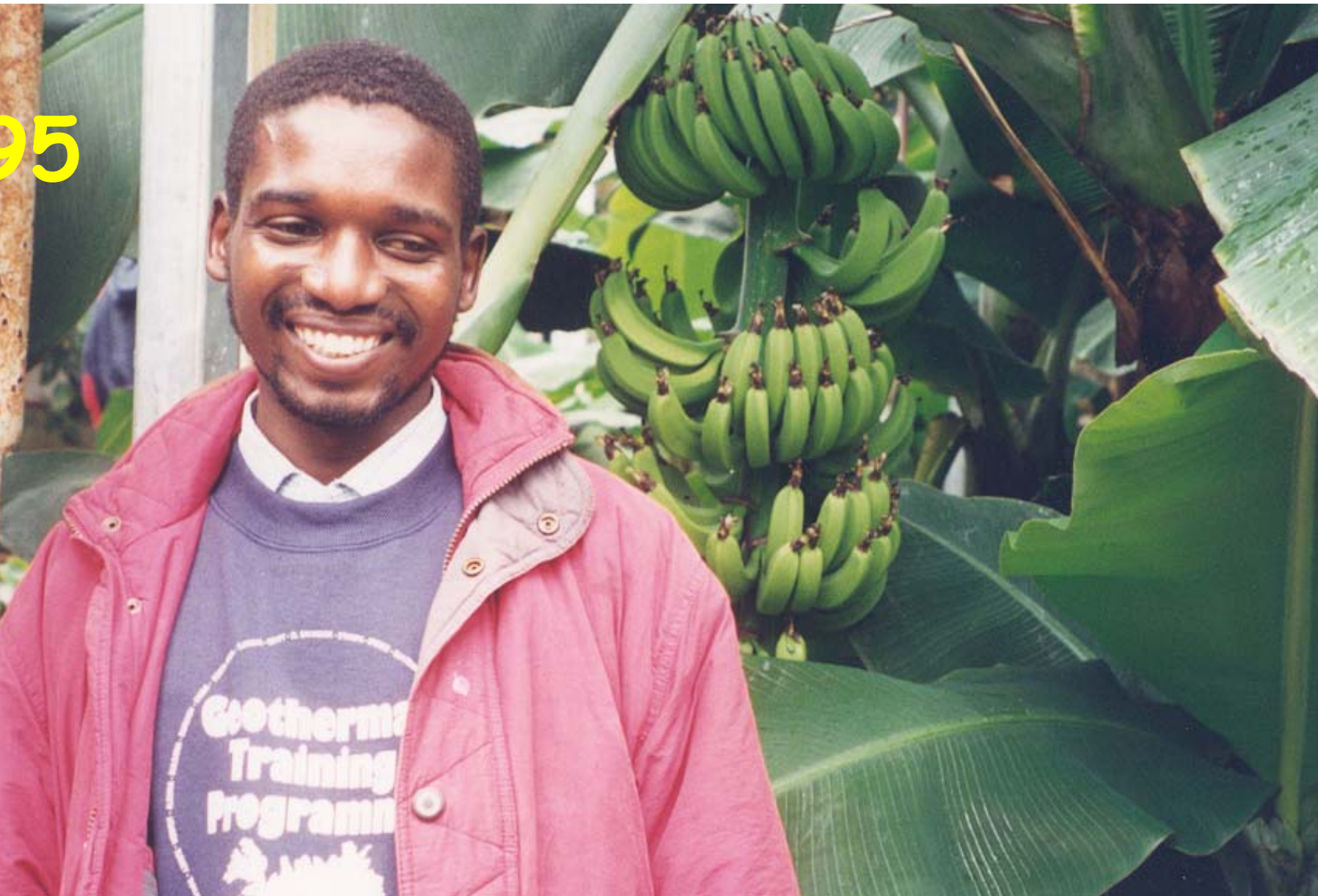




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Class of 2008



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