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External Evaluation of GRÓ International Centre for Capacity Development, Sustainability and Societal Change

Programme Evaluation Report - GTP

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ANNEX 11.3 PROGRAMME EVALUATION REPORT - GRÓ GTP

TRAINING PROGRAMME DESCRIPTION AND BACKGROUND CONTEXT

PROGRAMME DESCRIPTION, INTERVENTION STRATEGIES AND APPROACH (OVERVIEW)

Geothermal resources are distributed unevenly worldwide, and many low- and middle-income countries possess significant untapped geothermal potential. The most valuable resources are easily accessible with high temperatures and low levels of dissolved gases and chemicals. High-temperature geothermal fluids are primarily found near tectonic plate boundaries and local hot spots with substantial volcanic and seismic activity, such as the Pacific Ring of Fire, the East African Rift Valley, the North Atlantic Ridge, and the Lesser Antilles Island chain in the Caribbean. Medium to low-temperature resources are also present in other environments like deep sedimentary basins.[1]

Harnessing geothermal energy requires collaboration of different expertise. For instance, geoscientists explore and identify potential resources, drilling engineers design and drill wells to extract the fluids, reservoir engineers evaluate and manage the resource, and other engineers design and construct power plants, heating systems, and necessary infrastructure. Additionally, environmental scientists assess the environmental impacts of geothermal utilization, and project managers coordinate all these efforts. The GTP is a postgraduate training programme founded with the purpose of developing the necessary expertise to utilize geothermal resources in partner countries. As stated on the GRÓ website, GTP **aims at assisting lower to middle-income countries (LMIC) in capacity strengthening for geothermal exploration and development**.

For the last century, Iceland has increasingly used geothermal resources for various purposes including space heating, electricity generation, horticulture, aquaculture, industrial processes, snow melting, among other uses. In 2020, geothermal energy heated 90% of the homes, and geothermal power plants had an installed capacity of 755 MWe generating over 30% of the country's electricity. **This extensive use of geothermal energy has consequently contributed to the establishment of a large workforce in the geothermal sector. Consequently, Iceland is well-equipped to contribute to global geothermal development**[2]**.**

The GTP was founded in 1978 and began operating in 1979 with only two fellows receiving comprehensive training for close to six months. Since then, this six-month training has been the core activity of the programme and has operated on a yearly basis, except 2020 when it had to be postponed due to the COVID pandemic. From its establishment until 2023, 790 fellows have graduated from the programme. In the first three decades since the GTP was established the programme has continuously grown to accept more trainees and learning through more activities. Some new formats such as hybrid online courses were developed during the COVID-19 period (and replicated during following years), but overall, **the activities remained relatively unchanged**. The main change that occurred in the 6-month training programme was that during the 2010-2016 period the number of training participants per year

[1] Source: International Centre for Capacity Development, Sustainability and Societal Change, Theory of Change 2022-2027.
2 Source: Axelsson et al (2023) GRÓ Geothermal Training in Iceland: Geothermal Capacity Building in Developing Countries for 45 years. Proceeding of the World Geothermal Congress 2023.

was much higher, ranging between 28 and 34. Afterward, it was stabilized around 23-25 participants per year.

In 1999, GTP began supporting exceptional fellows of the 6-month training programme for further studies at the University of Iceland. Initially, the support was for MSc studies and adding PhD studies in 2008. In 2013 the GTP made a similar agreement with Reykjavik University. Since the GTP started supporting MSc and PhD students, 81 students have completed MSc degrees and 5 individuals have earned their PhD with GTP's support. Since 2005, short courses and workshops have been offered outside of Iceland on a regular basis in Kenya and El Salvador as well as other places based on particular needs. Recently, short courses have also been available online since the COVID-19 outbreak . As a result, more than 3,000 participants have benefitted from participating in 81 events. The last main component of GTP's training offer is the organization of regional 5-month training programmes. [3] They have been held in Kenya, China, and most substantially in El Salvador, for which an evaluative case study was developed (see Annex 12). GTP is also planning the organization of a regional and longer training in Kenya.

In summary, the main GTP activities are as follows:[3]

1. **Six-month training programme in Iceland** for approximately 24-25 fellows per year.
2. **Funding scholarships** for **MSc** and **PhD students** at the University of Iceland or Reykjavik University.
3. Organization of short courses abroad.
4. Supporting **the 5-month Geothermal Diploma Course** for Latin America in El Salvador.
5. **Other non-GRÓ funded training activities**, including customer designed courses and individual training.

As set in the 2022-2027 GRÓ Theory of Change (ToC), **the mission of GTP is to facilitate access to and promote utilization and sustainable management of reliable, economically viable, and environmentally sound geothermal energy resources for the improvement of human quality of life in LMICs through training and research in different aspects of geothermal development.**

The GTP works with selected low- and medium-income countries with proven and likely geothermal potential as well as intentions or policies to develop the resources. **To maximize impact, GTP collaborates with public institutions and companies in these countries that have been identified as playing a significant role in geothermal development**. Crucial current partners in low- and medium-income countries are LaGeo, a geothermal company in El Salvador; the Kenya Electricity Generating Company, KenGen; and the Geothermal Development Company (GDC) in Kenya.

While the target group is quite varied, it mainly includes early and mid-career professionals of public institutions and companies working in the geothermal sector.

EVALUATION FINDINGS

1. PROGRAMME GOALS, STRATEGY AND APPROACH (RELEVANCE)

1.1. ALIGNMENT OF THE PROGRAMME WITH ICELAND'S INTERNATIONAL DEVELOPMENT COOPERATION POLICIES AND ICELAND'S NATIONAL DEVELOPMENT VISION AND STRATEGIES

The evaluator judges that GTP's offer is closely aligned with and clearly relevant to the priorities of Icelandic development cooperation policy. There is a strong focus of GTP on supporting beneficiary partners and individuals in LMICs. **The use of geothermal energy and other renewable energy sources to pursue SDG 7 is an objective prioritized across Iceland's development cooperation efforts**.

[3] Source: Axelsson et al (2023) GRÓ Geothermal Training in Iceland: Geothermal Capacity Building in Developing Countries for 45 years. *Proceeding of the World Geothermal Congress 2023.*

As stated in the Icelandic parliamentary resolution on Iceland's Policy for International Development Cooperation 2019-2023, Iceland's development cooperation shall focus on areas where **Iceland's expertise can be applied in** the fight against poverty and in **reaching the Sustainable Development Goals (SDGs)**. The overall goal of Iceland's development cooperation is to reduce poverty and hunger, and to promote general well-being based on human rights, gender equality, and sustainable development. The policy also sets two secondary goals: **the protection of the environment and the sustainable use of natural resources.**

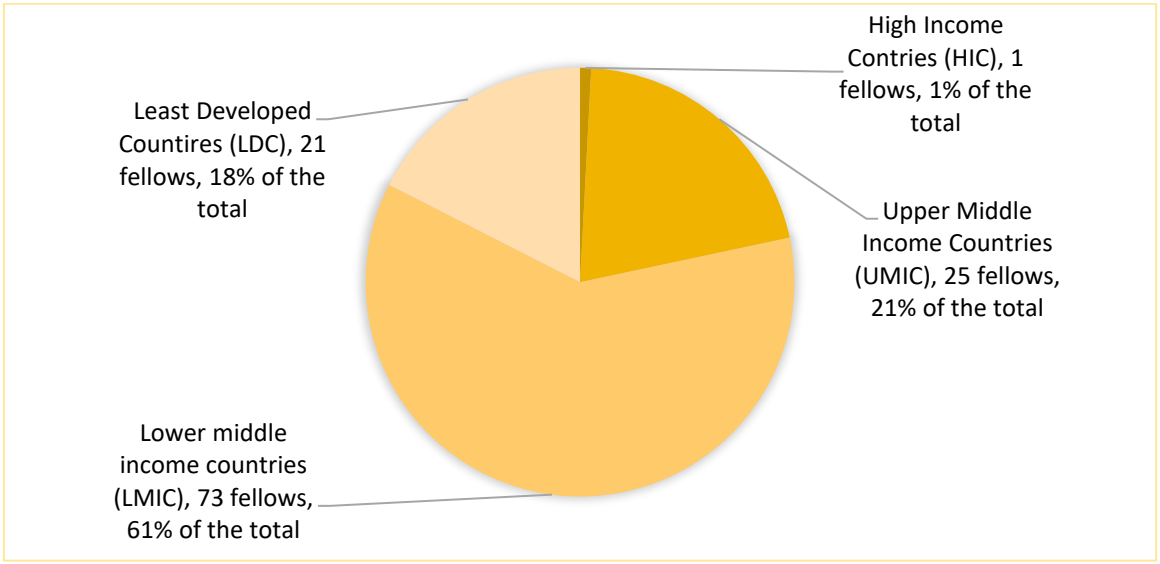
The protection of the environment and the sustainable use of natural resources involve increasing the resilience of societies and enhancing economic growth based on equal and sustainable resource use as well as taking measures against climate change. As specified in the parliamentary resolution, this includes increasing the use of geothermal energy and other renewable energy sources to pursue SDG 7.[4]

The mission of GTP to facilitate access to and promote the sustainable utilization of geothermal resources is fully in line with the parliamentary resolution on Iceland's Policy for International Development Cooperation 2019-2023. **Iceland has extensive and well-known experience in the field of geothermal energy. Therefore, utilizing Iceland's expertise in geothermal energy aligns well with the specifications of the parliamentary resolution, which advocates for applying Iceland's expertise to undertake both domestic and international projects**.

Overview of the GTP training delivered for benefit of partner countries, 2018-2023

During 2018-2023, GTP supported **120 fellows** in the **postgraduate level training programme in Iceland**, with 78% of the fellows coming from least developed countries (LDCs) or LMICs. This is entirely consistent with the goals of Icelandic development cooperation policy and its stated focus of **directing Icelandic support towards LDCs and LMICs**.

Figure 1: Overview of the GTP fellows in 6-months training in Iceland by income status of home country



Data source: statistics provided by GRÓ GTP

Since the establishment of GTP, fellows from 67 countries were trained. The GTP fellows from 2018-2023 came from 28 countries. 49 of the fellows (41%) came from seven countries in Sub-Saharan Africa, which is a priority region for Icelandic development cooperation policy. The main partner country for GTP fellows from 2018-2023 is Kenya (23%). Other Sub-Saharan African countries from which the fellows came include Ethiopia, Tanzania, Djibouti, Nigeria, Zambia, and Uganda. Uganda is also a priority country for Iceland. 36 of the fellows (30%) came from Asia: 16 (13%) from Indonesia and the rest from China,

[4] Ensure access to affordable, reliable, sustainable and modern energy for all.

India, Iran, Kazakhstan, Mongolia, the Philippines, and Vietnam. Thirty-three (28%) came from Latin America and the Caribbean (LAC). The main country in this region is El Salvador, from where seven fellows came (6%). The rest are from Bolivia, Colombia, Dominica, Ecuador, El Salvador, Guatemala, Montserrat, Nicaragua, Peru, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines. One fellow came from Algeria in North Africa (1%) and one from the Solomon Islands in Oceania (1%). **This distribution reflects the importance of geothermal resources for these countries**. The GTP fellows from 2018-2023 consisted of 50 females (42%) and 70 males (58%).

During the period of 2018-2023, GTP offered scholarships for master's degree studies to one MSc student from an MFA partner country, i.e. Uganda. No scholarships for doctoral studies were offered to MFA partner countries like Malawi, Uganda, or Sierra Leone or to priority countries like Mozambique. This is due to a lack of geothermal resources in these countries or a lack of policies to support the utilization of geothermal resources.

In the same period, short trainings were organized in Kenya and El Salvador through UNU-GTP or GRÓ funding. Other short trainings were organized in Rwanda, Eritrea, Djibouti, and Iceland through other funding sources like the MFA. In total, 422 individuals (148 females and 274 males) were reached through 12 training events. Four training events were held in LDCs and seven were in LMICs.

Additionally, four online training events were organized with 396 participants from various countries. Three of these were funded by GRÓ while the fourth was funded by the MFA outside the GRÓ budget.

1.2. ALIGNMENT OF THE PROGRAMME WITH THE PARTNER COUNTRIES' AND TARGET GROUPS' NEEDS AND PRIORITIES, POLICIES AND STRATEGIES

The evaluator judges that GTP is clearly aligned with and relevant to partner countries' and target groups' needs, priorities, and strategies, especially regarding policies and strategies on electricity generation from geothermal resources. The level of demand for the fellowship training programme is strong, clearly demonstrating that it aligns with needs and local priorities.

The reduction of greenhouse gases through an increased generation of electricity from renewable energy – specifically including geothermal energy – is an explicit objective of the Nationally Determined Contributions (NDC) for the energy sectors of key partner countries from where numerous students have been intentionally trained. These include El Salvador, St. Vincent and the Grenadines, Dominica, Mexico, Tanzania, and Djibouti. In addition, **a greater exploitation of geothermal resources is mentioned as a key strategy to achieve objectives included in planning documents of countries, which, have also provided a high number of trainees for GTP**. These documents include the Kenya Vision 2030 and Ethiopia's Low Emissions and Climate Resilience Development Strategy (2020-2025). In this way, **GTP is well aligned with the policies and strategies of partner countries.**

The GTP specifically targets early and mid-career professionals who are in a potential position to boost the exploitation of geothermal resources in their own countries. The fellows are young professionals who have already graduated from local universities and are seeking to deepen their understanding of geothermal energy. An analysis of the survey results shows **that the vast majority of fellows work in public institutions or in public sector enterprises. More precisely, 53% of the fellows were working in public institutions when they enrolled in the 6-month training programme, 21% in public sector enterprises**, 16% in academia or research institutions, 7% in private companies, and the rest in national civic society and non-government organizations, international non-government organizations (NGOs), or are self-employed. Overall, GTP responds to the needs and priorities of individuals seeking to extend their knowledge and practical skills linked to the exploitation of geothermal resources in their home countries.

Although the evaluation team has no precise data on the organizations for which **beneficiaries of short training work, their distribution is probably like that of the 6-month training programme** since similar criteria are used to select short training participants. The main expected difference is that for short training a proportion of trainees come from the same organizations organizing the training together with GTP.

In this regard, three key GTP partner organizations are LaGeo in El Salvador, the Kenya Electricity Generating Companies (KenGen), and the Geothermal Development Company (GDC). These state-owned companies with expertise in the exploitation and utilization of geothermal resources regularly contribute to the organization of short trainings. Additionally, LaGeo also organizes an intensive 5-month diploma course. These partner organizations are committed to expanding the pool of geothermal experts in their regions. By participating in GTP training programmes, they also benefit by training their personnel and enhancing their reputation as leading companies in geothermal energy.

1.3. ALIGNMENT OF THE PROGRAMME WITH INTERNATIONAL DEVELOPMENT POLICY FRAMEWORKS, GOALS, AND STRATEGIES

The evaluator judges that GTO closely aligns with and is relevant to promoting an understanding of the international development policy frameworks, goals, and strategies for greenhouse gas mitigation and the Paris Agreement on Climate Change., It also advances gender equality and women's empowerment. The work of the programme contributes to the UN SDGs, particularly SDG 7 (Ensure access to affordable, reliable, sustainable and modern energy for all).

Overall, the purpose of GTP is to assist countries with significant geothermal potential in training groups of specialists to work in various aspects of geothermal exploration and development. This strengthens their capacity to develop and utilise their geothermal resources and to reduce use and dependence of fossil fuels.

Geothermal energy is considered a renewable energy source. With very few exceptions, the amount of greenhouse gases emitted from geothermal power plants is extremely low. Therefore, a greater utilisation of geothermal resources contributes to international climate change mitigation commitments.

More precisely, **promoting the utilisation of geothermal resources as an energy source contributes to SDG 7 and aligns with Iceland's international conventions and obligations, such as the Paris Agreement on Climate Change**. By focusing on strengthening capacity in geothermal exploration and development in LMICs, **GTP also contributes to Iceland's commitments under the Paris Agreement, which emphasise climate-related capacity-building for partner countries and calls on developed countries to enhance support for capacity-building actions in partner countries.**

1.4. Quality of the programme design and management approach

The evaluator judges that GTP is well designed and steered to deliver its intended benefits to the direct beneficiaries of the programme. The programme offers a coherent mix of training interventions targeting young and mid-career professionals with a tailored training offer of different levels of intensity. There is a good level of synergy and focus across the training offer mix.

The programme provides a coherent mix of training interventions. The core of the training proposals is the 6-month training programme, which provides fellowships for 24-25 trainees each year. After an initial 6-week introductory period, fellows split to attend specialized training through lectures, practical work, and visits to geothermal sites for another period of 5 to 6 weeks. **Fellows can choose from eight different lines of specializations**[5] that provide practical specific training. Typically, up to five of the eight lines of specialization are offered per year. The final period of 12 weeks is devoted to individual research projects under the guidance of a supervisor. **The individual project is chosen to have a direct relevance to the work of the fellow at home to offer a valued specialization opportunity for fellows.**

A different approach is used in El Salvador through the 5-month regional diploma where approximately 30 trainees attend all modules for the whole duration of the diploma. The only specialization opportunity is the one-month final project. Interviews and focus group discussions (FGD)

[5] These are: geothermal geology, geophysical exploration, reserve engineering and borehole geophysics, chemistry of geothermal fluids, environmental science, geothermal utilization, drilling technology, and project management and finance.

with alumni of the diploma revealed that this approach helps students learn the jargon, main tools, and technologies used in all the different facets of a geothermal development project. This is important since geothermal development projects need a wide variety of experts. However, as the evaluative case study reports, such a general coverage approach **limits specialization opportunity**. It should also be noted that the diploma in El Salvador focuses more on geothermal resources in volcanic areas which are particularly relevant for the region.

In addition to the trainings mentioned above, scholarships for MSc ad PhD students. While the offer of scholarship is quite flexible (depending also on applications), in practice, four or five MSc scholarships has been offered per year during the 2018-2023 period. In the same period, GTP funded one PhD scholarship per year until 2021, three PhD scholarships in 2022, while no PhD scholarships were provided in 2023. The overall objective of the scholarships is to enable graduates of the 6-month training in Iceland to pursue further specialization with the University of Iceland or Reykjavik University. Having attended the 6-month training programme fulfils 25% of the ECTS credits required for the MSc degree.

Finally, GTP offers three main types of short trainings: 1) one or two-week training in El Salvador completely funded by GRÓ and whose specific topics are different for each training edition and are decided in agreement with the trainees' home organizations, thus ensuring that the training provided is relevant for the needs of partners in the region; 2) three-week training in Kenya covering all main aspects of early stages of geothermal development, which tend to be similar from year to year and are also funded by the two partner organizations in Kenya; and 3) tailored trainings on different topics that serve as a platform for discussion for more in-depth training for experts around specific topics, usually funded by the MFA outside of the GRÓ budget. All trainings cover a theory component but also include practical applications of the skills and tools that have been acquired.

This diverse range of training options facilitates the selection of suitable candidates for the more intensive training programmes. Specifically, short trainings are often used to observe and choose potential participants for the 6-month training in Iceland or the 5-month diploma programme in El Salvador. Successful completion of the 6-month training is a prerequisite for scholarships for MSc and PhD programmes.

During the last year, GTP was managed by three full-time staff members: one programme director, one deputy director, and one project manager. **Without additional temporary support from ÍSOR, GTP had to postpone certain tasks, such as the review of the final project reports of the 6-month training programme prior to publication**. At the time of writing this report, the most recent published final project work report written by a 6-month fellow dates to 2021. During the summer of 2024 a new position was created: the senior specialist. So currently, GTP has 3.5 permanent staff.

The management of specific programme interventions with key partners in partner countries is derived from established formal institutional arrangements for collaboration.

2. PROMOTION OF SYNERGIES BETWEEN THE PROGRAMME AND OTHER LOCAL DEVELOPMENT EFFORTS (COHERENCE)

2.1. COHERENCE AND SYNERGIES BETWEEN THE WORK OF THE PROGRAMME AND ACROSS DIFFERENT DEVELOPMENT EFFORTS BY ICELAND IN PARTNER COUNTRIES OR REGIONS

The evaluator judges that **GTP complements other development** efforts funded by the government of Iceland only **to a very limited extent**. **Synergies with other projects are now outdated and the GTP initiative has not received recent funding within the framework of other interventions**. Additionally, the choice of priority countries is understandably guided by the potential for geothermal resources development rather than coherence considerations with bilateral interventions.

The data on the countries where trainings are organised, and the origin of trainees indicate that the main training activities are not fully coherent with Iceland's development efforts in its partner countries. In the 2018-2023 period, only two fellows of the 6-month training programme in Iceland came from one of the three Iceland partner countries for bilateral cooperation, both from Uganda. Also, only one MSc scholarship recipient is from one of the three partner countries, also from Uganda. **This**

misalignment is because GTP has focused on countries with significant geothermal development potential, which is still relatively limited in Malawi and Uganda and likely non-existent in Sierra Leone.

Until 2017, GTP actively participated in MFA-ICEDA funded development projects aimed at building local capacities through bilateral initiatives, primarily geothermal exploration in Djibouti, Ethiopia, Kenya, Rwanda and Tanzania. These projects and organized trainings were signed in 2013 or 2014 and lasted until 2018. That project was implemented in collaboration with several partners including UNEP, the World Bank, and the African Union. The main objective of that project was to assist countries in the East Africa Rift System to analyse geothermal potential by conducting reconnaissance and surface exploration studies and to build capacity and expertise in the field of geothermal development and utilization. Involved partner countries were Ethiopia, Djibouti, Kenya and Tanzania. Within this project UNU GTP organized several trainings in partner countries and Iceland. It is worth noting that the final evaluation of the project concluded that the" framework agreement" between the project and ÍSOR and UNU GTP appears to be a value for money response.[6]

Apart from the above outdated cases, synergies between the work of GTP and development efforts by Iceland in partner countries appear to be limited.

2.2. COHERENCE AND SYNERGIES BETWEEN THE WORK OF THE PROGRAMME AND OTHER DEVELOPMENT EFFORTS BY THE KEY PARTNERSHIP ORGANIZATIONS OR BY OTHER DONORS IN PARTNER COUNTRIES OR REGIONS

The evaluator judges that **GTP complements the wider development efforts of the programme's key partner organizations in partner countries** of public geothermal or electricity companies. The programme also complements wider training efforts of other international financial institutions to promote capacity development and the success of investments in geothermal exploration.

The key partner organisations for GTP in partner countries are geothermal companies, namely LaGeo in El Salvador, the Kenya Electricity Generating Companies (KenGen), and the Geothermal Development Company (GDC) in Kenya. These are all state-owned companies with expertise in the exploitation and utilisation of geothermal resources**.** They regularly contribute to the organisation of short trainings, and LaGeo in El Salvador organises an intensive 5-month diploma. **While these three partner organisations have clearly demonstrated a commitment towards expanding the pool of geothermal experts in their region, they also directly benefit from GTP training offer by training their personnel and positioning their organisation as companies with well-reputed expertise in geothermal energy in the region**.

In addition to these three partner companies, GTP also regularly collaborates with organizations in Indonesia, the Philippines, China, and Colombia, which regularly nominate candidates for the 6-month training in Iceland. Partner companies in Colombia also send employees for trainings in El Salvador. In China, GTP has offered an advisory role to the newly established Sino-Icelandic GTP, which is managed by Sinopec. Cooperation was also established with the World Bank on an ad hoc basis.

The training activities implemented by GTP also complement the programmes funded by other international financial institutions. Since 2006, GTP has provided support to the KenGen training objectives in Kenya to organise introductory short courses on geothermal energy. These lasted two weeks until 2008 and three weeks since then. The Geothermal Development Company (GDC) became another important partner in 2009, which participated in the delivery of short courses together with KenGen. So, since 2009 GDC was also supported by GTP. Additionally, every year some KenGen staff attend the 6-month training in Iceland. GDC has also sent staff to be trained in Iceland (especially in the 2010-2015 period) at their own cost, but their participation has been less regular than for the case of KenGen. The participation of KenGen staff in the 6-month training in Iceland is often funded by KenGen own resources or by projects that the World Bank Group channels through beneficiary countries through

[6] Source: GOPA (2019) External Final Evaluation of the Geothermal Exploration Project. GEP/ICE23066-1301

KenGen. In this regard, in 2019, the World Bank funded a 5-year project supporting 17 training centres in Kenya, Uganda, and Tanzania. The KenGen training centre was selected as the TVET reference training centre for energy topics. While most of the World Bank grant investment is for infrastructure upgrade, a large remainder is for training KenGen experts. In this ways, GTP short training at KenGen will benefit from the World Bank investments.

The case study for El Salvador shows that GTP training activities organised with LaGeo complements the technical assistance and capacity building project on geothermal exploration funded by the German government and implemented by the Federal Institute for Geosciences and Natural Resources (BGR) for the Central America Integration System member countries. The development of technical knowledge that GTP is promoting through training is highly relevant for the BGR project; the project even has two trainees who have been accepted for the diploma training programme in El Salvador.

Improvements in skills and knowledge are crucial for the success of grants and loans provided by international organisations to support the development of geothermal projects. The Inter-American Development Bank has stated in a recent analysis[7] that grants and concessional funding programmes will continue to play a vital role in increasing the feasibility of geothermal projects in LAC.

2.3. DUPLICATION OR OVERLAP OF THE PROGRAMME ACTIVITIES WITH OTHER EFFORTS BY ICELAND OR OTHER DONORS

The evaluator judges that there is no duplication or overlap of GTP activities with the other development efforts of Iceland or other donors.

This evaluation found no evidence of duplications of the GTP activities with other development efforts by Iceland or other donors. The tailored short trainings held by GTP, which are often funded by the MFA, are targeted at a different audience than those funded by GRÓ, meaning no risk of duplication.

There is no evident risk of duplication given that the majority of Iceland's multilateral development cooperation support is intended to assist partners in addressing local development or humanitarian needs.

3. PROGRESS TOWARDS RESULTS (EFFECTIVENESS)

3.1. EFFECTIVENESS OF THE PROGRAMME OVERALL IN REGARD TO THE DELIVERY AND THE ACHIEVEMENT OF THE INTENDED OUTPUTS

The evaluator judges that **GTP is highly effective in delivering outputs and providing training outreach with 1,067 individuals directly reached through its training offer during the period 2018-2023**. In that period, 120 fellows have graduated with a diploma from the fellowship training programme in Iceland, 86 individuals have graduated from the regional 5-month diploma in El Salvador, 7 scholars have been supported to in their doctoral research studies and 24 students to take an MSc programme. Additionally, 422people were trained through short courses in partner countries, and 396 learners accessed the online training. **The beneficiaries positively rate the quality and relevance of the training and the knowledge transmission**.

A summary of the principal programme **outputs** delivered between 2018 and 2023 can be found below in Table 1 and in figures 53 and 54 below.

[7] Gischler, G. et al (2020) Harnessing geothermal potential in LAC: A perspective on the road ahead. IADB

Table 1: The GTP main training activities via the programme in the 2018-2023 period

INTERVENTION	PRINCIPAL OUTPUTS DELIVERED/ACHIEVED
Postgraduate training in Iceland (Fellowship)	• **120 fellows from 28 countries** participated in the 6-month, of which **50 were female** (42%) and **70 were male** (58%). 18% were from LDCs, 61% from LMICs, 21% from UMICs, and 1% from HICs. Geographically 41% came from Sub-Saharan Africa, 30% came from Asia, 28% from LAC, and the remaining 1% from North Africa and Oceania. • Four to five different lines of specialization are offered each year. • Survey results show that 2018-2023 GTP fellows rated the programme's overall **quality (4.79 out of 5)** and **coherence (4.76 out of 5)** very highly. They also report **substantial or large skills improvements (4.18 out of 5)**, specifically in the fields of research skills, interpersonal skills and personal development.
Doctoral scholarships (PhD research)	• **Seven students (three female and four male)** have received scholarships (for doctoral studies. **Four were from the LDCs** Djibouti, DRC, and Tanzania which had two doctoral students, while **three were from the LMICs** of Kenya, Bolivia, and India. • Two scholars have earned their PhDs and one more is expected to graduate soon. • The doctoral students have published **seven research papers**.
MSc scholarship	• **27 (11 female and 16 male) students have received scholarships** for MSc studies. • Nine were from LDCs (33%), 17 were from LMICs (63%) and one was from a UMIC (4%). • **29 students (12 female and 17 male) have obtained an MSc degree** from the University of Iceland or Reykjavik University.
Short courses in partner countries & online courses	• **13 training events were delivered in six countries:** Iceland, Kenya, El Salvador, Djibouti, Eritrea, and Rwanda. Seven of the 13 training events were funded by GRÓ and took place in Kenya and El Salvador. • The GRÓ-funded **three-week training in Kenya on geothermal exploration and development of geothermal resources** was delivered five times reaching 205 total participants (75 women and 130 men). Two different one-week GRÓ-funded trainings were organized in El Salvador reaching a total 122 participants (49 women and 73 men). Overall, 327 individuals (124 women and 203 men) participated in GRÓ-funded trainings. • **422 individuals (148 female and 274 male) in total participated** in in-person short trainings held in person when including non- GRÓ funded training. • Four **online 2-day training events** were also organized, three of which courses were funded by GRÓ. **396** (172 female and 269 male) individuals participated in the online training. • The percentage of fellows who were involved in short courses after their graduation from the training programme in Iceland is highest among GTP fellows.
5-month diploma in El Salvador	• The **5-month diplo**ma named "Geothermal Diploma Course for Latin America" Was carried out in 2018, 2019, and 2022 reaching **86 participants** (37 female and 49 male). • 78% of the diploma participants came from LMICs; 63% were from El Salvador. • The 5-month diploma covered all main aspects of geothermal resources utilization in its 11 modules. • Participants reported a **high level of satisfaction** with the programme in their final survey.

INTERVENTION	PRINCIPAL OUTPUTS DELIVERED/ACHIEVED
Capacity development partnerships	• During 2018-2023, GTP operated in cooperation with **three different companies** for the organization of GRÓ-funded training activities: LaGEO in El Salvador, the Kenya Electricity Generating Company (KenGen) and the Geothermal Development Company (GDC) in Kenya. • Other cooperating institutions of non-GRÓ funded training included the United Nations Environment Programme (UNEP), the Icelandic MFA, the Organization for Security and Cooperation in Europe, and the Eritrean Ministry of Mines and Energy.

The GTP has successfully engaged with a diverse range of learners from partner countries as direct beneficiaries. This achievement has been made possible through a variety of different training interventions. The programme has prioritized strong engagement with trainees from LDCs or LMICs, with the latter being the great majority (see above Table 1).

Figure 2: GTP Fellows 2018-2023 by gender region

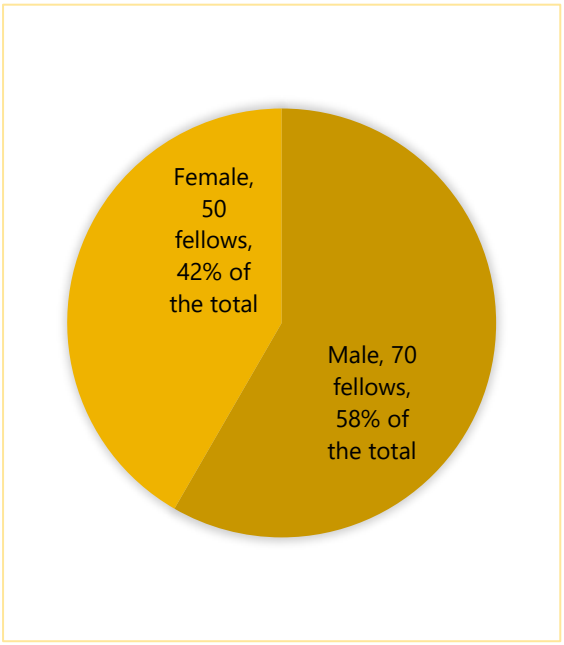
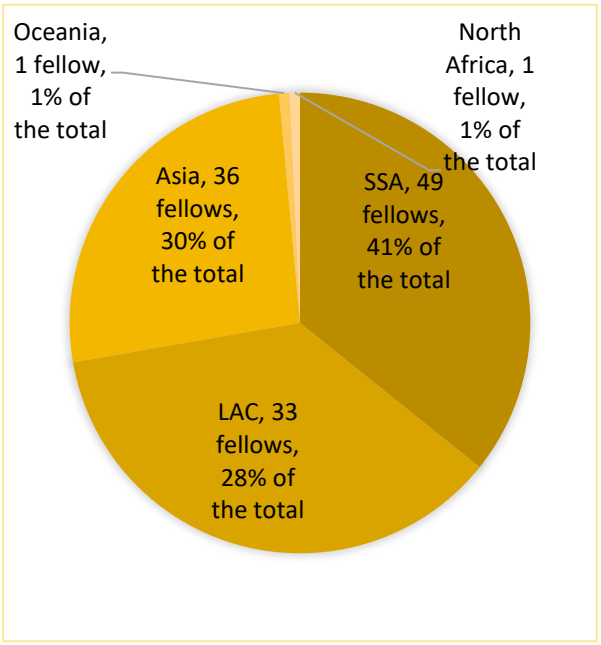


Figure 3: GTP Fellows 2018-2023 by geographical region



Data source: statistics provided by GRÓ GTP

As per GRÓ Results Framework, the expected effectiveness at the output level consists of 1) Increased capabilities and expertise of partner organizations, 2) Production and dissemination of new knowledge, 3) Professional empowerment through networking and community building. Main elements of analysis of the expected outputs are reported in Table 34.

Table 2: the GTP's 6- month training outputs as reported in the evaluation online survey

DOMAIN	MAIN OUTCOMES
Skills improvement	• When the 2018-2023 cohort of respondents of the evaluation online survey were asked to rate the extent to which the post-graduate 6-month training contributed to improving skills on a scale from 1 (no improvement) to 5 (large improvement) the highest scores for 2018-2023 GTP fellows were for **research skills (4.53), technical skills (4.48), and personal development (4.47)**. The lowest scores were for environmental and climate affairs. The average score across all assessed type of knowledge/ skills was **4.18 out of 5 for the 2018-2023 graduates**, suggesting that the programme strongly contributed to skill improvement. • While all training components were highly appreciated (no training component had a score lower than 4.5, on a scale from 1 to 5), 2018-2023 GTP fellows deemed individual **research projects and fieldwork to be the most valuable training modules, both with an average score of 4.75**.
Research delivered	The 2018-2023 GTP survey respondents developed a number of research and knowledge outputs linked to the training programme in Iceland: • **97%** of respondents delivered a **final project report** • **50%** of respondents delivered an **MSc thesis** • **34%** of respondents developed a **conference paper** (the highest percentage among the four training programmes) • **14%** composed a **policy report** • **11%** published a **journal article** • **3%** of the respondents delivered a **PhD dissertation**
Alumni empowerment	• A total of **117 training fellows or former fellows were supported to attend the World Geothermal Congress** (WGC) in 2020 (postponed to 2021) and 2023, with 69 individuals participating in the 2020 WGC and 48 in the 2023 WGC. GTP financed this outside of GRÓ's core funding through funds accrued from training activities in past years. • Former GTP fellows or scholarship recipients **lectured and presented their research** in 12 training events and four online trainings. • The GTP organized side events at the WGC with former and current fellows and held an anniversary workshop in 2018 in Iceland. Former fellows were invited to give presentations on the impacts that GTP had in their countries. • In 94% of the short courses and diploma events of the 2018-2023 period, GTP involved former fellows in teaching and organization

Alumni empowerment was promoted by directly inviting former fellows to contribute to teaching and lecturing in short courses and by sponsoring their participation in the World Geothermal Congress (WGC). This event, now held every three years, was reported to be crucial for current and former fellows to present their research work and actively engage in networking.

3.2. EFFECTIVENESS OF THE DIFFERENT PROGRAMME INTERVENTION STRATEGIES AND OF LOCAL PARTNERSHIPS IN REGARD TO THE DELIVERY AND THE ACHIEVEMENT OF OUTCOMES

The evaluator judges that the training activities have contributed to outcomes in skills development and to advancing the careers of beneficiaries in their home countries. Exchanges of experiences among beneficiaries are a main element through which GTP contributes to the advancement of geothermal resource utilization.

6-month training in Iceland

Table 3 35 below defines the main changes at the individual, that GTP has contributed to, based on the results from the online survey evaluation.

Table 3: the GTP's 6- month training direct outcomes at the individual level, as reported in the evaluation online survey, 2018-2023

DOMAIN	MAIN OUTCOMES
Career advancement	• When asked to what extent their professional career has advanced due to the participation in the 6-month postgraduate training programme in Iceland, **68% of the 2018-2023 GTP survey respondents report that they have extremely or substantially advanced**. Further 25% report moderate advancement and only 8% report no or slight advancement. It should be noted that the percentage of GTP fellows, who have extremely or substantially advanced is higher for older cohorts (81% for GTP fellows before 2017), most likely due to the fact that they have had more time to advance professionally after programme graduation.
Type of professional career advancement	2018-2023 advanced their career in different ways: • 78% of respondents reported having more responsibilities • 31% reported having gained a scholarship • 24% reported a promotion • 20% of respondents reported a salary increase • 12% reported having a new job • 4% reported starting a new business

Based on the feedback received from direct beneficiaries of the 6-month training and the results of the survey reported in Table 36, **it is evident that the quality and relevance of the training provided by GTP have played a significant role in enhancing individual competences, knowledge, and skills related to the utilisation of geothermal resources**. The fact that the training is delivered **by industry experts and seasoned professionals** was highlighted in the qualitative answers to the online survey as a key factor in maintaining the relevance and up-to-date nature of the curriculum aligned with current industry practices.

Additionally, a significant strength noted among the qualitative answers to the online survey was the programme's **emphasis on practical and field-based learning, including field trips and hands-on projects** that complement theoretical knowledge.

A key for reinforcing individual skills is the **final research project**. As confirmed by the interviewed fellows of the 6-month training in Iceland, the final project represents a unique **opportunity for specialisation** in a field as diverse as geothermal development. The case study on the training activities in El Salvador reports that similar considerations apply to the final project of the 5-month Geothermal Diploma Course for Latin America.

According to the results reported by the 6-month training fellows included in Table 3 above, **completing the 6-month trainings was considered very beneficial for advancing the careers of former fellows.** The most common forms of professional career advancement were taking on more responsibilities, receiving a scholarship for further studies and receiving a promotion.

The results of the survey also suggest that the 6-month training in Iceland was highly appreciated by the institutions for which fellows work. Around 86% of the 2018-2023 (strongly) agreed with the statement that their organisation's management appreciates and values the skills they have gained from the postgraduate training programme.

The survey results find that the knowledge from the postgraduate programme is actively spread in institutions and the technical sector after programme completion. 78% of the 2018-2023 GTP fellows have shared their knowledge from the postgraduate programme with their supervisors, colleagues and a broader expert network.

Similarly, **the survey results suggest that former fellows contributed to their subject area with the knowledge they acquired.** 89% of the 2018-2023 GTP fellows (strongly) agree with the statement saying that they were able to advance their contribution in their field/subject area thanks to the postgraduate training programme.

The survey also offers additional insights on fellows' actual contributions, as reported in the Table 4 below.

Table 4: the GTP Fellows' contribution to the geothermal area / subject

Type of contribution	Percentage of GTP respondents
Training and mentoring of others	77%
Further research	75%
Contribution to the international debate	34%
Introduction to initiatives /projects	57%
Implementation of projects	63%
Leading projects	58%
Introducing new policies or procedures in my institution	24%
Advising private entities or institutions	27%
Advising policymakers or high-level decision-makers	30%
Advising local communities	28%
Contributing to changes in policies at the regional level	17%
Contributing to changes in policies at the national level	21%
Contributing to changes in policies at the international level	7%

Source: Evaluation online survey

Table 4 shows **the most frequent contributions from all GTP fellows were training and mentoring others, conducting further research, and implementing geothermal development projects**. The results also suggest that training in Iceland contributes to former fellows assuming leadership positions as 58% of the GTP respondents reported that they were leading a project in their technical field.

5-month diploma in El Salvador

An analysis of the 5-month diploma in El Salvador is included in the case study (see Annex12).

Short trainings

The short courses are oriented towards the practical application of new understanding and skills. The evaluation team had access to the short course surveys of four courses funded by GRÓ[8]. An analysis of the results reveals that in all courses **the percentage of respondents reporting that they were either very satisfied or satisfied with the training's usefulness and relevance for their work was above 90%.** Additionally, for all four trainings considered, **the percentage of respondents reporting that they were either very satisfied or satisfied with the general content provided was again above 93%.**

The short course in Kenya covers the main aspects of early geothermal development project over a three-week period, while the short courses in El Salvador generally last one week and focus on specific topics. This is because in El Salvador, GTP is involved in the organization of a 5-month intensive diploma programme that serves to provide a general knowledge on geothermal development, so in-depth short courses are more useful. It should be noted that in East Africa, apart from Kenya and Ethiopia, geothermal development is very limited. Therefore, developing courses that cover all the relevant aspects for geothermal development is a way to promote the use of geothermal resources in the region. In El

[8] For 2018 and 2023 in Kenya and for 2022 and 2024 in El Salvador.

Salvador, the main topic of the short course is chosen after consulting the main institutions expected to send trainees **to ensure they are relevant to the needs of the partner organisation**.

A short training cannot match the impact of a more intensive, costly, and longer training. However, direct observation of a short training in El Salvador and interviews with short training participants revealed that one of the main perceived benefits of short trainings was **the continuous exchange with peers and lecturers on technical aspects faced in similar countries and contexts.** This is particularly relevant for short courses since the participants come from the same geographic region (e.g., Latin America or East Africa) where the underground geothermal resources share common characteristics. This is also confirmed by the survey administered by GRÓ at the end of the short course in Kenya held in 2018, where many respondents (41%) reported that the most important learning experience was sharing knowledge of geothermal projects and well techniques in other countries.[9]

Scholarships for postgraduate studies

As reported in the final evaluation report of the scholarship programme, **GTP has offered the highest number of scholarship grants over the longest period among all GRÓ-funded training programmes**.[10]

Since 2018, GTP has supported 27 MSc students (11 females and 16 males) and seven PhD students (3 females and 4 males) for studies at the University of Iceland or Reykjavik University. Of the seven PhD scholars supported, four were from LDCs and three from LMICs. Nine of the MSc students supported were from LDCs and 17 from LMICs.

The MSc programme is held at the University of Iceland and Reykjavík University (at the Iceland School of Energy). GTP has agreements with both universities to recognise the GTP 6-month training programme as equivalent to 30 ECTS coursework of a master's programme. This allows students to reduce their studies by one semester, although they can complete the full 120 ECTS master's programme if beneficial.

In the same period, 29 MSc scholarship recipients (12 females and 17 males) graduated (some of these were awarded a scholarship before 2018), and two students (both males) were awarded a PhD. At the time of this evaluation, another PhD student was very close to finishing his thesis, and another one is progressing well.

Research and knowledge creation

During the period of 2018-2023, a total of 73 final research projects were published on the GRÓ website. **The GTP publication database has grown to become one of the largest open-access databases on geothermal research in the world**.[11] 29 MSc theses and 138 papers presented at GTP workshops and short trainings have been published on the GTP website along with final research reports from the 6-month fellowship. Furthermore, four papers written by the GTP staff were published in the proceedings of the 2020 or 2023 WGC. The evaluation team also identified seven academic journal articles on Google Scholar that were published between 2018 and 2023 by current or previous PhD scholarships funded by GTP.

In general, **research papers and projects serve as a foundation for alumni to take immediate action, share knowledge, and exchange ideas upon their return to their home country and organisation after completing sponsored programmes**.

9 This same question was not included in other GTP surveys for short training.
10 Source: Gollifer, S.E., Harðardóttir, E., Bottomley (2023). An evaluation of GRÓ's master's and doctoral scholarship programme. Final report.
11 Axelsson, G., Haraldsson, I., Ómarsdóttir, M. and Hardardóttir, V. (2023). GRÓ Geothermal Training Programme in Iceland: Geothermal Capacity Building in Developing Countries for 45 years. *Proceedings World Geothermal Congress 2023*, Beijing, China, April 17 – 21, 2023

GTP fellows reported which ways they had disseminated their research and knowledge products linked to the programme post-fellowship in the evaluation survey. The main channels used by 2018-2023 GTP fellows were presentations to colleagues (72%), presentations at GRÓ-organised events (68%), presentations to supervisors (61%), publications on the GRÓ website (48%), and presentations at conferences (34%) as well as conference proceedings (26%).

Networking

Consistent with the findings presented above on the benefits of sharing technical solutions, the online survey reveals that of the respondents who participated in networking activities, the main perceived benefit is **discussing technical solutions**. Other important benefits were, personal matters such as friendships, **boosting motivation** and **developing joint research or projects**.

A main networking event actively promoted by GTP is the WGC. 117 training fellows or alumni fellows were supported to attend the 2020/21 WGC and the 2023 WGC. The GTP utilized funds generated from previous training activities outside GRÓ's primary funding.

The survey results also show that social media has an increasingly important role in facilitating alumni networking forums through email lists, Facebook and Whatsapp.

3.3 OVERALL FACTORS INFLUENCING THE ACHIEVEMENT OR NON-ACHIEVEMENT OF THE EXPECTED RESULTS

The evaluator notes the following key factors influencing the achievement of the programme results:

- The programme emphasises careful targeting of its efforts, particularly in selecting fellows for the postgraduate diploma programme in Iceland. The selection process for fellows involves a thorough review of applications and an interview process.
- An important aspect of the selection process is the observation of short training participants by the GTP staff. The main criterion to select fellows is the potential contribution of applicants to the development of the geothermal sector in their home countries.
- The 6-month training is organised around eight different specialisations with the specific offer of specialisation areas for a programme decided upon by GTP yearly. The development of geothermal projects requires a diverse range of expertise employing a relatively high number of specialisations enables GTP to address the countries' needs for specific expertise.
- The GTP has clearly established processes to obtain feedback from the fellows on the learning outcomes and the delivery of programme modules which provide insight for its annual review of the programme and subsequent adaptations.

The evaluator highlights the following factors influencing non-achievement of the programme results:

- The GTP does not use normal tracer tools to follow alumni career development. Given the limited staff resources GTP has, it is difficult for the GTP to properly correspond with fellows' home organisations to assess their perspective on the effectiveness of the programme.
- The GTP fellows responding to the external evaluation's questionnaire survey indicated that the principal challenges they face in utilising and applying their knowledge are insufficient resources.

4. Programme implementation and adaptive management (Efficiency)

4.1. Programme management arrangements, planning, monitoring and evaluation, oversight, steering, and risk management systems, and the efficient and effective delivery of results

The evaluator judges that **the operational efficiency of the programme is satisfactory**. Delivery of the intended programme results is timely, and financial management of the programme is in accordance with the service agreement and the internal control system set by the hosting institution. Programme monitoring, reporting, and steering mechanisms are of good quality.

Programme management, planning, and implementation systems

For its first 42 years, GTP was operated at Orkustofnun, the National Energy Authority of Iceland. It is now hosted at ÍSOR under a contract with GRÓ. ÍSOR is a research institute focusing on all aspects of geothermal resource exploration and development making it suitable to be a cooperative partner for GTP. Currently, the programme has 3.5 full-time staff, including GTP director, the deputy director, a project manager and a senior advisor. A few ÍSOR staff members are expected to contribute to GTP's activities, but in reality ÍSOR staff contribution has been lower than originally expected. GTP staff was quite small when it was set out in 1979 (hosted by Orkustofnun) with only two staff members. The number of staff was then increased and reached six staff members in the second decade of this century. When this evaluation took place the number of staff was three.. The reduction of staff has caused an increase in the workload of the remaining staff.

Temporary assistants are also recruited on a need basis. For instance, during the summary of 2023, two summer employees were hired as part-time assistants to support the 6-month training programme and the update of GTP's webpage and database.

Annually, the GTP hires 80 lecturers and support staff from Iceland's leading geothermal institutes, universities, engineering companies, or energy companies to meet the needs of the programme and its trainees at any given time. **This pool of expertise constitutes the programme's resource base and is its greatest asset.** A significant part of the lecturers come from ÍSOR.

Since the MFA, through the GRÓ Centre, is the main source of funding for the programme, the yearly action plan of GTP is assessed by the GRÓ Centre to determine the annual amount of financial support provided for the proposed actions.

The GTP interventions operate based on clearly defined processes that are conducive to achieving operational efficiency. There is no strict deadline for application to the 6-month training. Generally, **candidates are chosen from nominations made by companies and institutes**[12], and these nominating institutions, in Africa, Asia, and LAC countries, are largely the same organisations whose employees attend the short trainings. Each year, GTP runs four or five lines of specialisation; therefore, candidates are selected from the pre-established database based on the requested line of specialisation [more details on the selection process are reported below under the risk management and mitigation section]. The database of nominated experts includes the result of interviews conducted by GTP staff for the purpose of selecting fellows. The 6-month training in Iceland lasts every year from late May to November.

The timeline to apply for an MSc or PhD scholarship is well defined. The deadline for application is 30 November every year. This leaves enough time to GTP to award scholarships before the deadlines set by the two partner universities for enrolling in MSc and PhD programmes (1st February). **The scholarships are awarded only to fellows who have completed the 6-month training in Iceland.**

The short training in Kenya has been held every year (except for 2020) in November for a total of three weeks. In the period covered by this evaluation, the short training in El Salvador generally lasts one week and is typically held in September[13], and the 5-month diploma programme in El Salvador takes place between the end of June and the end of November. However, for the period considered by this evaluation, the training activities in El Salvador have not taken place every year, which was mainly due to COVID-19 pandemic: The short training was held in 2018 and 2022, and the 5-month diploma was organised in 2018, 2019, and 2022.

[12] In some cases, staff members of institutes contact GTP directly to request a fellowship. However, they are still required to provide a recommendation and support letter from their institute.

[13] The only exception was the 2024 edition, which lasted two weeks and was held in February.

In addition to GRÓ-funded short courses, GTP also organises other short courses informally named "tailored training" or "customer designed courses". **While in the past they were also paid by beneficiary organisations[14], since 2018 they have been mainly funded by the MFA outside of the GRÓ budget**. "Tailored trainings" are designed to meet the needs of beneficiary institutions and have been organised in collaboration with the United Nations Environment Programme (UNEP), MFA/ICEIDA.

Programme financial management and oversight

The GTP is operated by ÍSOR - a state-owned non-profit geothermal services firm. ÍSOR was founded after the GeoScience Division of Iceland's National Energy Authority, Orkustofnun, became an independent entity in 2003. The company provides a range of activities and services leveraging over seventy years of ongoing expertise in geothermal and general geoscience research and development.

The GTP is subject to ÍSOR's control procedures and internal financial management including annual audits.

The GRÓ Centre and ÍSOR signed a Service Agreement to operate GTP. The first Service Agreement became effective as of 8 February 2021 and covered the period up to the end of 2023. A subsequent agreement extends the relationship for two years in 2024 and 2025. This second service agreement was signed after long negotiations that lasted around six months for all the GRÓ-funded training programmes. It is the opinion of interviewed ÍSOR's management, that this second service agreement better clarifies ÍSOR's role and expectations and gives more flexibility to ÍSOR to allocate ÍSOR staff to deliver results.

The GRÓ Centre annually determines and confirms its financial contribution to the programme late in the year.

Programme monitoring, reporting, oversight, and steering systems

The academic activities of the programme are governed by an 8-member Studies Board.

As per contractual obligation, ÍSOR submits an annual progress report of the GTP to GRÓ. The GRÓ Centre convenes periodic meetings with the programme directors of the four training programmes to address implementation issues and upcoming actions. The programme also responds to the ad hoc requests from the GRÓ Centre to provide information.

The GTP's internal monitoring systems is properly established. Fellows in the 6-month programme complete a survey assessing content, presentation, and usefulness of every lecture in both the 5-6 week introductory and specialised period of the programme. The educational value and the overall organization of field visits are also assessed through surveys. Fellows also assess accommodation, office space, and lifestyle in Iceland through surveys. Finally, fellows assess the quality and availability of supervision received and the facility used during their final projects. The survey has been slightly altered since 2018 with improvements. Surveys are also organized for short trainings and for the 5-month diploma in El Salvador. For both the 6-Month Training Programme in Iceland and the diploma in El Salvador the GTP administers a survey to assess the satisfaction of training participants. These surveys well serve the purposes of GTP since they provide useful information to improve the following editions of the trainings. However, given that different criteria are used for different phases of the training, it is

14 E.g., In Romania and in Portugal courses were organized and funded by the EEA grants, funded by Iceland Lichtenstein and Norway to reduce economic and social disparities and strengthening bilateral cooperation with the EU.

not possible to provide an overall score for the whole training. So, a detailed analysis of how the overall satisfaction of the training was is not possible.[15]

The GTP has no formal career-tracing methodology of alumni fellows, but it still tries to keep track of former fellows in an informal way. As such, GTP was able to provide records for 65 fellows when the evaluation team asked for data about career advancement of former fellows and scholarship recipients. Such records were collected through personal communications between former fellows and GTP staff. Since the geothermal sector is small, this informal system of records for personal progression allows for some career tracking of fellows. The fact that the career records provided per year of awarded fellowship ranged from 1 to 10, indicates that the records collected are largely incomplete (the number of fellowships provided per year is much higher).

Programme risk management and mitigation systems

The GTP aims to minimize risks to the successful, effective, and efficient delivery of programme results through its careful selection of trainees and targeted interventions. The selection of fellows is conducted through a rigorous process. GTP **only accepts nominations for the 6-month training from the head of the geothermal research and utilization institutions and universities in specialized fields that are considered most relevant to promote geothermal development in their countries.** Applications from individuals are not accepted. Requirements are also clearly defined and include holding a university degree in science or engineering or economics for the project management and finance specialization line. Also, the candidate should hold a minimum of one year of practical experience in geothermal fields and should be in a permanent or long-term position at the government owned energy company, research institution, or university. Fellows are selected through site visits and extensive personal interviews. Due to the high costs associated with international travel, it is not feasible to conduct site visits in all requested countries annually. Therefore, personal interviews are conducted in each country for a period of two to three years at a time, or as opportunity allows. To save on travel costs and time of interviewers, interviews are often at the same time as GTP short courses. Remaining interviews are conducted online.

For the short courses and 5-month diploma, training activities in partner countries are operated in strong collaboration with two trusted partner organizations in Kenya and one in El Salvador.

The limited number of programme staff poses significant risks for the operation of the programme. If one staff member quits or another falls ill, the implementation of the programme would be seriously affected.

A main risk to GTP's implementation during 2018-2023 was the impact of the COVID pandemic which caused total disruption for the programme in 2020 when no trainings could be held. **Trainings were not converted to an online modality**. In 2021 the programme managed to resume the 6-month training in Iceland and the short training in Kenya. Online trainings of a 2-day duration were held in 2020, 2021, and 2022

Another reported risk is **visa applications**. Given the long processing time of immigration applications, GTP strives to conclude the selection of fellows by November or December to begin the following June.

[15] For the 6-Month Training, the questionnaire used asks respondents to assess the satisfaction of each individual lecture of Phase 1 (the first 4-5 weeks of introductory lectures) using three criteria (content, presentation and usefulness). For Phase 2, respondents are asked to address different questions for the group work, the field work through various criteria (education value, duration, organization, etc.), and their satisfaction with the specialization module. Respondents are then asked to assess the individual project phase through new criteria (quality of supervision, availability of supervisor, facility and access to data). Other logistical aspects are also assessed, including office space, staying in Iceland, accommodation.

4.2. THE USE OF PROGRAMME FINANCIAL AND HUMAN RESOURCES AND THE EFFICIENT AND EFFECTIVE DELIVERY OF RESULTS (INCLUDING ANALYSIS OF UNIT COSTS AND VALUE FOR MONEY)

The evaluator judges that the **programme financial and human resources are efficiently deployed and cost effective** in terms of the interventions and the results delivered. The variability in terms of the daily cost per beneficiary between the interventions reflects the different intensity of the training and level of direct support provided. The unit costs per intervention provide **value for money**.

Table 5 details GTP's financial data for the 2018-2023 period. The figures show that its total budget has constantly decreased since 2021 due to a lesser contribution from GRÓ in 2022 and 2023. This occurred despite substantial increase in the inflation rate in Iceland.[16] However, GRÓ took over some costs from GTP like housing and travel costs of fellows. In 2022, other funding sources partially compensated for the decrease in transfers from GRÓ. In 2021, transfers from GRÓ increased compared to 2019, but other sources of funding decreased. As a result, the total budget was lower than in 2019. Total operating expenditures follow the same trend as total income.

Table 5: GTP income statements (ISK)

YEAR	2018	2019	2020	2021	2022	2023
Transfers from GRÓ/MFA	245,900,000	269,988,366	n/a	281,482,738	256,948,530	228,485,080
Other revenues	65,717,243	52,472,983	n/a	33,993,749	47,760,273	38,716,163
Total income	311,617,243	322,461,349	n/a	315,476,487	304,708,803	267,201,243
Total oper. expenses	309,583,585	316,612,421	n/a	316,675,546	306,334,647	270,741,947
GRÓ/MFA (% of total income)	79%	84%	n/a	89%	84%	86%

Sources: UNU GTP annual report 2018 and 2019; ÍSOR income statements 2021, 2022 and 2023

The total budget for 2023 was 14% lower than in 2018. One consequence of the reduction in budgeted resources was that the annual short training in El Salvador was not held in 2019 (in El Salvador, training costs have been almost entirely covered by GTP). Also, GTP staff reported a lower quality of logistical support provided to fellows as a result of budget cuts.

Table 5 shows GTP's revenue capacity outside of the GRÓ transfer which consist of resources obtained by partner institutions to fund fellows and contributions to other training costs.

The tables below report actual expenditures in Kenya and in El Salvador for the last three editions of the courses. In Kenya, GRÓ has contributed between 45% and 48% of the total cost, while in El Salvador GRÓ has covered between 81% and 96% of the annual expenditures. In Kenya, short courses have been largely funded by the two partner organisations KenGen and GDC.

Table 6: Actual costs for GRÓ-funded short courses in Kenya

	GRÓ GTP		KENGEN	GDC	TOTAL
Year	(ISK)	(USD)	(USD)	(USD)	(USD)
2023	20,263,670	148,779	100,832	80,684	330,295
2022	22,816,585	160,635	96,152	80,684	337,471
2021	23,738,440	182,071	93,840	96,920	372,831

Data source: statistics provided by GRÓ GTP

[16] The average annual inflation rate of the 2018-2023 period was 5%, calculated using data provided by Statistics Iceland.

Table 7: Actual costs for GRÓ-funded short courses in El Salvador

	GRÓ GTP		LAGEO	TOTAL
Year	(ISK)	(USD)	(USD)	(USD)
2024	24,200,000	177,680	6,625	184,305
2022	9,770,164	68,785	16,420	85,205
2018	12,748,718	109,591	8,561	118,152

Data source: statistics provided by GRÓ GTP

Table 40 shows a cost comparison across GTP's main interventions in 2022. The table distinguishes both costs covered by GTP and costs covered by other contributing organizations. For the 6-month training, these are power companies in Kenya and the Philippines that funded three fellows from Kenya and one fellow from the Philippines, respectively. For short courses, other financiers are KenGen and GDC in Kenya and LaGeo in El Salvador. For the scholarships, the total cost per person in the table below also includes the housing benefits provided by the Government of Iceland (GOI).

Table 8: Costs comparison (ISK) across main GTP training interventions in 2022

INTERVENTION	GRÓ DIRECT ACTUAL COST	TOTAL DIRECT ACTUAL COST	OUTPUTS	GRÓ DIRECT COST PER PERSON	GRÓ COST PER PERSON INC. MANG & OPER. EXPENSES*	GRÓ DIRECT COST PER PERSON PER DAY	TOTAL DIRECT COST PER PERSON	TOTAL DIRECT COST PER PERSON PER DAY
6-month training	87,609,287	106,711,495	23 fellows	3,809,099	6,043,978	21,643	4,639,630	26,362
Scholarships	47,765,310	48,245,310	14 MSc and 7 PhD students	2,797,200	3,013,474	7,664	3,277,200	8,979
Short course in Kenya	22,816,585	46,738,959	43 participants	530,618	724,759	26,531	1,086,953	54,348
Short course in El Salvador	9,770,164	11,991,462	46 participants φ	212,395	290,105	38,617	260,684†	47,397
5-month diploma in El Salvador	28,380,873	28,380,873	27 participants	1,051,143	1,435,732	6,961	1,051,143†	6,961

φ: It also includes the 27 students who attended the diploma programme

† The short course in El Salvador and the diploma programme were held at the same time with the same participants. The local partner's contribution was allocated only to the short course

* As per data provided by GTP, management and operational costs have been allocated in the following way: 53% for the 6-month training course, 16% for scholarships, 23% for short trainings and training abroad (these were then distributed proportionally to the costs of the training abroad). The remaining 8% is estimated to cover other activities.

Sources: LaGeo 5-month diploma report; the GTP monitoring data; the GTP detailed costs for short courses; the GTP annual budget and costs, WB annual average exchange rate; communication with the GTP management

When assessed on a per student and per student/day basis, the 5-month diploma in El Salvador has a very low cost, suggesting high value for money for this intervention. As explained in the GTP case study report, the low cost per person of the 5-month diploma in El Salvador is mainly due to the low number of scholarships provided (10) in relation to the total number of participants, the fact that travel costs are spread over a relatively high number of days, and the low cost of accommodation. The relatively higher cost per person per day of the short training in El Salvador is due to the short course duration of 5.5 days.

The scholarships for MSc and PhD students are less expensive than the 6-month training because GTP does not have to cover the cost of lecturers and other teaching costs, which are directly paid by the two partner universities.

Finally, Table 41 below presents annual reports on cost data for the 6-month training in Iceland. The average total cost per fellow is ISK 4,447,000, 12% lower than that of the 2012-2016 period.[17]

Table 9: Annual direct costs of the 6-month training in Iceland

	2018	2019	2020	2021	2022	2023	Average
Total Number of fellows	24	24	0	25	23	24	24
Fellows funded by GRÓ	20	20	0	25	19	21	21
GRÓ cost (1000 ISK)	86,643	90,921	n/a	112,825	87,609	76,009	90,802
Total cost (1000 ISK)	112,262	113,193	n/a	112,825	106,711	88,536	106,705
GRÓ cost per GRÓ-funded fellow (1000 ISK)	4,332	4,546		4,513	4,611	3,619	4,324
Total cost per fellow (1000 ISK)	4,678	4,716		4,513	4,640	3,689	4,447

Data source: statistics provided by GRÓ GTP

4.3. EFFECTIVENESS OF THE PARTNERSHIP WITH UNESCO IN REGARD THE PROMOTION OF PROGRAMME RESULTS

The evaluator judges that **GTP's partnership with** United Nations Educational, Scientific and Cultural Organization **(UNESCO)** is **still in the earlier phase of development** and thus have a low level of collaboration. Despite positive correspondence, there are no tangible effect of the partnership with UNESCO.

As clearly highlighted in the 2019 UNESCO proposal for the establishment of GRÓ presented to the UNESCO 40th General Conference, **there are programmatic linkages between GTP and UNESCO's Natural Resources Science Sector**, most notably with the UNESCO Earth Science and the Geo Hazard Risk Reduction section and the International Geoscience and Geoparks programme.

However, despite amicable interactions between UNESCO and GTP, actual collaboration has remained very limited.

Additionally, local partners interviewed reported no perceived change in operations since GTP has been operating under the GRÓ Centre as a Category 2 Centre (C2C) under the auspices of UNESCO.

[17] Source: NIRAS, Evaluation of the UNU Programmes in Iceland, 2017.

5. PROSPECTS FOR THE MAINTENANCE/ CONTINUATION OF THE PROGRAMME BENEFITS (SUSTAINABILITY)

5.1. PROSPECTS FOR THE SUSTAINABILITY OF THE PROGRAMME RESULTS AND BENEFITS

The evaluator judges that the **prospects for the sustainability of the programme results and benefits delivered are good**. GTP partner organizations have demonstrated strong ownership of the results. Overall, the home organizations of GTP former fellows appreciate the knowledge acquired and perceive it to support the application of new knowledge. Networking is an important element to empower alumni.

The financial sustainability of GTP interventions depends on continued funding contribution from the GOI. While partners contribute a minor part of the training costs by funding some fellowships for their employees or by contributing to short trainings, programme costs have been mainly covered by the government through the MFA.

However, **the three local partners - KenGen and GDC in Kenya, and LaGeo in El Salvador - have demonstrated clear ownership by contributing to the costs of short trainings and by providing staff to lecture and organise trainings.**

Immediate benefits are evident when evaluating sustainability from the perspective of training participants. Participants gain valuable knowledge and skills while exchanging understandings on how to utilize and geothermal energy resources. Upon returning to their home organizations, fellows are prepared to share their newly acquired knowledge and present the results of the final projects they completed during the training.

The analysis of the evaluation online survey suggests that fellows' training in Iceland is highly appreciated by the management of their home organisations. Indeed, 85% of GTP respondents reported that they agree or strongly agree with the statement "the management of my organisation appreciates and values the skills I gained from the post-graduate training programme". Additionally, 51% of the GTP respondents reported that a key factor in applying their knowledge and skills after graduation was support from their home institution. This figure confirms that for the GTP, support from the home institution has been perceived as a positive element that is conducive to the sustainability of results.

The survey shows that the **GTP respondents believe that they have contributed to their subject area** since 93% agreed or strongly agreed with a statement saying, "I was able to advance my contribution in my field/subject area thanks to the post-graduate training." As reported in Table 4 above, the main types of contributions consisted of training and mentoring others (77% of the GTP respondents), further research (75%), and the implementation of new projects (63%).

The GTP alumni networking is an important means of empowering former fellows. 63% of the survey respondents participated in networking events, where addressing technological solutions was a key perceived benefit for 77% of GTP survey respondents who participated. Other important key benefits were gaining access to job opportunities for 79% of GTP respondents and boosting motivation for 63% of respondents. The GTP has also prioritized supporting the participation of fellows and alumni in the World Geothermal Conference (WGC) to promote networking.

The involvement of alumni in organizing and teaching short courses and the 5-mobnth diploma is a recurring approach that GTP promotes to empower former fellows. Indeed, for 94% of the short training course and diploma events held during the 2018-2023 period, former fellows were involved in teaching or organizing the training events.

The GRÒ Centre aims to capacitate individuals and institutions in their partner countries to contribute to positive changes within these countries. The extent to which fellows remain within their country and region thus is a critical sustainability factor. The survey results indicate that most GTP fellows are still living in the same country after programme completion contributing to changes there. In 2024, **84% of the GTP survey respondents are still residing in the same region** compared to their residency before training programme participation. This indicates a sustained contribution within partner countries.

One key factor in sustained results refers to the technical field/ subject area of fellows. The survey suggests that almost **80% of the GTP fellows are still working in the same technical field/ subject area in 2024** or have worked in that field until retirement. This indicates that most fellows continue to contribute to the same technical area, in which they have been trained in Iceland, which indicates that the training programme is sustainable in that regard.

5.3. FACTORS SUPPORTING OR LIMITING THE SUSTAINABILITY OF THE PROGRAMME RESULTS AND BENEFITS

The evaluator highlights the following key factors supporting the sustainability of the programme results:

- The GTP alumni actively seek to share their knowledge and skills within their home countries and communities to promote change.
- The three main partner organizations of GTP have demonstrated ownership of the local training activities in their home countries, and they are all committed to further utilizing the courses.
- The climate change agenda calls on governments and companies to increase investments in clean energy sources. A higher number of trained geothermal experts will be essential in the future to meet greenhouse reduction and fossil fuel diversification objectives.

The evaluator highlights the following key factors hindering the sustainability of the programme results:

- The sustainability of the programme depends on continued funding provided by the GOI and the MFA. Ultimately, this **funding depends on political decisions**.
- The main challenge GTP alumni face in utilizing and applying their knowledge is linked to insufficient resources of their institution (for 42% of respondents). Other perceived barriers are insufficient support by the home institution (for 27% of respondents) and limited scope and responsibilities (for 24% of respondents).

6. PROSPECTS FOR LONGER-TERM DEVELOPMENT EFFECTS (IMPACT)

6.1. THE DIRECT EFFECTS AND LONGER-TERM PROSPECTS FOR IMPACT OF THE PROGRAMME ON THE MICRO, MESO, AND MACRO LEVELS

The evaluator judges that the **prospects for longer-term development effects of the programme are good**. The GTP former fellows indicate that projects or reform initiatives have contributed to advancing progress on the SDGs. **2018-2023 GTP alumni indicate contributions mainly related to SDG 7 and 13. There are impacts are at the individual (micro), meso, and macro levels with impacts at the individual level being strongest**.

The GRÓ's expected impact as defined in its ToC is, "Through capable individuals and organisations, partner countries progress towards the achievement of the targeted SDGs by promoting the sustainable use of natural resources; strengthening resilient natural and human systems; advancing equality and human rights; and improving human wellbeing".

The online survey results show that 63% of the 2018-2023 GTP fellows have contributed to projects that are related to the SDG achievement. Among these, **90% of GTP respondents have contributed to projects/ programmes/ policies initiatives that address SDG 7**, "Affordable, reliable and sustainable modern energy for all," and **39% to SDG 13,** "Take urgent action to combat climate change and its impact." The top five SDGs that the alumni respondents indicate their contribution toward are reported below in Table 10. GTP fellows have made contributions through efforts in geothermal energy development, policy advocacy, and community engagement directly supporting SDG 7 by promoting affordable and clean energy solutions. By implementing climate mitigation and adaptation projects, conducting research, and participating in environmental conservation campaigns, they contribute to SDG 13 by addressing climate change and promoting sustainability.

Table 10: SDGs that the 2018-2023 GTP online respondents have contributed to advancing progress on

SDG 7	SDG 13	SDG 5	SDG 9	SDG 17
90%	39%	27%	20%	16%

Source : Evaluation team's own alumni survey

On the micro-level, the direct beneficiaries of GTP training interventions have acquired the knowledge and skills needed for geothermal resources utilisation. This has the potential to inform their decisions on the development of new geothermal projects and the improvements of existing ones. Indeed, the evaluation online survey revealed that further research (75% of the GTP respondents) was frequently reported as the fellow's contribution, followed by the implementation of projects/initiatives (63% of respondents), and the introduction of initiatives or projects (57% of the GTP respondents).

Impacts at the meso and macro levels less clear and more difficult to measures and assess. Interviews conducted with former participants of the 6-month trainings, the 5-month diploma in El Salvador, and short courses showed **various instances of changes introduced in organisations by GTP learners because of the knowledge and skills acquired during the trainings**. Some examples are reported in the case study for El Salvador. The results of the online survey show that 24% of the GTP respondents reported having introduced new policies or procedures in the institutions where they work.

At the macro level, 88% of the GTP fellows (strongly) agree that the programme was relevant for their country's needs. Moreover, **30% of the GTP respondents to the online survey reported that they have contributed input to policy makers or high-level decision makers,** 17% have reported contributing to changes in regional policies, 21% have contributed to changes at the national level, and 7% for the international policy framework. In addition to that, many GTP fellows hold high level positions within their country, allowing them to make impactful contributions at that level (e.g. Senior Exploration Geologist at the Geological Survey of Papua New Guinea).

Overall, the prospects for long-term development effects of GTP are good. Some impacts at the organisational and policy level evident, but the results of the survey suggest that prospects for impacts seem to be higher at the micro-level by improving knowledge, skills, and careers of individual learners.

6.2. FACTORS SUPPORTING OR HINDERING PROGRESS IN THE LONGER-TERM ACHIEVEMENT OF DIRECT EFFECTS AND IMPACT

The evaluator highlights the following key factors supporting the impact of the programme results:

- **The two partner organizations in Kenya and the partner organization in El Salvador are established companies that have a long-term objective to position themselves as reputable organizations** with strong expertise in geothermal energy and a commitment towards advancing the utilization of geothermal energy in the region.
- The climate change crisis will require more countries to devote more investments to alternative energy sources. More expertise is needed to further explore and exploit geothermal energy.

The evaluator highlights the following key factors limiting the impact of the programme results:

- Interviewed key experts indicated the regulatory framework of countries where trainees come from is often a constraint for the utilization of geothermal energy in different countries.
- **The exploration of geothermal energy is a high-risk endeavour for investors**. The availability of grants and concessional credit will be crucial for continued exploration.

7. HORIZONTAL THEMES/ CROSS-CUTTING ISSUES

7.1. CONTRIBUTION TO GENDER EQUALITY

The GTP promotes gender equality in many ways. **First, it has a "gender-based candidate selection policy**." GTP encourages home organisations to nominate female candidates for training activities. As reported in a paper written by GTP staff[18] and presented at the 2023 WGC, GTP **offers women in the geothermal sector a rare opportunity to advance their careers since training chances are unfortunately more often given to their male colleagues**.

However, **given that men are overrepresented in the geothermal sector, the percentage of women participating in all GTP training activities is higher than that of the actual professional landscape**. From 2018 to 2023, women accounted for 41% to 43% of the MSc and scholarship recipients, 42% of the fellows in the 6-month training in Iceland, 43% of the 5-month diploma in El Salvador, and 36% the short course participants. It should be noted that in 2024 the 6-month training programme enrolled 14 women out of 26 participants, thus reaching gender equality.

The GTP also promotes the recruitment of female teachers for training activities. **The fact that women lecture on topics that are typically male dominated, such as drilling, can be inspiring for women and promote greater acceptance of women in the field among men.**

For the 14th consecutive year, Iceland has taken the top position as the most gender-equal country according to the Global Gender Gap Index.[19] **A 6-month experience in this sort of social environment can promote the acceptance and normalization of women in the workplace among fellows from cultures where it is not common**. The GTP staff report also emphasises the empowering effects of the experience for women who come from countries with restrictive cultural views on gender. The authors highlight numerous cases of women who join the programme feeling timid and reserved at first but over time develop the confidence to use the space to **develop skills to effectively tackle adversity and challenges**. This makes the opportunity of the programme a transformative and empowering experience for many women.

7.2. CONTRIBUTION TO HUMAN RIGHTS

Human rights are not directly relevant to GTP and are therefore not addressed in trainings. However, being exposed to life experiences in Iceland can contribute to a new understanding of human rights. The aforementioned paper mentions a case that illustrates this point. A 6-month fellow discovered the existence of women's shelters while staying in Iceland. These shelters provide refuge for women who need to escape from abusive homes. In her own country, abuse and violence against women are unfortunately common, and she had never heard of such shelters before. Taking advantage of her opportunity to study geothermal energy, she visited the shelters and conducted interviews with the staff members, hoping to gather information on how to establish a similar shelter in her own region. Upon her return, she contacted the ministry in the capital city and advocated for the establishment of a women's shelter in her region, where female abuse is prevalent.

[18] Ómarsdóttir, M., Axelsson, G., Haraldsson, G. I., and Hardardóttir, V. (2023). Successes and challenges of Geothermal Training: Behind the scenes insight into the UNU/GRÓ Geothermal Training Programme. Proceedings of the World Geothermal Congress 2023. Beijing, China, April 17 – 21, 2023.

[19] Source: World Economic Forum (2023). Global Gender Gap report.

7.3. CONTRIBUTION TO ENVIRONMENTAL SUSTAINABILITY

The environmental risks of geothermal development projects are addressed in GTP trainings, and **environmental science is one of the eight areas of specialisation in the 6-month training.** Environmental and social management of geothermal projects is covered in 11 modules of the 5-month diploma. Environmental aspects and risks of geothermal development were also included in the 2017, 2022, and 2024 editions of the short courses in El Salvador. Additionally, environmental, social, and regulatory issues and tools for addressing them were incorporated into all editions of the short courses in Kenya.

The utilisation of geothermal energy can serve as a substitute for electricity and heat generation from fossil fuels. Therefore, **any development in geothermal energy exploitation to which GTP contributes has the potential to reduce greenhouse gas emissions**.

Additionally, GTP fellows are required to practice recycling both at the GTP office and in their provided accommodation. For some of them, this is their first exposure to recycling practices, which also provides valuable environmental education.

7.4. MANAGING AND COUNTERING THE EFFECTS OF EXTERNAL SHOCKS AND RISKS TO THE PROGRAMME

The principal external shock to the programme's implementation during 2018-2023 was the impact of the **COVID pandemic**. All planned GTP training activities were cancelled in 2020 and were not substituted with online training. Training activities were resumed in 2021 with the 6-month fellowship and the short training in Kenya.

CONCLUSIONS

The extent that the training programme interventions have met their intended results

The GTP's mission to facilitate access to and promote the sustainable utilisation of geothermal resources aligns perfectly with the priorities of Iceland's Policy for International Development Cooperation 2019-2023. Additionally, GTP's alignment with Iceland's commitment to the SDGs, particularly SDG 7 (affordable and clean energy), demonstrates a coherent integration with Iceland's national development vision, strategies, and international commitments.

The GTP interventions are well-aligned with the needs and priorities of the partner countries and target groups. The strong demand for the fellowship training programme indicates its relevance and alignment with local priorities, particularly regarding electricity generation from geothermal resources. Many partner countries, including El Salvador, Kenya, and Ethiopia, have national strategies that prioritise the reduction of greenhouse gases by exploiting geothermal resources. Additionally, the GTP training activities are placing emphasis on low enthalpy resources and direct heat utilization, which are expected to play an increasingly important role in local economic development.

The programme is effective in targeting individuals who can significantly impact geothermal development in their respective countries as results show the majority of GTP fellows work in public institutions, public sector enterprises, and academia.

The programme offers a coherent mix of training interventions, targeting young professionals with tailored training offers of different levels of depth. The core intervention is the 6-month training programme fellowship in Iceland which allows a high degree of specialisations for fellows. The 5-month diploma in El Salvador has a similar intensity to the 6-month fellowship programme but offers very limited specialisation opportunities. This comprehensive approach to training limits the depth of expertise that participants can achieve in specific areas but can focus on regionally relevant issues for El Salvador such as using volcanic geothermal resources.

The evaluator assesses that GTP has successfully delivered the intended capacity development results. **During the period 2018-2023, the principal training outputs delivered by the programme include 120 fellows graduated via the 6-month fellowship programme in Iceland, 86 persons trained via the regional 5-month diploma in El Salvador, 27 former fellows supported for MSc**

degree, 7 for doctoral research studies, 422 direct beneficiaries trained through short courses, and 396 learners enrolled in GTP online offer.

Regarding the 6-month training in Iceland, the average number of fellows graduated from the 6-month training in Iceland per year was 24 excluding 2020 when no training took place due to COVID-19. The fellows came from 28 countries. 78% of fellows came from LDCs or LMICs, and 41% of the fellows came from countries in Sub-Saharan Africa. The key partner country from which 2018-2023 GTP fellows came is Kenya (23%). **Overall, the quality of the individual training sessions is highly rated by the fellows**. Each graduating fellow completed a research paper/project **which form a basis for further immediate action and knowledge sharing exchange by the alumni upon return to their home country.**

In response to the external evaluation team's online questionnaire survey of GRÓ alumni, **89% of the 2018-2023 GTP fellows (strongly) agree with the statement saying that they were able to advance their contribution in their field/subject** area thanks to the postgraduate training programme. Additionally, **68% of 2018-2023 GTP respondents indicated they had advanced professionally** in their career due to their enhanced skills. The online survey results show that **63% of the 2018-2023 GTP fellows have contributed to projects that are related to the SDG achievement**. Among these, 90% of GTP respondents have contributed to projects/programmes/policies initiatives that addressed SDG 7, "Affordable, reliable and sustainable modern energy for all," and 39% to SDG 13, "Take urgent action to combat climate change and its impact."

The programme has supported 7 doctoral scholars (3 females and 4 males) by providing scholarships for doctoral studies. Four scholars come from LDCs and 3 come from LMICs. Two Kenyan students have earned a PhD degree, and another scholar from Tanzania is close to finishing his. From 2018 to 2023, GTP initiated supported for 27 MSc students (11 females and 16 males) and saw 29 in total graduate (12 females and 17 males) including those who were granted a scholarship just before the 2018 evaluation period. 9 of the supported MSc students were from LDCs and 17 were from LMICs. The effectiveness of the interventions aligns with the standard expectation of such scholarship grants. In the 2018-2023 period, the PhD-supported scholars have produced 7 papers published in academic journals demonstrating the creation of significant research outputs by scholars.

Through the short courses, the programme delivered training to 422 local experts working in a wide range of institutions including public companies and government institutions. All GRÓ-funded short courses were held in Kenya or El Salvador. Short trainings in Kenya are introductory trainings covering all main aspects of geothermal energy while short trainings in El Salvador are shorter than those in Kenya but tend to focus in-depth on specific topics. **More than 90% of short course participants were either satisfied or highly satisfied with the relevance and usefulness of the training.**

The offer of online courses was relatively limited, with only four online courses organized, each lasting for 2 days. However, participation was very high, as 396 individuals enrolled in the courses (172 female and 269 male). GTP staff plans to increase the offer of online training activities, however, continuous budget cuts and limited human resources have represented a main constraint.

The GTP has actively contributed to enabling three local partner organizations to design and implement trainings. Two of these organizations are based in Kenya and one in El Salvador. These organisations direct benefit by becoming regional experts in geothermal energy through participating in the training programmes, positioning themselves as regional experts in geothermal energy**. They have shown a clear commitment to improving professional capacities to develop geothermal projects in their respective regions. The two organizations in Kenya have also significantly contributed to the cost of the short trainings, and one has regularly funded fellows for the 6-month training in Iceland.**

The GTP alumni network is also an important means to empower alumni and build a community of geothermal experts, especially for addressing technological solutions as reported by alumni. Participation in the WGC has been key in facilitating networking. The empowerment of alumni is also actively promoted by involving former fellows in teaching and organizing training events, such as short courses of the 5-month diploma in El Salvador.

The primary successes of the training programme and the benefits generated

The GTP has strongly contributed to creating a pool of geothermal experts in LDCs and LMICs with the most significant geothermal potential.

The fellowship programme is strongly in demand. **The selection of fellows is based on a rigorous review of nominated practitioners and an interview process. As part of the selection process, considerable attention is given to ensuring that the chosen fellows are in positions that enable them to make an impact on the utilization of geothermal resources in their countries. In order to ensure the selection of fellows with significant learning potential, GTP often uses short courses to observe experts nominated for the fellowships**.

The results of the online survey indicate that the perceived quality and coherence of the training was very high. The same survey also indicates that the 6-month training programme has strongly contributed to fellows' skill development with the highest degree of reported improvement in the areas of technical skills, research, and analytical skills. While all training components were highly appreciated, individual research projects and fieldwork were deemed to be the most valuable training modules. **Fellows go back to their countries empowered to drive change in their area of specialization.** Additionally, fellows consider **completing the 6-month training beneficial for career advancement**. The most frequent forms of career advancement are taking on more responsibilities and receiving job promotions. GTP has also trained 86 experts through the regional 5-month diploma during the 2018-2023 period. **The regional 5-month diploma is a very cost-efficient training intervention that has contributed to growing the pool of geothermal experts in an area with high geothermal potential from volcanic origin**.

Regarding short trainings, the end-of-course survey reports detail very high satisfaction with the usefulness and relevance of the training for the participants' work. The main training topics for the short trainings in El Salvador are chosen based on the institutions expected to send trainees to best align to their needs. In Kenya, where GTP does not organize an intensive 5-month training like in El Salvador, the three-week training is an introductory course touching on the main aspects of early geothermal development. In this way, **GTP makes sure that short courses are tailored to the needs of the country context and partner organizations.**

Short trainings also represent an important opportunity for networking. GTP actively promotes alumni networking in different ways especially by supporting the participation of fellows the WGC. One main benefit of alumni networking is exchange on technological solutions with peers and colleagues who have faced similar problems.

The GTP's commitment to promoting gender equality is evident through its proactive policies and initiatives. By implementing a "gender-based candidate selection policy," GTP actively encourages the nomination of female candidates for training activities, providing women in the geothermal sector with essential opportunities to advance their careers. Gender equality has not been achieved in GTP trainings in the 2018-2023 period. It was achieved in 2024 for the 6-month training, but it will be difficult to maintain it due to the overrepresentation of men in the geothermal industry. Additionally, GTP's emphasis on recruiting female teachers serves as an inspiring model for gender inclusivity to the fellows. **GTP training has a profound gender-transformative impact in providing women from culturally restrictive backgrounds the chance to access professional training in an inclusive environment**. These experiences not only empower women to gain confidence in an assertive environment but also equip them with the skills necessary to overcome challenges in their professional and personal lives.

The primary constraints for results achievement by the training programme

The primary constraints for achieving results in the programme's capacity development efforts are external risks largely beyond the direct or even intermediate control of the programme.

The coherence of GTP with other development efforts by Iceland in partner countries or regions is limited. The programme's activities and the distribution of fellows indicate a focus on countries with significant geothermal development potential rather than those with bilateral cooperation agreements with Iceland **which is rational given the programme's objectives of geothermal development**.

Past synergies, such as those with the MFA-ICEDA funded projects in East Africa, demonstrate the potential for greater coherence. However, recently the MFA has paid less attention to promoting the utilization on geothermal resources in East Africa. **Where possible, future initiatives could benefit from reinvigorating these synergies to enhance the coherence and impact of Iceland's development efforts**.

The respondents to the evaluation team's questionnaire survey indicate that **the principal challenges they face in utilizing and applying their knowledge are insufficient resources within their home institution.** Another risk was the complicated procedures required to grant an immigration visa which delayed the arrival of some fellows.

The programme seeks to mitigate these risks through a rigorous selection of nominated candidates for the 6-month training and by including support from their home organization. In order to reduce risks related to immigration procedures, GTP selects experts well in advance of the beginning of the annual programme.

The suitability of the programme institutional arrangements to generate the programme results

The evaluation of GTP reveals a comprehensive and efficient operation that has successfully adapted to changing circumstances and maintained high standards of training and financial management.

The GTP demonstrates satisfactory operational efficiency, delivering intended programme results in a timely manner and maintaining high standards in both quantity and quality of services. The financial management adheres to the service agreement and internal control systems established by the hosting institution, ÍSOR. **The programme benefits from robust planning and monitoring systems, ensuring effective delivery of results and incorporating feedback from previous editions of the trainings**.

The programme's management and implementation systems are well-structured and effective. Initially operated at Orkustofnun, GTP has successfully transitioned to ÍSOR. Despite a reduction in full-time staff, the programme has effectively leveraged temporary assistants and support from ÍSOR staff to meet its operational needs. The pool of expertise drawn from leading geothermal institutes, universities, engineering companies, and energy companies constitutes a significant and essential asset for the delivery of the programme.

The financial management of GTP is robust and benefits from ÍSOR's control procedures and internal financial management systems. Annual audits and a service agreement with the GRÓ Centre provide additional oversight.

Available resources have been diminishing over time. As a result, the average cost per fellow of the 6-month training in Iceland is 12% lower than the cost per fellow of the 2012-2016 period. **Despite a reduction in budgeted resources, particularly from GRÓ transfers, the programme has managed to sustain its operations and adapt its activities accordingly**.

All of the GTP's training activities are well-organized and responsive to the needs of the geothermal sector. The selection process for fellows is rigorous, ensuring that only highly qualified and relevant candidates are chosen.

The programme's financial and human resources are efficiently deployed and offer high value for money. The variability in daily costs per beneficiary reflects the different intensities of training and support provided. The six-month training programme in Iceland, scholarships for MSc and PhD students, and short courses in Kenya and El Salvador are all managed cost-effectively, **while the five-month diploma in El Salvador is most cost-effective.**

The sustainability of the training programmes in El Salvador and Kenya depends on the continued partnership with local companies and the ongoing provision of funds from GTP. There are indications of financial commitments from partner companies. In Kenya, the two companies assume important portions of the short training costs while in El Salvador the financial contribution from the local partner LaGeo has been less. However, the evaluative case study for El Salvador shows that there has been a significant in-kind contribution through the provision of lecturers and facilities. Additionally, in 2018,

LaGeo's financial contribution has been exceptionally high, and discussions are ongoing to fund the diploma course independently. More specifically, for the new 5-month diploma edition in El Salvador, GTP is expected to significantly reduce its contribution, while still playing a role to ensure the quality of the training.

Overall evaluation conclusion on the performance of the GTP

The evaluator judges that **the overall performance of the GTP is satisfactory** (good).

Table 11: Evaluation performance rating

EVALUATION CRITERION	PERFORMANCE RATING
Relevance	Highly satisfactory
Coherence	Adequate
Effectiveness	Satisfactory
Efficiency	Satisfactory
Sustainability	Satisfactory
Impact	Satisfactory

LESSONS LEARNED

Lessons 1

Two crucial aspects need to be considered for a training programme to have an impact on the utilization of geothermal resources in a certain country. The first one is the potential of the trainee's home organization to the utilize geothermal resources and promote their usage in the home country, and the second one is the current or future position that the trainee will hold within the home organization.

An organization's potential contribution to the utilization of geothermal resources can be assessed rather easily. However, evaluating a candidate's potential to influence an organization is a much more complicated task that requires analysing the candidate's personal potential while also considering their home organization's ability to empower fellows through its organizational structure and procedures.

Insights from GTP show that a careful assessment of both aspects is essential for training institutions.

Lesson 2

The partnership with UNESCO has not brought any tangible effects since its beginning. One expected benefit from UNESCO through the partnership was the added credibility from its brand reputation. However, the country of Iceland has a strong reputation concerning technical knowledge of geothermal resources. Key informants interviewed in El Salvador stated the Icelandic origin of any GTP expert lecturing on geothermal energy signals competence and credibility. This "country of origin" reputation effect holds more brand value than an international organisation brand such as UNESCO.

Lesson 3

The GTPs in El Salvador and Kenya demonstrate that repeating the training over several years with the same partner organisation is a viable way to expand training in partner countries. The success of these programmes relies on the active involvement of well-established state-owned geothermal companies. These three involved companies have an extensive history in geothermal utilization and a strategic goal of contributing to the growth of the geothermal sector in the region. Building the necessary skills for geothermal development requires specific professional expertise. To replicate the training supported by GTP in El Salvador and Kenya in other countries, it will be crucial to identify partner organisations that have strong expertise in geothermal development, share the same commitment as LaGeo, KenGen, and GDC to advancing the geothermal community, and have a long-term vision of promoting the use of geothermal resources.

RECOMMENDATIONS

1. The focus of the programme's activities and the distribution of fellows is on countries with significant geothermal development potential, rather than those with bilateral cooperation agreements with Iceland. As a result, the coherence of the GTP with other development efforts by Iceland in partner countries or regions is limited. In future initiatives, **GTP should establish synergies with other development interventions funded by the GOI to enhance the coherence and impact of Iceland's development efforts**. However, attention should be paid to avoid that offering geothermal training in countries that have no viable resources or plans to develop geothermal resources.
2. The GTP's offering for online training has been limited. This is a missed opportunity to expand the pool of experts in the geothermal field at a relatively low cost. **GTP should consider investing greater efforts to improve the online offer.** This additional activity would probably require additional financial resources.
3. The evaluative case study on the 5-month diploma in El Salvador has shown that this specific training intervention is very cost-effective for enlarging the pool of geothermal experts in the region. However, the recent graduation of El Salvador from LMCI to an UMIC poses a challenge for aligning future GRÓ-funded activities with the objective of focusing on LMICs. **GTP and LaGeo should pay special attention to ensure that a larger portion of trainees are from LMICs**. In addition, the general nature of the offered curriculum in the 5-month diploma limits specialisations needed for work in the geothermal sector. If offering many different specialisation fields (as done for the 6-month training in Iceland) is not an option due to costs and logistical considerations, a **possible alternative for GTP and LaGeo could be to offer two broad specialisation areas: one for the earth sciences (including geothermal geology, geochemistry, and geophysics) and another for plant development and drilling**.
4. The GTP has tracked part of the alumni in an informal way, but it has not a used a formal tracing method to keep track of the career advancement of alumni. This is a missed opportunity to properly assess the impact of the training programme once fellow return to their countries. However, with the limited number of available staff it will be hard for GTP to properly implement a regular survey. **GRÓ should consider the implementation of a tracer survey for all supported training programmes**.

POTENTIAL OPTIONS TO GUIDE FUTURE ENDEAVOURS OF THE PROGRAMME

Currently, GTP has no synergies with other development interventions funded by Icelandic international cooperation. Previous collaborations, such as those with the MFA-ICEDA funded projects in East Africa, demonstrate the potential for more partnerships. The MFA could explore possibilities to engage GTP in development interventions in future projects to improve the coherence and effectiveness of Iceland's development initiatives.

The establishment of geothermal training centres in partner countries is an opportunity to be further explored. These should not only be limited to the provision of short trainings but also to longer and more intensive training. The 5-month regional diploma in El Salvador represents an excellent example that could be replicated in East Africa with potential financial contribution from other donors and partner companies. Data provided show that such an option may be particularly cost-effective. However, any long-term training outside of Iceland would not have the same transformative potential on gender aspects that a 6-month living experience has in Iceland.

SWOT ANALYSIS - GTP

STRENGTHS	WEAKNESSES
• GTP is a well-known training institution in the field of geothermal energy that has effectively contributed to augmenting the number of geothermal experts in LDCs and LMICs • There are significant positive impacts of GTP in advancing the skills of fellows, contributing to further research, and advancing career opportunities for fellows. • GTP has been able to actively engage three key companies as long-term partners	• Limited alignment of GTP with other development efforts funded by the GOI • Limited offer of online training • Reduced number of permanent GTP core staff
OPPORTUNITIES	**THREATS**
• The international development cooperation projects that the Icelandic MFA funds on geothermal resources exploration and exploitation offer considerable opportunities to involve GTP in capacity-building for those projects, thus improving the alignment of GTP with Icelandic international development cooperation. • The KenGen training centre was selected as the TVET reference training centre for energy aspects of a regional World Bank investment (approximately 70% of the World Bank grant investment is for infrastructure upgrade, while a large part of the remaining part is aimed at funding the pedagogical and training skills of KenGen experts). There are opportunities to replicate the organization of an intensive regional diploma of long duration as done in El Salvador to establish a permanent training centre focused on geothermal energy. • In the past, LaGeo has demonstrated the capacity to assume a substantial part of the training cost and discussions are ongoing to fund the diploma independently from GTP.	• Any training activity implemented outside of Iceland will not have the same transformative potential on gender aspects that Iceland provides. • Continuous cuts to the GTP budget may undermine GTP's training capacity.

GRÓ TRAINING PROGRAMME RESULTS DELIVERY & ACHIEVEMENT – GRÓ GTP

PERFORMANCE INDICATOR	SPECIFIC INDICATORS	2017	2018	2019	2020	2021	2022	2023	SUMMARY
Outcome: GRÓ fellows, trainees and respective organisations promote and implement changes needed to achieve SDGs relevant to their field of work									
P1. Management in partner organisations assess the training to be valuable for the organisation	% of alumni survey respondents who agree (4 out of 5 on the scale) or strongly agree (5 out of 5 on the scale) that their organisation's management values and appreciates their skills from the postgraduate training (3 years after graduation)	92.9%	68.8%	78.3%	N/A	100%	87.0%*	91.7%*	85.7% (2018-2023 cohort) (GOPA 2024 alumni survey data)
P2. Graduates have used the training to advance their contribution in their field/sector of work	% of alumni survey respondents (fellows) who agree (4 out of 5 on the scale) or strongly agree (5 out of 5 on the scale) that they advanced their contribution in their field/sector due to the postgraduate programme (3 years after graduation)	92.9%	81.3%	91.3%	N/A	94.7%	91.3%*	83.3%*	91.4% (2018-2023 cohort) (GOPA 2024 alumni survey data)

PERFORMANCE INDICATOR	SPECIFIC INDICATORS	2017	2018	2019	2020	2021	2022	2023	SUMMARY
P3. Graduates have used their training to share with colleagues and other experts in their respective field of expertise	% of alumni survey respondents (fellows) who report sharing their training knowledge with supervisors, colleagues and/or expert networks (3 years after graduation)	78.6%	88.9%	76.0%	N/A	83.3%	69.2%*	84.0%*	79.7% (2018-2023 cohort) (GOPA 2024 alumni survey data)
P4. Graduates have advanced professionally (e.g. promotion or received scholarship for further studies)	% of alumni survey respondents (fellows) who report substantial (4 out of 5 on the scale) or extreme (5 out of 5 on the scale) career advancement due to the training (3 years after graduation)	71.4%	68.8%	65.2%	N/A	80.0%	56.5%*	70.8%*	67.9% (2018-2023 cohort) (GOPA 2024 alumni survey data)
**The GRÓ Results Framework suggest measuring outcome level results 3 years after programme graduation. Therefore, the indicator value for the graduation year 2022 and 2023 should be interpreted with caution. Generally, the survey findings suggest that it might take some time for outcome level results to materialise after programme completion. Therefore, the measurement 3 years after programme completion seems reasonable.*									
Output N°1: Increased capability of individuals and expertise of GRÓ partner organisations to design and implement programme activities in respective professional fields									
P1. Number of experts trained in the GRÓ 5-6- month training programmes	Annual # of fellows Gender ratio M/F (%) Country Income level LDC and LMI (%)	23 8 F (35%) 15 M (65%) 35% LDC 57% LMIC	24 9 F (38%) 15 M (63%) 25% LDC 54% LMIC	24 11 F (46%) 13 M (54%) 21% LDC 54% LMIC	0 (COVID)	25 12 F (48%) 13 M (52%) 20% LDC 68% LMIC	23 9 F (39%) 14 M (61%) 4% LDC 65% LMIC	24 9 F (38%) 15 M (63%) 17% LDC 71% LMIC	143 58 F (41%) 85 M (59%) 29 LDC (20%) 88 LMIC (62%)

PERFORMANCE INDICATOR	SPECIFIC INDICATORS	2017	2018	2019	2020	2021	2022	2023	SUMMARY
P2. Quality of the 5-6 month training	Self-assessment survey of fellows at the start and end of training on knowledge, skills and mindset (on a scale from 1 low – 5 high)	Data not available	Data not available	Data not available, no formal survey conducted	Not applicable	Data not available	Data not available	Data not available	A survey is conducted based on different criteria and questions for different topics and phases, which makes it impossible to determine a single score
P3. Number of graduates eligible for 30 ECTS credits / Diploma degree at completion of 5-6 month training. Only applicable GEST & LRT fellows	Annual # of diploma certificates issued Graduation ratio (% of total cohort of fellows eligible)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	The GTP postgraduate fellowship is not eligible for ECTS credits
P4. Number of short courses (5-7 days) in partner countries	Annual # of weeks of on-site training # of participants in short courses Gender ratio M/F (%)	*SDG Africa* = 3 weeks 63 people (35% F) *SDG LAC* = 1 week 66 people (48% F)	*SDG Africa* = 3 weeks 32 people (34% F) *SDG LAC* = 1 week 76 people (38% F)	*SDG Africa* = 3 weeks 38 people (39% F)	0 (COVID)	*SDG Africa* = 3 weeks 50 people (36% F)	*SDG Africa* = 3 weeks 43 people (35% F) *SDG LAC* = 1 week 46 people (43% F)	*SDG Africa* = 3 weeks 43 people (37% F)	*SDG Africa* = 18 weeks 269 people, 97 F (36%) *SDG LAC* = 3 weeks 188 people, 81 F (43%)

PERFORMANCE INDICATOR	SPECIFIC INDICATORS	2017	2018	2019	2020	2021	2022	2023	SUMMARY
		Customer-designed courses = 0.6 weeks 16 people (25% F)	*Customer-designed courses* = 0.5 weeks 54 people (30% F) *LAC Diploma* = 30 people	*Customer-designed courses* = 1.3 weeks 22 people (9% F) *LAC Diploma* = 29 people			*Customer-designed courses* = 0.2 weeks 19 people (32% F) *LAC Diploma* = 27 people		*Customer-designed courses* = 2.6 weeks, 111 people, 28 F (25% F) *LAC 5-month diploma* = 86 people, 25 F (29%)
P5. Quality of short course training	% of participants assess the course to be useful for enhancing skills & knowledge (relevant and helpful for my job) (on scale from 1 – 5)	SDG Africa = 4.6/5 SDG LAC = 4.42/5	SDG Africa = data not available SDG LAC = 4.46/5	SDG Africa = data not available	Not applicable	SDG Africa = data not available	SDG Africa = data not available SDG LAC 95% respondents	SDG Africa = 98%	Survey results for 2018 Africa have not been made available. The 2019 and 2023 surveys did not include questions on usefulness. In 2021 and 2022 no survey was done for course in Africa. The 2022 survey LAC and 2023

PERFORMANCE INDICATOR	SPECIFIC INDICATORS	2017	2018	2019	2020	2021	2022	2023	SUMMARY
									Africa is not on a 1-5 scale
P6. Number of live streaming training courses	Annual # # of participants	0	0	0	1 course 46 people (26% F)	1 course 64 people (14% F)	2 courses 286 people (37% F)	0	4 courses 396 people 127 F (32%)
P7. Quality live streaming training courses	% of participants assess the course to be useful for enhancing skills & knowledge (relevant and helpful for my job) (on scale from 1 – 5)	Not applicable	Not applicable	Not applicable	97% 4.63/5	Data not available	94%	Not applicable	2021 survey did not include a question on usefulness of course. Perc. figures refer to the quantity of persons that scored at least 3 on a scale from 1 to 5.
P8. Number of online courses and number of participants in the online courses	Annual # # of participants newly enrolled	0	0	0	0	0	0	0	No online courses offered
P9. Quality of online training	% of participants assess the course to be useful for enhancing skills & knowledge (on scale from 1 – 5)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable

PERFORMANCE INDICATOR	SPECIFIC INDICATORS	2017	2018	2019	2020	2021	2022	2023	SUMMARY
P10. Number of GRÓ graduate studies scholarships provided annually	Annual # Master's and PhD Gender ratio M/F (%)	M.Sc. = 5 3 F (60%) 2 M (40%) PhD = 1 1 M (100%)	M.Sc. = 5 2 F (40%) 3 M (60%) PhD = 1 1 M (100%)	M.Sc. = 5 2 F (40%) 3 M (60%) PhD = 1 1 M (100%)	M.Sc. = 5 2 F (40%) 3 M (60%) PhD = 1 1 F (100%)	M.Sc. = 4 1 F (25%) 3 M (75%) PhD = 1 1 F (100%)	M.Sc. = 4 2 F (50%) 2 M (50%) PhD = 3 1 F (33%) 2 M (67%)	M.Sc. = 4 2 F (50%) 2 M (50%) PhD = 0	M.Sc. = 32 14 F (44%) 18 M (56%) PhD = 8 3 F (38%) 5 M (63%)
Output N°2: Production and dissemination of new knowledge by GRÓ training participants and scholarship recipient									
P1. Number of research outputs (research project reports) annually by GRÓ fellows	Annual # of research project papers confirmed on GRÓ website	23	24	24	0	25	0	0	All fellows completed a paper. 96 were published on the GTP website
P2. Number of master's thesis published annually by GRÓ scholarship recipients (research output)	Annual # of published master's thesis at universities' websites	5	6	5	3	5	5	5	34 published
P3. Number of PhD papers published annually by GRÓ scholarship recipients (research outputs)	Annual # of publications in research journals	0	2	0	2	0	2	1	7 papers published
Output N°3: Professional empowerment of GRÓ training participants and scholarship recipients is increased through GRÓ community building and networking									
P1. Number of alumni events organised by GRÓ annually	Annual #	0	1 (anniversary workshop)	0	0	1 (side event of the WGC)	0	1 (side event of the WGC)	3 alumni events

PERFORMANCE INDICATOR	SPECIFIC INDICATORS	2017	2018	2019	2020	2021	2022	2023	SUMMARY
P2. Number of GRÓ funded alumni participating in regional and international conferences	Annual # Gender ratio M/F (%)	0	0	0	0	69 in-person, 108 remotely	0	48 in-person 20 F (42%) 28 M (58%)	117 in-person 108 remotely
P3. % of GRÓ short courses involving alumni in teaching/ organisation of short courses	Annual # (% of GRÓ short courses involving alumni)	100% (3 of 3 events)	83% (5 of 6 events)	100% (3 of 3 events)	100% (1 of 1 event)	100% (2 of 2 events)	100% (6 of 6 events)	100% (1 of 1 event)	95% (21 of 22 events)