



POWERING AGRI-FOOD VALUE CHAINS WITH GEOTHERMAL HEAT

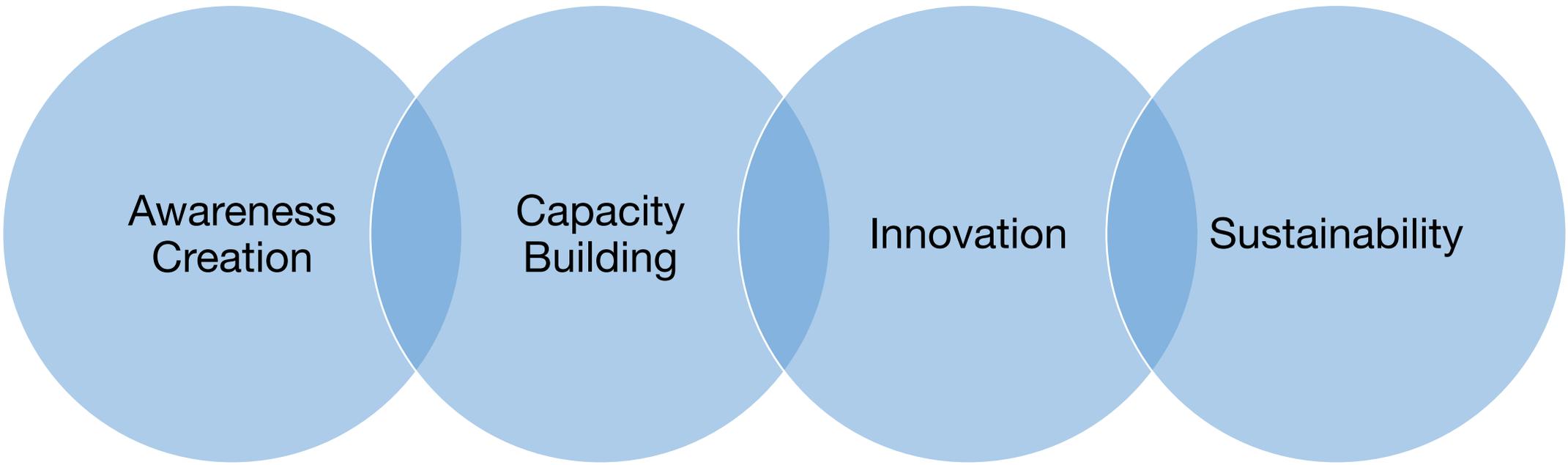
CAPACITY BUILDING, AWARENESS CREATION, SUSTAINABILITY AND INNOVATION

CAPACITY BUILDING EVENT – AFRICA WEBINAR

JULY 19, 2022



Knowledge Gaps along the Geothermal Direct Use Value Chain



Awareness Creation and Capacity Building

- ✓ Awareness creation to demonstrate the benefits and opportunities of agri-food applications for policymakers, entrepreneurs and communities; raise awareness at the local level given that geothermal heat, unlike electricity, is used locally
- ✓ Build capacity through academia and/or technical capacity building programmes for:
 - Geoscientists
 - Drilling Engineers
 - Project Managers
 - Environmental and Social Experts
 - Policymakers
 - Financiers
- ✓ Pilot projects help demonstrate the technical viability and can provide indications for the commercial viability of direct-use heating technologies

- ✓ Partnerships with international, regional and local institutions are important to provide training and certification programmes for technical experts, service providers and the downstream workforce to operate and maintain projects



Oserian flower farm at Olkaria, Kenya

Technical Capacity Building

International, regional and national training centres or programmes



Africa Geothermal Centre of Excellence, Kenya
Training courses



Andean Geothermal Centre of Excellence, Chile
Academic research



CeMIE-Geo, Mexico
Academy-industry alliance



East Africa Geothermal Energy Resource Facility: Ethiopia, Kenya, Rwanda, Tanzania and Uganda
Technical assistance and capacity building



Fraunhofer Institute for Energy Infrastructures and Geothermal Energy, Germany
Think-tank



Geothermal Institute: University of Auckland, New Zealand
Research, consultancy and training



University of El Salvador, El Salvador
Educational Programme



iiDEA Group, UNAM, Mexico
Research group



Sino-Icelandic Geothermal Training Program, China
Training Program

GRO • GTP

Geothermal Training Programme



© GRO Geothermal Training Programme
GRO GTP students visiting a greenhouse facility in Iceland.

- ✓ The GRO Geothermal Training Programme (GTP) in Iceland is one of the leading internationally recognised training programmes for capacity building of the global geothermal workforce, especially Africa, Asia, and Latin America and the Caribbean regions.
- ✓ Objective: Strengthen the capacities of their workforce at an individual and institutional level, aligned with achieving the Sustainable Development Goals
- ✓ A six-month-long training programme in Iceland (annually): Scientists and engineers receive specialised training and conduct a final research project. The trainees have access to the multidisciplinary research facilities of the host organisations.
- ✓ M.Sc. and Ph.D. scholarship programme at the University of Iceland and Reykjavík University: eligible for graduates of the six-month training programme who have not already received advanced university degrees.
- ✓ Workshops and short courses are offered in selected countries in Africa, Central America and Asia
- ✓ First online geothermal course offered in 2021 for decision makers with a focus on Africa, covering topics on geothermal potential and economic viability of electricity generation and direct-use applications in Africa.

Technical Assistance Programme in Central America



Promotion of Geothermal Energy in Central America (FoGeo-1) 2016 - 2020

1st phase

Capacity building and development of an enabling environment for investment to facilitate the implementation of agricultural and industrial heating applications.

Technical, commercial and social feasibility of select pilot projects were assessed for cascading and stand-alone opportunities in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama.



Geothermal Heat Utilisation for Industrial Processes in SICA Member Countries (GEO II) 2020 - 2023

2nd phase

Implementing pilot projects through policy dialogue, adaption of regulatory frameworks, knowledge dissemination, capacity building, stakeholder collaboration and project development.

Social and economic impacts for job creation and sustainable local community development.

Leveraging Technology, Sustainability and Innovation

Eco-Industrial Parks

- ✓ Model for utilising geothermal resources through innovative practices to generate revenue streams and reduce waste
- ✓ Incubation centres for innovation in the energy-food nexus
- ✓ Driving sustainability and new innovative technology

Circular Food Production

- ✓ Advantages of circular food production: optimization of energy and nutrient use, water treatment, and waste recovery processes when geothermal heat applications are implemented in agribusiness



Kalundborg Industrial Park
Sweden

Designed around a 1,500 MW coal-fired plant
Provided a blueprint of an industrial symbiosis network for neighbouring companies



Svartsengi Resource Park
Reykjanes peninsula, Iceland

Combined geothermal heat and power plant opened operations including Blue Lagoon spa and a dermatology clinic



GEOFOOD Project
Netherlands

Partnership between Iceland, the Netherlands and Slovenia
Integrates horticulture and aquaculture into a net zero waste production system heated using geothermal energy

Recommendations

Challenge/gap	Description	Recommendations/lessons learnt
Building local capacity, education and awareness	<p>There is a shortage of local skilled geothermal workforce in the public and private sectors.</p> <p>Awareness is limited about the potential and benefits of direct-use applications to improve the socio-economics of local communities.</p>	<ul style="list-style-type: none"> • Partner with international, regional or local institutions to provide training and certification programmes for the downstream workforce to develop, operate and maintain direct-use projects. • Raise awareness on the benefits and feasibility of direct-use projects among policy makers, communities and private sector agri-food industries. • Identify best practices and promote exchange of experiences and knowledge among countries and training centres at a regional level. • Build the capacity of public institutions to identify direct-use opportunities and assess their financial as well as socio-economic viability.
Leveraging technology, innovation and sustainability	<p>There is a need to use resources sustainably and minimise wastage.</p> <p>Innovation should be nurtured to enable the creation of new products and processes.</p>	<ul style="list-style-type: none"> • Encourage sustainability practices in the energy (geothermal) and industrial sector that aim to maximise energy use and minimise wastage of material through cascading and a circular economy. • Integrate incubation centres in geothermal utilisation, including by collaborating with research institutions, to promote the development of new products and processes through innovation.

THANK YOU!

