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Evaluation of the International Geoscience and Geoparks Programme

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The evaluators are independent from UNESCO. Technopolis Group is an independent company based in the UK with offices around the world.

Abstract

The UNESCO International Geoscience and Geoparks Programme (IGGP) supports research and capacity development in Earth Sciences. The programme comprises two sub-programmes: the International Geoscience Programme (IGCP) and the UNESCO Global Geoparks (UGGp). The IGCP mobilises and supports a worldwide network of geoscientists to facilitate scientific cooperation to study the Earth and geological processes. The UGGp is a mechanism of international cooperation, promoting conservation of sites of international geological value through scientific research, education, and the engagement with local communities to promote a sustainable management of geological heritage and local economic development. The IOS Evaluation Office undertook an evaluation of the IGGP, examining its relevance; efficiency; effectiveness and impact; sustainability; partnership and cooperation as well as key achievements and value added of each component of the UNESCO geoscience work to the SDGs, the Sendai Framework and the African Union Agenda 2063. The evaluation found that the IGGP delivers on the targets despite limited resources. Its international, bottom-up, expert-driven nature is a key strength, but improvements could be made to further strengthen the functioning of the Programme.

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Ongoing quality assurance was provided by the Evaluation Reference Group, in which each Programme Sector and several relevant Field Offices were represented, along with the Division of Gender Equality. The IOS Evaluation Office would, in particular, like to express its gratitude to the Chief of Earth Sciences and Geo-hazards Risk Reduction Section of the UNESCO Natural Sciences Sector at UNESCO HQ, Mr. Kristof Vandenberghe.

Geert Engelsman, independent evaluation consultant, provided external quality assurance of the evaluation report.

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Abbreviations

AGEOCOL	Colombian Geothermal Association
APGN	Asia-Pacific Geoparks Network
ASPNet	UNESCO Associated Schools Network
BR	Biosphere Reserves
CYTED	Ibero-American Programme of Science and Technology for Development
DRR	Disaster Risk Reduction
EGN	European Geoparks Network
EQ	Evaluation Questions
ERG	Evaluation Reference Group
ESIF	European Structural and Investment Funds
GGN	Global Geoparks Network
IGCP	International Geoscience Programme
IGGP	International Geoscience and Geopark Programme
IOS	Internal Oversight Service
IUCN	International Union for Conservation of Nature
IUGS	International Union of Geological Sciences
JPDC	Jeju Province Development Corporation
LACGN	Latin American and Caribbean Geopark Network
MAB	Man and Biosphere
SDG	Sustainable Development Goals
SIDA	Swedish International Development Cooperation Agency
SIDS	Small Island Developing States
TBR	Transboundary Biosphere Reserves
ToC	Theory of Change
UGGp	UNESCO Global Geoparks
UK	United Kingdom
UKCUGG	UK Commission for UNESCO Global Geoparks
UKNC	UK National Commission
UNCLOS	United Nations Convention on the Law of the Sea
WHS	World Heritage Sites

Executive summary

I. Introduction

i. This evaluation of the International Geoscience and Geoparks Programme (IGGP) was conducted by IOS at the request of the UNESCO Natural Science Sector. The most recent evaluation of the International Geoscience Programme (IGCP) had taken place in 2013 and the other pillar of the IGGP, i.e. the UNESCO Global Geoparks (UGGp), had never been evaluated before. This evaluation was included in the IOS Evaluation Office work-plan for the year 2019, as indicated in the IOS Annual Report for 2018, presented at the 206th Session of the Executive Board (see 206 EX/21, Annex III, p. 2).

II. The International Geoscience and Geoparks Programme (IGGP)

ii. The International Geoscience and Geoparks Programme (IGGP) is part of the UNESCO portfolio of activities and programmes to support research and capacity development in the Earth Sciences, in line with the 2030 Sustainable Development Agenda. The Programme consists of two sub-programmes (pillars): the International Geoscience Programme (IGCP) and the UNESCO Global Geoparks (UGGp). The IGCP has been a UNESCO programme since 1972, and the UGGp was formally incorporated as a UNESCO initiative in 2015.

iii. The IGCP supports the study of the Earth's geological process through mobilising and facilitating scientific cooperation amongst a worldwide network of geoscientists. It offers grants to collaborative projects that prioritise capacity building, benefit to society, cooperation between scientists and, in particular, international participation that includes scientists from developing countries.

iv. The UGGp is a unique mechanism of international cooperation to conserve sites of international geological value by promoting scientific research, education and the engagement with local communities for the sustainable management of these sites and their geological heritage. The UGGp mainly provides certification to geoparks that meet specific requirements, including: possessing geological heritage of international significance; the existence of public facilities and service infrastructure; an offer of information, education and research activities; sustainable management practices; and geotourism activities.

v. A number of strategic partners collaborate in the management of the IGGP, namely: the Global Geoparks Network (GGN), the International Union for Conservation of Nature (IUCN) and the International Union of Geological Sciences (IUGS).

III. Objectives and methodology for the evaluation

vi. This document contains the results of an independent evaluation of the IGGP that was conducted primarily with the aim of reporting on the results generated by the IGGP. Lessons resulting from the evaluation shall feed into the Programme's learning processes by identifying what works well, what doesn't and the enabling and hindering factors of success. The evaluation also aimed at providing recommendations in order to improve programme implementation and related processes in the future. The evaluation covers the entire IGGP, including the IGCP and UGGp sub-pillars, over the 2014-2019 period.

vii. The evaluation was conducted between September 2019 and January 2020 with the support of an external team of both thematic experts and evaluation consultants. Data collection methods included: the development of a Theory of Change; an extensive literature review and desk research; attendance at the UGGp Council Meeting in Lombok, Indonesia; over 60 face-to-face and telephone interviews with programme managers and beneficiaries; and three country visits to Spain, Mexico and China. Quality assurance was provided by the IOS Evaluation Office with the support of a dedicated evaluation reference group, including representatives from the SC Sector, the Gender Equality Division, Programme governing bodies and strategic Programme partners.

viii. Primary intended users of the evaluation are UNESCO senior management and programme staff of the SC and other sectors in Headquarters and Field Offices, UNESCO Member States and Programme governing bodies such as the IGCP Council and Bureau, the UNESCO Global Geoparks Council and Global Geoparks Bureau and the IGCP Scientific Board. Secondary users of the evaluation include UNESCO's strategic Programme partners such as the Global Geoparks Network (GGN), the International Union of Geological Sciences (IUGS), the International Union for Conservation of Nature (IUCN) and national / regional IGCP and geopark committees.

IV. Findings

ix. The evaluation findings are as follows:

Relevance of the IGGP

The IGGP is designed to fulfil goals and ambitions, which are fully in line with the needs and challenges faced by its target populations and compatible with the strategic goals of institutional sponsors.

x. IGCP Project Leaders confirm that the design of IGCP is relevant to meeting local, national and international scientific needs. Programme beneficiaries regard the Programme as unique in supporting research collaboration in geoscience at the global level. For stakeholders in developing countries, it is often the only way to engage in international research projects. As for the UGGp, its goals are relevant to addressing a range of needs and challenges faced by applying territories. Key drivers of participation in the UGGp include 'improving the population's awareness of the geological heritage in the region', 'gaining visibility nationally and internationally' and 'stimulating local development and poverty reduction'.

xi. The current level of demand and interest in both pillars is very high and confirms the relevance of the Programme from a beneficiary perspective. The design of the Programme is flexible enough to cater to the needs of diverse populations and developmental contexts, including typically disadvantaged or underprivileged groups, women, girls, youth and early career scientists.

xii. The IGGP has been making a direct contribution to the expected results defined in UNESCO's 39 C/5 Programme and Budget for Major Programme II on the Natural Sciences and in particular its Main Line of Action 2: advancing science for sustainable management of natural resources. The IGGP also makes relevant contributions to UNESCO's global priorities on Africa and Gender Equality.

xiii. Geoscience and the increased understanding of geological structures and processes are relevant to several Sustainable Development Goals (SDGs), such as Goals 1, 4, 5, 6, 7, 8, 10, 11, 12, 13 and 17. The thematic areas that they refer to play a direct role, for example, in the sustainable use of natural resources (oil, gas, minerals) and in the management of water resources and agricultural land. The IGGP is thus highly relevant to UNESCO's mandate and ambitions to contribute to the SDGs as defined in the 2030 Sustainable Development Agenda.

xiv. The design of the IGCP and the UGGp align with the strategic objectives of the Programmes' two key strategic partners: the Global Geopark Network for UGGp (GGN) and the International Union of Geological Sciences (IUGS). As such, there is an important symbiotic relationship between the IGGP, UNESCO and these partners, which manifests itself in the day-to-day implementation of the Programme.

There is a lack of internal coherence within the Programme, illustrated by the absence of more formal programmatic links between the IGCP and the UGGp.

xv. The activities, outputs and medium-term outcomes of both IGGP pillars are quite distinct and, as a result, the governance and practical implementation of the sub-programmes under IGGP are largely separate. This separation is also due to the different histories of the two sub-programmes, with IGCP having been a UNESCO programme since its inception in 1972, while UGGp came into UNESCO in 2015 after a long history under the GGN. While the evaluation identified a meaningful potential for such closer collaboration, the actual level of cross-pollination from a programmatic perspective is very limited. This appears to be a missed opportunity for generating synergies towards achieving more significant results a**t a larger scale with an equal amount of resources.**

Efficiency of the IGGP

The expert-driven and international nature of the Programme is viewed as a key asset and continues to yield positive results.

xvi. Stakeholders consider the expert-driven nature of the IGGP to be a significant asset, enhancing the technical quality and relevance of Programme activities. Key Programme decisions, such as final project selection, are mainly taken by scientists in accordance with merit-based criteria. While the IGGP may be less prone to political considerations than intergovernmental programmes, it nevertheless faces the challenge of navigating between the interests of Member States and a scientific expert-driven process.

xvii. Mechanisms exist for Member States to contribute to the decision-making procedures of the Programme. For instance, in the case of UGGp, new geopark applications must first be approved by national-level authorities before being submitted to the Programme Council. Member State representatives can also participate as observers during Council meetings. The long-term sustainability of this model, including

continued buy-in from Member States that are the key UNESCO constituency, will only be guaranteed through the continued use of selection criteria that meet the highest standards of excellence and transparency.

xviii. The governance models of the Programme and both pillars are robust, and implementation is in line with the roles and responsibilities defined in the Programme guidelines. IGCP and UGGp National Committees are key to the delivery of the Programme and represent important local liaisons contributing to overall Programme awareness and visibility.

The IGGP Secretariat satisfactorily performs its co-ordination role, especially given its resource limitations.

xix. Both Programme pillars share a common Secretariat hosted by UNESCO. Currently, this Secretariat is composed of three full-time equivalent staff members. The Secretariat is responsible for all management and administrative support to the IGGP Councils, enabling them to conduct the project and geopark evaluation process, and for liaising with National Committees and UNESCO National Commissions during this process. In addition, the Secretariat engages in technical work and capacity-building activities.

xx. Programme stakeholders hold the Programme in high regard and perceive the performance of the IGGP Secretariat as very satisfactory, especially given strong resource constraints. In the last two years, the Secretariat embarked upon strengthening, clarifying and updating overarching processes to improve programme management. Resource limitations impact the Programme Secretariat's ability to generate solid monitoring and reporting data as well as effectively keep track of Programme beneficiaries and results. They also limit the Secretariat in their ability to engage in activities to further help the Programme grow, e.g. resource mobilisation.

xxi. The distribution of work among the UNESCO-hosted IGGP Secretariat and both partner organisations (i.e. GGN and IUGS) is well-balanced and contributes to an efficient implementation of shared responsibilities. The contributions made by both partners to Programme delivery are essential and heavily underpin Programme sustainability. This said, in the case of UGGp, there are frequent confusions within the geopark community with regard to the roles and responsibilities of the UGGp Secretariat as opposed to those of the GGN.

xxii. There is some level of involvement with both UNESCO Chairs and Category II Centres in the delivery of the IGCP. For example, the Category II Centre 'International Research Centre on Karst (IRCK)' was, in part, created as a result of prior IGCP projects and continues to be a key participant in relevant projects. Involvement of UNESCO Chairs and Category II Centres in UGGp, on the other hand, is very limited. Given the high number of relevant Category II Centres and Chairs, there may be additional opportunities to increase or build links with IGGP.

Despite the introduction of recent improvements in the selection procedures and criteria for geoparks and geopark evaluators, there is scope to enhance the quality and robustness of these under the UGGp.

xxiii. The IGCP selection process, and the governance arrangements that underpin it, follow fairly standard international best practice for managing research funding programmes. The evaluation revealed no major concerns with the project review or selection process. A great majority of Project Leaders who responded to the survey considered the process to be technically sound and transparent, expressing satisfaction with the clarity of information and the ease and timeliness of the process.

xxiv. The UGGp selection processes and criteria for geoparks and geopark evaluators have undergone significant updates in recent years, but remain the subject of debate among some members of the UGGp community. Issues raised during the evaluation involved: i) the interpretation of the significance of geological heritage of sites; ii) the consistent application of geoparks selection and evaluation criteria; and iii) the need to further formalise these criteria. As the selection of geopark evaluators is concerned, some stakeholders expressed the need to further clarify the criteria used to identify evaluators as well as to publish the results of the selection process.

xxv. This said, three quarters of the on-line survey respondents considered the technical and scientific soundness of the geoparks evaluation and designation process (including evaluation missions) as excellent or good. In particular, respondents praised the geoparks evaluation process as very positive, citing a process of learning and knowledge exchange rather than a top-down approach. According to the geoparks, going through the evaluation process itself provided them with valuable lessons and insights as to how improve their project.

The quality of programme monitoring may be improved.

xxvi. The IGGP as a whole does currently not have an appropriate monitoring and evaluation system. The Programme lacks a theory of change, as well as an accompanying results framework, thus not allowing for measuring the extent to which the Programme generates results in line with its original ambitions. This represents an opportunity for improvement for the Programme, both in terms of accountability and learning, as well as in terms of effective steering and management.

Effectiveness and Impact of the IGGP

Given the lack of a formal results framework, the evaluation was unable to produce a solid quantitative assessment of Programme effectiveness, yet the Programme is yielding positive results in line with intended goals.

xxvii. Through the IGCP, an average of 20 to 30 projects are funded each year. It reaches a wide community of scientists who actively engage in project activities in various ways, from conducting research and conducting field work to attending seminars, workshops, meetings and training courses. Only scientists from developing countries receive IGCP seed funding, which directly supports knowledge transfer and geoscience capacity-building in these countries. Project Leaders report a range of actual or expected project outputs in the form of new networks, scientific publications, high quality geoscience knowledge and knowledge relevant to society and new geoscience skills. Other perceived benefits of the Programme include lasting international partnerships and cooperation on geoscience and increased numbers of female geoscientists.

xxviii. The presence of UGGp is still mostly concentrated in Europe and Asia, but the Programme has gained significant importance in Latin America, in recent years. Expansion to sub-Saharan Africa and Arab States remains an important challenge, despite recent efforts to increase Programme presence and visibility in those regions. Evidence on the benefits generated by the access to the UGGp certification is abundant. UGGp outcomes include improved geopark management and planning systems, established links with geoparks from other countries, increased understanding of the importance of geological heritages and improving general culture and knowledge around them, more sustainable tourism and increased engagement on behalf of local / indigenous communities. The creation of employment and economic activity, potential reduction of migration, reducing territorial fragmentation / isolation and empowerment of women point to the likely broader socio-economic impacts.

Sustainability of the IGGP

Funding represents the most important limitation to Programme implementation and is a potential risk to Programme sustainability.

xxix. All stakeholders reported funding as an issue for IGCP, both in terms of its effects on the limited amount of funding for individual projects and the limitations in numbers of projects that can be supported at any one time. At present, demand outstrips supply by around 100%. Funding limitations faced by UGGp also represent a major bottleneck and will limit efforts to expand and improve the Programme. Financial sustainability of the Programme will also underpin the sustainability of the results generated.

For emerging geoparks, particularly in fragile contexts, ensuring sustainable sources of funding is a major hurdle and threat to survival.

xxx. Securing long-term funding streams is a critical issue, especially for geoparks in developing countries, which tend to have limited access to sources of public funding. The example of the Mixteca Alta geopark in Mexico perfectly illustrates this challenge. The issue is likely to be significant in new geoparks in Africa as well.

V. The way forward (conclusions and recommendations)

xxxi. In moving forward with the implementation of the IGGP, the Programme should capitalise and further build on the very positive results achieved to date. At the same time, it should take advantage of the opportunity to introduce some adjustments, which have the potential of significantly boosting its impact and ensuring its long-term survival. These mainly relate to the need to ensure a stronger commitment and broader financial base for the Programme and the operations of its Secretariat, as well as to the need to continue improving UGGp selection and evaluation procedures and criteria. Regarding the latter, while the UGGp should be looking to consolidate its expert-driven and international dimension, it should also ensure that the necessary conditions are established to generate full trust and confidence within the Member State community that decisions are taken on the basis of criteria and procedures which are of the highest standards.

xxxii. In the future, the IGGP – and particularly the UGGp pillar - should also explicitly ensure that it takes on a more targeted approach to providing support in Africa, as well as other regions of the world which are currently mostly absent from its realm of intervention, such as Arab States. The UGGp model and approach offer great opportunities to spur growth and social cohesion in isolated territories hosting fragile populations. This should be taken full advantage of in the future, while relying on the wealth of knowledge and expertise generated in the geopark community in more developed countries.

VI. Recommendations

xxxiii. The evaluation makes the following 10 recommendations:

Recommendation 1:
Make a clear statement regarding whether the Programme considers certain geographies or territories strategic priorities in the short term, and explicitly formulate and justify how these territories are to be pro-actively targeted through Programme activities.

Recommendation 2:
Undertake further efforts to enhance cross-pollination and programmatic synergies between IGCP and UGGp within the IGGP.

Recommendation 3:
Allocate additional resources to the IGGP Secretariat, mainly by bringing in additional staff.

Recommendation 4:
Maintain UGGp status as an international programme with a bottom-up, expert-driven orientation.

Recommendation 5:
Seek a more active participation of Member States in the Programme by promoting their involvement in existing UGGp mechanisms, such as the validation / sponsoring of aspiring geopark applications and participation in Council meetings as observers.

Recommendation 6:
Increase frequency of communication from the UGGp Secretariat to the geoparks and National Committees, on the support that can be provided by the Secretariat and to provide information on the latest UGGp developments.

Recommendation 7:
Improve guidance to countries that do not yet have a National IGCP or Geopark Committee, providing examples of how such Committees operate, including best practices for setting-up and maintenance.

Recommendation 8:
Implement a light, flexible and efficient mechanism allowing ongoing improvement of key aspects of UGGp, including its rules, regulations and documents.

Recommendation 9:
Develop and adopt a tailored results framework that is based on a Theory of Change and allows for the generation of quantitative assessments of Programme activities and results.

Recommendation 10:
Strengthen the longer term financial sustainability of IGGP, its sub-programmes and geoparks.

Management Response

Overall Management Response

The UNESCO Secretariat welcomes the findings and recommendations of this evaluation, covering important years since the merge of the UNESCO Global Geoparks with the long-standing and well-established International Geoscience Programme to form the International Geoscience and Geoparks Programme in 2015. In that sense, the Secretariat appreciates that most of the recommendations relate to the UNESCO Global Geoparks pillar of the Programme. The findings are very much in line with the Secretariat's own experience in the 4-year existence of the Programme and the recommendations are a welcome guideline to the improvement process that has been initiated over the last months. The Secretariat also welcomes the recognition of geosciences and IGGP for their role in the sustainable management of natural resources and UNESCO is pleased that the evaluation has confirmed the importance and relevance of the IGGP, as a unique instrument to support research collaboration in geoscience at a global level, and as a driver to stimulate local development and poverty reduction.

Recommendation	Management response
Recommendation 1: Make a clear statement regarding whether the Programme considers certain geographies or territories as strategic priorities in the short term, and explicitly formulate and justify how these geographies or territories are to be pro-actively targeted through Programme activities.	**Accepted** UNESCO Secretariat welcomes this recommendation, and agrees that there is a need for a strategic choice in both pillars of the programme. In both pillars of the programme, the UNESCO Secretariat will continue to encourage women and early career scientists to apply for capacity building events. The IGCP council has designed a strategic vision and has set thematic priorities, but it is important that the UNESCO global priorities are reflected in that vision. As for the UNESCO Global Geoparks, there is a historical overweight of UGGp in Europe and Asia. The UNESCO Secretariat has in recent years invested efforts in promoting the concept and building capacity in areas of the world where the concept was less known, with recent successes in Latin America, and will sustain and increase those efforts, in particular in Africa and the Arab states.
Recommendation 2: Undertake further efforts to enhance cross-pollination and programmatic synergies between IGCP and UGGp within the IGGP.	**Accepted** UNESCO Secretariat welcomes this recommendation. It is noted that the IGCP has grown into the well-established and respected International Programme in the course of 47 years, while the UGGp is a recent addition, but UNESCO Secretariat and the Councils of both pillars will continue to explore further interlinkages and opportunities to join efforts, where possible and relevant. It will be challenging to seek further efficiency gains from the UNESCO Secretariat, which is already understaffed and working in complete synergy, but the UNESCO Secretariat recognises that joint communication may lead to greater awareness of the existence of the two sub pillars of the Programme and demonstrate the impact of the Programme.

Recommendation 3: Allocate additional resources to the IGGP Secretariat, mainly by bringing in additional staff.	**Accepted** UNESCO Secretariat recognizes the challenge of adequate human resources to implement the Programme, in particular in the light of a growing UGGp network and an increased volume of high quality IGCP project proposals. UNESCO Secretariat will further explore options under secondment schemes, internship- and young professional programmes. When raising additional funds for the programme and where possible, proposals will include fund allocations for additional staff.
Recommendation 4: Maintain UGGp status as an international programme with a bottom-up, expert-driven orientation.	**Accepted** The UNESCO Secretariat welcomes this recommendation and will continue its efforts to provide clarity on the application, monitoring, evaluation and revalidation mechanisms, providing further transparency and consistency with Statutes and Operational Guidelines for the IGGP. The UNESCO Secretariat invested in checklists, explanatory notes, clearer criteria for evaluators, a training and evaluation mechanism for UGGp evaluators, a clearer guidance for IUGS evaluators, on-line educational tools, courses and exchange programmes, amongst others. Some of these tools, forms and documents have been introduced in the course of the past months, others are in preparation, all in full cooperation with experts and statutory partners like the GGN, the UGGp, IUCN and IUGS, with the intention to provide clarity for evaluators, aspiring and existing UGGP and Member States alike, on the criteria as described in the statutory documents. The UNESCO Secretariat will continue on this momentum, to assure high quality standards and transparency in its governance processes. The UNESCO Secretariat engages itself to further make all documents publically available, open UGGp Council sessions to Observers from Member States, and release the report with the decision of the UGGp Council shortly after the UGGp Council session.
Recommendation 5: Seek a more active participation of Member States in the Programme by promoting their involvement in existing UGGp mechanisms, such as the validation / sponsoring of aspiring geopark applications and participation in Council meetings as observers.	**Accepted** While the UNESCO Global Geoparks are established with a strong grass root character, building on the commitment of local communities and stakeholders, the UNESCO Secretariat is aware that they strongly rely on governmental support. A good understanding of the UNESCO Global Geopark concept amongst UNESCO National Commissions and relevant governmental institutions is therefore key in further expanding the network. For that reason, the UNESCO Secretariat will continue including these target groups in its promotion and capacity building events. A close cooperation and consultation with Member States is not only key for ownership, it also contributes to furthering the quality and transparency of the governance mechanism, reason why the UGGp Council meetings welcome the increased participation of Observes from Member States. The UNESCO Secretariat will also continue to advocate good practices of such interaction between Member States and their UGGp.
Recommendation 6: Increase frequency of communication from the UGGp Secretariat to the geoparks and National Committees, on the support that can be provided by the Secretariat and to provide information on the latest UGGp developments.	**Accepted** While the statutory obligations related to the evaluation process for aspiring and existing UGGp, in addition to the preparations of the Council meetings will remain to a large extent hidden for the Geoparks community, the UNESCO Secretariat takes note of the importance to communicate clearly and frequently with the GGN and the respective UGGp on their actions and efforts to improve governance processes and support communication, promotion and capacity building activities. The preparation of an annual report by the UNESCO Secretariat to the GGN on the expenditure of the GGN contribution will contribute to this effort.

Recommendation 7: Improve guidance to countries that do not yet have a National IGCP or Geopark Committee, providing examples of how such Committees operate, including best practices for setting-up and maintenance.	**Partially Accepted** Very much in line with Recommendation 5, the close involvement of Member States is key to the success of the expansion of the UGGp Network, and the creation of National Geopark and IGCP committees facilitates knowledge transfer within the countries, within the regions and with UNESCO. The UNESCO Secretariat can also provide information on good practices and maintain regular contact with these bodies. However, the creation of such committees is national sovereignty and their sustainability is largely dependent on local commitment.
Recommendation 8: Implement a light, flexible and efficient mechanism allowing ongoing improvement of key aspects of UGGp, including its rules, regulations and documents.	**Accepted** This recommendation is closely linked with recommendation 4, aiming at securing standard processes and procedures for the governance of the IGGP, and in particular the UGGp pillar. The UNESCO Secretariat is engaged in a continuous process of improving processes and procedures, in respect with the rules and regulations as adopted by the General Conference of UNESCO at its 38th session in 2015. Still in line with Recommendation 4, and in respect with the expert-driven character of the Programme, the Secretariat does this in full coordination with the experts of its Statutory partners (UGGp Bureau and Council, GGN, IUCN, IUGS) and any other relevant stakeholder. With the ambition to assure consistency and transparency in the process, it will also continue to propose changes and improvements in documents, clarifications on criteria, updates on evaluator rosters, and any other action that professionalises the application, monitoring and evaluation processes, and inform Member States thereof. The UNESCO Secretariat will also hold regular information meetings for Member States, hold surveys with Member States and experts alike to improve the impact of the Programme, and consult with Observers from Member States at UGGp Council sessions. The UNESCO Secretariat also welcomes the opportunity to clarify any of the decisions taken by the UGGp Council.
Recommendation 9: Develop and adopt a tailored results framework that is based on a Theory of Change and allows for the generation of quantitative assessments of Programme activities and results.	**Accepted** This recommendation is welcome and UNESCO Secretariat agrees that a more detailed results framework would facilitate the monitoring against the SDGs and overall impact of the programme. The current tracking system in SISTER already allows us to identify activities that contribute to the SDGs, against specific targets and performance indicators, including the number of Geoparks involved, the number of women and early career scientists trained, the relevance for Africa and SIDS, , but the Secretariat agrees that the current reporting system could be improved by including other relevant indicators. This would imply a reporting framework that would allow the UNESCO Secretariat to obtain reporting information on the activities developed within the UNESCO Global Geoparks, and that it can track the outcome and results of the IGCP projects all the way up to measure their impact.
Recommendation 10: Strengthen the longer term financial sustainability of IGGP, its sub-programmes and geoparks.	**Accepted** This recommendation is strongly related to recommendation 3, proposing additional resources to IGGP, basically by bringing in additional staff. To assure the statutory obligations in a context of a fast expanding network, the UNESCO Secretariat will need to invest part of its budget and time in Resource Mobilisation. The UNESCO Secretariat will also engage with GGN and the regional networks in exchanging good practices and funding opportunities for UGGp where relevant.

I. Introduction

1.1 Background

1. The International Geoscience and Geoparks Programme (IGGP) is part of the UNESCO portfolio of activities and programmes to support research and capacity in Earth Sciences, in alignment with the 2030 Sustainable Development Agenda. The Programme consists of two sub-programmes (pillars): the International Geoscience Programme (IGCP), which mobilises and supports a worldwide network of geoscientists to facilitate scientific cooperation to study the Earth and geological processes; and the UNESCO Global Geoparks (UGGp), which is a mechanism of international cooperation that promotes conservation of sites of international geological value through scientific research, education and engagement with local communities to promote the sustainable management of these sites and their geological heritage. While the IGCP has been a UNESCO programme since 1972, the UGGp was formally incorporated as a UNESCO initiative since 2015.[1]

2. This evaluation assessed the performance of the overall IGGP, as well as the appropriateness of its implementation mechanisms and processes. Upon the request of UNESCO's Internal Oversight Service and the Natural Sciences Sector (SC), the evaluation recommendations aim to shape the future of the IGGP, increasing its impact and meaningfulness.

1.2 Purpose and use of the evaluation

3. This evaluation of the IGGP was conducted by IOS at the request of the UNESCO Natural Science Sector. It was included in the IOS Evaluation Office work-plan for the year 2019, as per the IOS Annual Report for 2018, presented at the 206th Session of the Executive Board (206 EX/21, Annex III, p. 2). The evaluation draws conclusions and lessons from the results generated by the IGGP, which aim to feed into the Programme's learning process, identifying what works and factors of success, and suggesting how to improve the functioning of the Programme and its two pillars to ensure results align with intended objectives. Specifically, the evaluation set out to:

- Assess the IGGP's (i.e. IGCP and UGGp) relevance, efficiency, effectiveness and impact, sustainability, partnership and cooperation.
- Provide evidence on key achievements and value added of each component of the UNESCO geoscience work to the SDGs, the Sendai Framework and the African Union Agenda 2063.
- Draw conclusions and formulate lessons learnt for the International Geoscience Programme (IGCP), the UNESCO Global Geoparks Programme (UGGp) and the IGGP as a whole.
- Provide recommendations for the future design and functioning of the IGGP and its two pillars to be followed by a management response leading to concrete actions.

4. Users of the evaluation results presented in this report include a range of stakeholders. Among these are UNESCO staff in Headquarters and Field Offices, Member States, the governing bodies of the Programme such as the IGCP Council and Bureau, the UNESCO Global Geoparks Council and the UNESCO Global Geoparks Bureau and, finally, the IGCP Scientific Board. Additional expected users of the evaluation include UNESCO strategic partners for delivery of the Programme: the Global Geoparks Network (GGN), the International Union of Geological Sciences (IUGS), the International Union for Conservation of Nature (IUCN); and national / regional IGCP and geopark committees.

5. The evaluation covered the entire IGGP including its two sub-programmes (i.e. IGCP and UGGp) over the 2014-2019 period. It built on the previous evaluation published in 2004 'External Evaluation of the UNESCO-IUGS International Geological Correlation Programme (IGCP) for the period 1997-2002' and the ad-hoc review of the IGCP carried out in 2013.

1.3 Evaluation questions

6. A set of evaluation questions (EQs) shows the main issues and topics assessed as part of the evaluation. A total of 16 evaluation questions were defined, which have been organised under five key evaluation criteria (i.e. relevance, efficiency, effectiveness and impact, sustainability, partnership and cooperation). The full list of evaluation questions can be found in Appendix B.

1 36C/Resolution 31 on cooperation between UNESCO and the Global Geoparks Network (GGN), 190 EX/Decision 5 (I), 191 EX/Decision 5 (III), 192 EX/Decision 9, 37 C/Resolution 26, 194 EX/Decision 5 (I, G), 195 EX/Decision 5 (I, A), and 196 EX/Decision 5 (I, C)

1.4 Description of the International Geoscience and Geoparks Programme[2]

7. In its current form, the Programme with its two components, IGCP and UGGp, has been operational since 2015. Previously, only the IGCP was part of the UNESCO portfolio of activities in support of geosciences. Through both pillars, the IGGP provides support for research projects and promotes an international network of high-level researchers on topics such as responsible and environmental extraction of resources, resilience and preparedness to natural hazards as well as adaptability in the era of a changing climate. The Programme has developed a network of sites of geological value that, through research and community engagement, seeks to promote conservation and sustainable use of resources.

8. The IGCP pillar offers grants to collaborative projects that prioritise capacity building, benefit to society and cooperation between scientists and, in particular, international participation of scientists from developing countries. The UGGp pillar's main activity is to certify geoparks which meet certain requirements including possessing geological heritage of international significance; existence of public facilities and service infrastructure; provision of information, education and research activities; sustainable management practices; and geotourism activities. The two pillars are complementary as one aims to provide scientific explanation of geological processes while the other works on the sustainable management of sites of geological value and educational outreach.

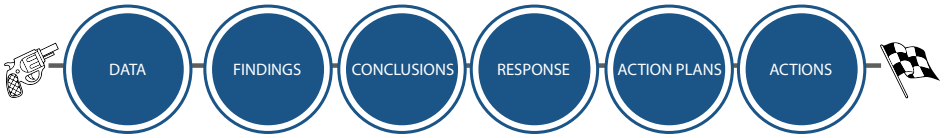
9. Through its work, the IGGP seeks to facilitate an interdisciplinary and integrated approach to the earth sciences, incorporating the social dimension of the geological processes and promoting international research in natural hazards and disaster risk reduction and mitigation. This work aims to assist UNESCO Member States (MS) in their efforts to strengthen scientific and technological capacity to identify, monitor and respond to hazards, as outlined in the Sendai Framework for Disaster Risk Reduction 015-2030.[3] Through the Programme, UNESCO contributes to the implementation of the 2030 Agenda for Sustainable Development, the Paris Agreement on Climate Change and the pursuit of its two global priorities Africa and Gender Equality, as they apply to earth sciences.

10. A more detailed presentation of the Programme, including its governance structure and Theory of Change,[4] is included in Appendix C.

1.5 Approach and methods

11. The evaluation was carried out in three phases: a preparatory phase; a phase of data collection and an extensive analysis of IGGP activities and governance, accompanied by drafting in-depth case studies (see Appendix E for case study reports); and the phase of drafting of the final report and recommendations. These phases would be followed by the development of a management response and action plan. Data collection was carried out through several methods and tools and emerging evaluation findings were triangulated during the analysis phase.

Figure 1 Overview of the data to action-trajectory of the evaluation



12. The key data collection and analysis tools deployed during the evaluation included:

- IGGP Theory of Change (ToC): The evaluation team developed a comprehensive ToC for the IGGP using existing documentation as well information gathered from initial interactions with IGGP stakeholders and, in particular, the Evaluation Reference Group.[5] The IGGP was not equipped with a formal ToC prior to this evaluation. Developing the ToC supported the identification of key assessment criteria for the evaluation, as well as yardsticks to measure programme success. The ToC is included in Appendix C of this report.

2 UNESCO (n.d). Retrieved from http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/international-geoscience-and-geoparks-programme/ IGCP. (2018). IGCP 2017 Annual Report. UNESCO. (2019). Retrieved from http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/international-geoscience-programme/proposal-submission/ IGGP. (2015). Statutes of the International Geoscience and Geoparks Programme

3 Activities on disaster risk reduction are outside the scope of this evaluation.

4 The IGGP has not officially adopted a ToC. The ToC presented in the Appendix has been developed by the evaluation team for the purpose of this evaluation, in collaboration with IGGP stakeholders (the Evaluation Reference Group).

5 Technopolis Group (September 10, 2019). ToC Workshop.

- wIn the early stages of the evaluation, a member of the evaluation team attended the UGGp Council Meeting in Lombok, Indonesia and observed the functioning of the council. He also visited the Asia-Pacific Geopark Network (APGN) meeting, which took place soon after. This in-person observation provided a glimpse of the work and impact of Asian-Pacific geoparks, as well as the benefit of the meetings of regional networks.
- An extensive literature review extracted information relevant to the questions elaborated in the evaluation matrix. Literature included programme documents, evaluation reports and project documents, among others. Appendix F contains the full list of documents consulted during the evaluation. The evaluation team also obtained information from UNESCO's SISTER reporting system.
- Four on-line surveys were distributed to IGGP stakeholders and beneficiaries including: one targeting UGGp geoparks, one survey for UNESCO National Commissions and National Geopark Committees on the UGGp, one survey targeting IGCP project leaders and finally one destined for UNESCO National Commissions and National IGCP Committees on the IGCP. Respondents responded to closed questions where they had to choose from provided options, as well as open questions where they were free to write text of their own. The online survey was available for respondents to complete for one month, from 31 October 2019 to 27 November 2019. The number of respondents to each survey can be found in the table below. In addition, an overview of the survey results is in Appendix D.

Table 1 Number of responses per survey category

Survey name	Number of replies
IGCP project leaders	47
UNESCO National Commissions and National IGCP Committees on the IGCP	20
UGGp geoparks	104
UNESCO National Commissions and National Geopark Committees on the UGGp	19

Source: Online surveys

13. The evaluation team interviewed 62 programme stakeholders, either face to face or via telephone. Interviewees included UNESCO representatives; Member State representatives; UNESCO National Commissions; National Geopark Committees; UGGp and IGCP Council and Bureaux members; geopark evaluators; coordinators of EGN and APGN; GGN members; UGGp observers and partners; and geopark representatives. Several individuals interviewed carried out more than one role in the delivery of the Programme (i.e. UGGp council member and geopark evaluator). Appendix G provides a list of interviewees.

14. The evaluation team developed five case studies (two for IGCP and three for UGGp) looking at specific projects supported by the IGCP, as well as specific geoparks designated by the Evaluation Reference Group. In the case of UGGp case studies, the evaluation team carried out short field visits of the selected geoparks.

1.6 Limitations

15. .In general terms, the evaluation methodology was carried out without any major deviations. Participation and response rates were high overall, which allowed the team to collect a critical mass of information deemed sufficient to formulate credible findings. Perhaps the most important challenge faced by the evaluation team related to the lack of more organised and structured data regarding programme activities and results. This kept the team from developing a quantitative overview of what the Programme does and has achieved during the period covered by the evaluation (i.e. the lack of a clear database of programme beneficiaries and outcomes, roster of UGGp evaluators).

16. This issue is explored in more detail in subsequent sections of the report and represents an important finding with regard to the quality and robustness of existing monitoring, reporting and evaluation systems set in place by the IGGP. IGGP stakeholders tend to be passionate about the work they do. This sometimes translated into divergent accounts. In some cases, it was challenging to translate these divergent accounts into findings and, ultimately, conclusions.

1.7 Reading guide

17. This evaluation report is structured according to the evaluation criteria of relevance, effectiveness and impact, efficiency and sustainability. The criterion of partnerships and collaboration criteria is addressed as a cross-cutting issue within sections of other evaluation criteria (e.g. efficiency). Each chapter sets out the key findings and conclusions. The final chapter presents the overall conclusions and recommendations of the evaluation. The report also includes appendices containing additional information on the IGGP, data collection methods and results. Given the important split in the activities and management of both of the programme's sub-pillars, many of the findings presented in the report are divided into UGGp and IGCP-specific sub-sections.

18. Given the relative complexity of the IGGP, some readers may wish to read additional information materials on the IGGP as needed to facilitate a deeper understanding of the information and findings presented in this report.

2. Relevance of the IGGP

2.1 IGGP relevance regarding needs and priorities of target beneficiaries

19. Given the important differences between the IGCP and UGGp in terms of target groups and activities, the evaluation did not collect data on the overall relevance of the Programme with regard to beneficiary needs, but rather assessed the work of each sub-programme.

20. Data collected through the evaluation show that IGCP project leaders firmly believe that the design of IGCP is relevant to meeting local, national and international scientific needs. This perception is largely shared by representatives of UNESCO National Commissions as well as IGCP and UGGp National Committee members. The degree of relevance of programme design is found to be slightly less important with regard to disaster risk reduction (at the international, national and local levels) as well as to national and local sustainable development needs. In general, the IGCP project leaders view the relevance to scientific needs as greater, while the UNESCO National Commissions as well as IGCP National Committee members take a broader view of its relevance. In addition, data collected through the evaluation show that IGCP project leaders regard the Programme as unique in supporting global scale research collaboration in geoscience. For those in developing countries, it is often the only way to engage in international research projects. International participation in IGCP is extremely broad, covering all continents, implying relevance to national needs. For example, in the two case studies project leaders and participants came from 14 countries across all continents.

21. The IGCP objectives on societal relevance are embodied in the IGCP proposal guidelines, which clearly state that project proposals should identify possible societal relevance. The two IGCP case studies provide examples of projects that do this. They both address societal needs in specific locations worldwide, but with broader global relevance. The first one (project number IGCP-640) focuses on the hazards posed by sub-marine and sub-aqueous landslides that may endanger human life via coastal damage or tsunamis. The second one (IGCP-636) addresses the use of geothermal energy as a low carbon energy source. Not only are these projects relevant to important societal issues, but both work to engage policy-makers and the general public to widen the impact of their research to relevant stakeholder communities.

22. Data collected through the evaluation show that the UGGp objectives are highly relevant given the needs of the target beneficiaries. The totality of participating geoparks indicated through the on-line survey that the UGGp designation was either relevant or highly relevant with regard to their local needs. It is interesting to note that the three key motivations to seek the UGGp designation are 'improving the population's awareness of the geological heritage in the region', 'gaining visibility nationally and internationally' and 'stimulating local development and poverty reduction'.

23. These findings are supported by the geopark case studies carried out in Xingwen (China), Villuercas (Spain) and Mixteca Alta (Mexico). For instance, in the case of Xingwen, the UNESCO Global Geopark concept is aligned with a strong national geoheritage conservation agenda and a powerful poverty alleviation and poverty elimination agenda of the Chinese government. In the case of Mexico, addressing poverty was also a key challenge for which the UGGp was seen to be a potential powerful source of mitigation. What's interesting to note in all three cases, as well as among the survey respondents, is that the geopark approach proposed by UGGp is broad enough for geoparks located in highly differing developmental contexts to find it relevant and useful based on their own needs.

24. It is also interesting to note that the UGGp certification is not always accompanied by a strong policy drive at the national level. Less than half of survey respondents (i.e. 41%) indicated that the effort to obtain the UNESCO Global Geopark designation was part of a national strategy to enhance geoheritage protection. The remaining half appear to have done this as part of strictly 'local' efforts, which may or may not be linked to any particular policy efforts set in place by local governments. As such, while the effort to gain access to the UGGp certification may be enhanced by the support provided by government (local or national), it does not appear to be a sine qua non element for access to the certification.

25. National-level authorities confirm the relevance of the UGGp. National stakeholders include UNESCO National Commissions or members of the national geopark committees (e.g. 74% of Natcoms and UGGp committees indicate that the UGGp designation is highly relevant to their country needs, as compared to only 5% which don't find it relevant).

26. The current level of demand and interest in geoparks and the UGGp certification also speak to the relevance of the Programme given the interests and priorities of potential beneficiaries. In Latin America, for instance, there has been important growth in the number of recent geopark initiatives that aspire to become UGGp-certified. This said, it appears that the UGGp geopark designation has thus far generated little demand or interest in a number of countries, which are still absent from the Programme or have very limited involvement. This includes large and significantly developed countries such as Australia, Brazil6 and the Russian Federation7 as well as smaller and / or less developed countries, such as some African countries.8 The extent to which the lack of stronger participation relates to a low degree of relevance of the Programme in those contexts or simply stems from a lack of local capacities or visibility of the Programme, is not fully clear.9

6 One aspiring geopark.
7 Once recently approved geopark.
8 Based on the estimates of the evaluation team, Europe hosts a total of 74 geoparks, as compared to 59 in Asia, 10 in America, 2 in the Middle East and 2 in Africa.
9 According to one expert: "in the USA or Australia, national law is incompatible with UGGp –parks are run by the federal government with a focus on protection, which does not allow for development or human settlement as one would understand it for a UGGp."

2.2 IGGP relevance regarding UNESCO's current strategy and priorities

27. IGGP directly contributes to UNESCO's 39 C/5's Major Programme II on the Natural Sciences and its Main Line of Action 2: advancing science for sustainable management of natural resources, in particular Expected Results 4 and 6 (Member States have strengthened their responses to local, national and regional water security challenges towards achievement of water- related SDGs and targets and Member States have developed UNESCO– designated sites as learning sites for inclusive and comprehensive approaches to environmental, economic and social aspects of sustainable development). According to the 39 C/5, the Programme is also expected to contribute to UNESCO's global priorities Africa10 and Gender Equality and drive UNESCO's contribution to supporting Member States in the implementation of the 2030 Agenda. Stakeholders consider the IGGP among the comparative advantages UNESCO has in supporting resilient societies, combined with its work with the International Hydrological Programme, on the Man and the Biosphere Programme and in Disaster Risk Reduction. As such, and from a formal perspective, the IGGP fits well with UNESCO's overall institutional mandate and priorities.

28. The IGGP is also relevant given UNESCO's mandate and strategic ambitions to contribute to the Sustainable Development Goals defined in the 2030 Sustainable Development Agenda. Geoscience and the increased understanding of geological structures and processes it provides relate to several Sustainable Development Goals. They play a direct role, for example, in the sustainable use of natural resources (oil, gas, minerals) and in the management of water resources and agricultural land. Other relevant SDG are highlighted in the ToC for IGGP (presented in Appendix C) as well as in an analysis presented by the Geological Society of London, which shows the contribution of geosciences to 13 SDGs (presented in Appendix I).

29. UNESCO representatives interviewed as part of this evaluation confirmed the relevance of IGGP with regard to UNESCO's institutional priorities.[11] When it comes to the UGGp, perhaps the best indicator of programme alignment with UNESCO's institutional mandate is the longstanding history of cooperation UNESCO has with

10 In practice however, and as is further explained in other sections of the report, the contribution of UGGp to Priority Africa appears to be limited.
11 The Assistant Director General for the Natural Sciences Sector who oversees the Programme was not interviewed as part of the evaluation.

the global geoparks network, as well as the decision taken in 2015 to formally incorporate the Global Geoparks Programme as a UNESCO-sponsored programme. Additionally, in the case of IGCP, the longevity of the Programme, which dates back to 1972, demonstrates relevance.

30. While UNESCO's current institutional strategy points to the complementarity of existing natural science programmes in supporting the 2030 sustainable development agenda, the issue of exactly how complementary these programmes manifest themselves (or are) in practice, surfaced during this evaluation. Particularly, the evaluation team considered the strong similarities among the MAB and World Heritage Sites programmes and the IGGP. Based on the evidence gathered through the evaluation, despite there being a clear-cut distinction between the MAB and UGGp, particularly in terms of governance (i.e. intergovernmental vs. expert driven), and areas of focus (i.e. MAB does not address geological heritage), the differences between both programmes in practical terms and from an on-the-ground perspective are not always profound. The following three examples illustrate the existence of blurred borders between both programmes:

   - At the level of geoparks, a number also have MAB accreditation[12] for the entire geopark or part of the territory or actively cooperate with other MAB biospheres at the national or international level. During the field visit to the Mixteca Alta Geopark in Mexico, a delegation from a Honduran MAB site was hosted to exchange experiences between both territories.

   - End-users (e.g. geopark visitor) often overlook the distinction between the MAB and the UGGp certification. Many people know these areas as 'UNESCO reserves', without making any specific distinction in terms of type of heritage being protected or field of science concerned.

   - From a practical point of view, there also appear to be strong similarities in what both programmes aim to achieve and how they set out to do so (i.e. both of the programmes' intervention logics). Having had the opportunity to conduct back-to-back visits to a MAB site and a UGGp site as part of this evaluation, one team member got to appreciate how both programmes translate into similar activities and structures at the ground level.

12 Out of the 103 geoparks participating in the on-line survey, 19 also have the MAB certification, and 20 are World Heritage Sites. The UGGp does not appear to have any extensive data on the number of UGGp, which have another UNESCO special site recognition.

31. All three of the above point to the potential of enhancing cooperation and streamlining of activities between both programmes.

2.3 Internal coherence of the IGGP: the link between UGGp and IGCP

32. From the early stages of this evaluation (i.e. the development of a single, unified Theory of Change for the IGGP) it became evident that the sub-programmes' activities, outputs and intermediate term outcomes are distinct. Additionally, the sub-programmes represent different interventions in the geological domain. These factors contribute to the separation of the governance and the practical implementation of the sub-programmes under IGGP, which is also due to the different histories of the two sub-programmes and their dates of incorporation into the IGGP. Despite some staff members of the respective Secretariats working on both pillars simultaneously or having worked for both in the past, the level of cross-pollination from a programmatic perspective seems limited. This is illustrated by the lack of data and information regarding the number of IGCP-supported projects with direct linkages to UGGp geoparks. From an administrative perspective, the lack of linkages between IGCP and UGGp is also illustrated by the fact that both sub-programmes do not carry out common reporting under ER4, despite the fact that both are linked to it.

33. Based on the data gathered from the on-line survey, however, it appeared that there are linkages between the work done through UGGp and IGCP. Approximately 40% of IGCP project leaders and geoparks indicate having collaborations with geoparks and IGCP respectively. In addition, among geoparks, the level of collaboration with MAB and World Heritage sites is considerable.

34. To some extent, this lack of formal and pro-active interaction between IGCP and UGGp can be seen as normal given that the UGGp is much more recent, as compared to its IGCP counterpart. The decision to incorporate the UGGp under the IGGP umbrella appears to have been a pragmatic one, rather than a decision driven by a true desire to enhance synergies between both sub-programmes. Currently, this lack of collaboration does not seem to impact either programme's ability to deliver their activities and reach their expected objectives.

35. Despite the absence of any negative effects linked to the lack of more pro-active collaboration between both pillars of the IGGP, there appears to be an important missed opportunity to generate 'more and better results' with an equal amount of resources. Further strengthening the internal coherence of the IGGP would foster a more unified and coherent approach to supporting the geosciences worldwide on behalf of UNESCO and its external partners, such as the GGN and the IUGS. Suggestions provided by survey respondents to enhance collaboration between both sub-programmes included:

- Projects under IGCP should include work in geoparks;
- Added financial incentives for IGCP training and outreach initiatives to take part in UGGp locations, and for UGGp to provide list of priority geoscience themes where they would like to enlist the help of an IGCP project (e.g. landslide risk reduction); and
- Having at least one dedicated session to IGCP during the annual UGGp conferences.

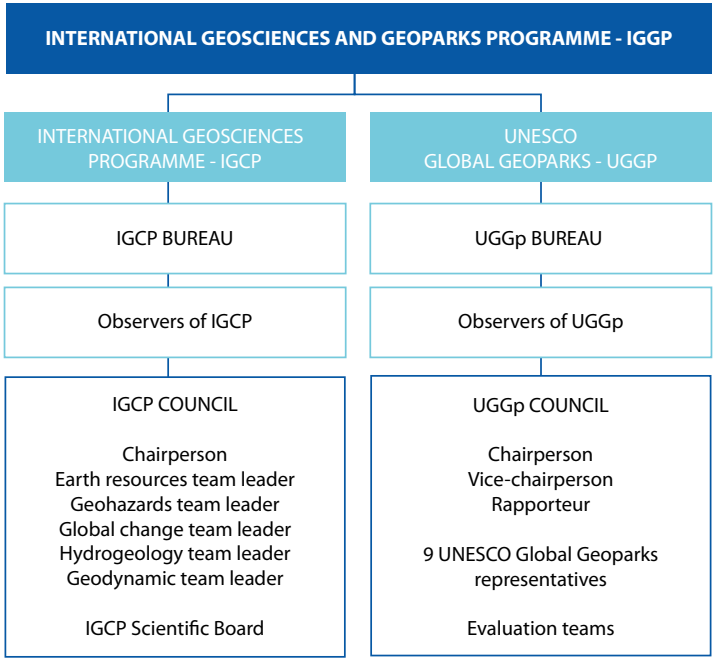
2.4 IGGP coherence regarding Programme's key partners priorities and work

36. The IGGP is implemented in collaboration with two key external partners: the Global Geopark Network (GGN)13 for UGGp; and the International Union of Geological Sciences (IUGS) for IGCP and UGGp. Both organisations play an important role in the overall governance of the Programme.

37. In the case of the IUGS, it worked in partnership with UNESCO to create IGCP in the early 1970s to address the challenge of global cooperation in geoscience, an inherently global science, in the midst of the Cold War. Since the outset, IUGS provided a considerable share of the grant funding provided by IGCP, with this money representing a substantial proportion of IUGS's annual income. The current IGGP statutes indicate that the IGCP Council shall be composed of six ordinary members, with the right to vote, appointed by mutual agreement by the Director-General of UNESCO and the President of the IUGS. IUGS also acts in the role of observer for both the IGCP and UGGp Bureaux. The requirement for global cooperation in geoscience remains, albeit with different global challenges, and IUGS clearly state that IGCP remains an integral and important part of IUGS activities.

13 The GGN involvement is historic. GGN, an association registered under the French law, had administered the programme between 2004 and 2015 while it was only 'under the auspices of UNESCO' and before it became a full-fledged UNESCO programme in 2015. After that, GGN remained an integral part of the UGGp with a strong capacity-building and networking mandate.

Figure 2. IGGP Governance Structure



Source: UNESCO

38. The design of the IGCP and the UGGp clearly align with the strategic ambitions and objectives of both strategic partners, IUGS and GGN. As such, there is an important symbiotic relationship between the sub-programmes, UNESCO and these partners, which manifests itself in the day to day implementation of the pillars. As will be described in further sections of this report, both of these partners are crucial to the continued existence of the Programme. In both cases, the IGGP does appear to be a clear example of how UNESCO can leverage strategic partnerships in the effective delivery of its work programme and initiatives.

39. This said, the strong reliance on the GGN and the IUGS for the delivery of the IGGP comes with a certain number of potential downsides. First and foremost, it puts UNESCO in a position where it relies on the work and inputs of external partners, which

it has no direct influence on, in order to achieve its objectives. As such, the continued support provided by these partners as well as the quality and credibility of their work are at the heart of the sustainability of IGGP. Finally, the involvement of GGN and IUGS in IGGP sometimes appears to create a confusion within the Programme beneficiary and stakeholder community as to who is doing what. In the case of UGGp, it is clear that geoparks themselves often find it difficult to understand what type of support is supposed to stem from the UGGp as a Programme, and what type of support should stem from GGN. When it comes to IGCP, there does not seem to be the same level of confusion, perhaps due to its long history within UNESCO.

3. Efficiency of the IGGP

3.1 The governance of the IGGP at the central and local levels

3.1.1 IGCP

40. The IGCP consists of four bodies: the International Geoscience Programme Bureau, International Geoscience Programme Council, Scientific Boards and the Secretariat.

41. The IGCP Council is responsible for advising the Director-General of UNESCO and the President of IUGS on the strategy, planning and implementation of the IGCP with key roles being to review and prioritise submitted project proposals. The IGCP Bureau makes the final decisions on which projects to fund and levels of funding and is the key point of coordination with UGGp. The Council is supported by four Scientific Boards and the Secretariat supports all of these above bodies.

42. IGCP is an international programme driven by scientific excellence aligned to societal needs. As is common practice in research funding worldwide, projects are evaluated and selected by expert peer review in terms of scientific excellence, first and foremost, plus alignment with programme criteria (technical themes, supporting collaborations with developing countries, supporting women and young scientists, etc.). Even though IGCP funding is relatively small 'seed' funding to support specific collaboration activities rather than the research activities themselves, it is the underpinning quality of the research that gives the programme credibility within the geoscience community it is targeted at.

43. Therefore, to work in this way, the IGCP Bureau[14] and Council consist of experts in geoscience from the global community, with the Bureau also having the UNESCO Director-General as a member. The six Council members (the Chair plus five members), for example, must hold a PhD in Earth Science[15] and the majority are academics along with experts from national geological surveys and public sector research institutes. Council members have a four-year term of office, renewable once, with membership designed so that every two years half the membership of the Council shall be renewed. These terms were introduced in 2015[16] to ensure a more dynamic membership.

44. The Council is supported by five scientific boards, aligned with the five themes of IGCP (Earth Resources, Geodynamic, Global Change, Geohazards, Hydrogeology), each with 8-12 specific experts and chaired by a Council member. Members serve in a personal capacity, not as representatives of their respective states or any other affiliations. Council members are appointed by the UNESCO Director-General and Scientific Board members by the Council, with all appointments based on scientific expertise and experience while taking into account, as far as possible, an equitable geographical distribution and gender equality. The majority of the work of the Council and Scientific Boards, in particular, is given to the review and selection of projects for IGCP funding and the annual review of projects in progress.

45. The IGCP Council and Bureau meet once a year for the IGCP Annual Meeting. This comprises a series of open and closed meeting sessions (for example, closed Council sessions to review and select projects for funding). UNESCO National Commissions and IGCP National Committees are invited to the open sessions. Annual reports and minutes of the open meetings are published and openly available via the IGCP website. Minutes of the closed meetings are also kept.

46. The evaluation evidence from the surveys and interviews demonstrated no concerns with the selection of Council, Bureau and Scientific Board members or with their work. For example, between 80% and 90% of project leaders were satisfied with the transparency and technical soundness of the IGCP project application decision-making process.

14 The IGCP Bureau consists of five members: the Chairperson, the Vice-Chairperson and the Rapporteur of the IGCP Council, the Director-General of UNESCO and the Secretary-General of IUGS (the latter two ex officio).

15 http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/international-geoscience-and-geoparks-programme/statutory-bodies/statutory-bodies-igcp/

16 Statutes of the International Geoscience and Geoparks Programme, see: https://unesdoc.unesco.org/ark:/48223/pf0000260675.

47. IGCP National Committees have an advisory role and represent the programme in 64 countries across all five continents, promoting the programme and international geoscience links, stimulating and endorsing national participation in IGCP proposals and proposing candidates for scientific boards. Typically, they are linked to or affiliated with the national geological survey or other organisation affiliated to the IUGS. While they have no formal role in the programme, according to the Statutes, they appear to perform a key role in linking the programme to national geoscience communities and, as such, act as a node in the international geoscience cooperation network. The 2019 IGCP Annual Report noted that a new initiative was undertaken by the Secretariat to increase connections between IGCP National Committees and UNESCO National Commissions as well as improve outreach to UNESCO Member States. Activity levels vary between National Committees, largely linked to national support (financial or organisational). The network of IGCP National Committees appears to be an important and functioning part of the programme although, according to survey respondents, it does not appear to be the primary route to IGCP awareness.17 The only concern raised was the requirement for IGCP National Committee endorsement of proposals prior to submission to UNESCO. The actual rules as published on the IGCP website and Operational Guidelines differ, so there is understandably some confusion as to the requirements.[18]

3.1.2 UGGp

48. The UGGp architecture consists of four bodies: Bureau, Council, Scientific Board and Secretariat. The stakeholder consultation has not raised any issue related to the functioning of these bodies besides the need to reflect the diversity of the geopark geography into the membership of the UGGp Council. UGGp Council meets once a year and produces a report at the end of the meeting. Since 2019, the Council published the report online, while Bureau reports are not made public.

49. UGGp is by design an international programme with a strong bottom-up, expert-driven character. The UGGp council and bureau consist of individual experts who participate in their expert capacity; their positions do not necessarily align with the position of the countries they are coming from. The UNESCO Executive Board votes on decisions of the council (i.e. on awarding a designation or on a revalidation), which is one of the intergovernmental aspects of the programme. In addition, the role of Member States consisted of drafting the Statutes and Operational Guidelines and adopting them in the General Conference. Member States also have the possibility to propose Council Member candidates. The expert-driven character of the programme has been its main distinguishing feature, identified as a key strength as opposed to other UNESCO programmes such as the IHP and MAB. For instance, stakeholders credit the expert-driven character of the programme as a factor significantly increasing efficiency. The UGGp Secretariat and GGN must navigate between the interests of the Member States (e.g. to have more geoparks approved or not to have applications rejected) and keeping the programme based on solid scientific expertise.

50. Member States adopted different approaches to implement the programme at the national level. Some, but not all, established National Geopark Committees. National Geopark Committees can be created within the organisation in charge of the geoparks in the country (e.g. the UK Committee for UNESCO Global Geoparks is at the British Geological Survey). The responsibility of the national geopark committees is to support the geoparks in the respective country in all aspects of their functioning and operations. Most importantly, they are in charge of coordinating the national applications for UNESCO Global Geopark designation, ensuring high quality applications. Additionally, they maintain databases, adopt a monitoring framework to enhance the value of the geoparks, work with aspiring geoparks before they apply, adopt guidelines, etc. They can also facilitate the evaluation and revalidation missions and promote cooperation between geoparks. Through their membership, the national geopark committees coordinate a wide network of geological, environmental and cultural organisations that embed geoparks into national structures. National Committees are also instrumental in the pre-selection and preparation phase of the designation process. They can perform a strong guiding and coaching role, optimising the chances for success of an aspiring geopark. All these functions of the national geopark committees make them instrumental in the UGGp infrastructure as, in addition to raising the quality of applications, they maintain the high standard of functioning of the geoparks, enhancing visibility and promoting embeddedness amongst a landscape of relevant actors on a national level. Bigger clarity of the role of National Committees and the geopark awareness of this role would be useful for all parties. Good practices of the work of National Geopark Committees should be

17 Only 20% of project leaders responding to the survey reported an IGCP National Committees as the source of their awareness of the programme

18 The website says: "require "a letter of endorsement (if possible) from one of the project leader's National IGCP Committees" while the Operational Guidelines say "Each project leader must include a letter of endorsement from his or her respective IGCP or IUGS National Committee" (see: http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/international-geoscience-programme/proposal-submission/).

actively shared. While the creation of National Geopark Committees should remain voluntary, this should be strongly encouraged and actively supported. The respective roles and responsibilities of national committees and UGGp (and its Secretariat) should be clearly communicated.

51. UNESCO Member States vote on the decisions of the UGGp Council during the UNESCO Executive Board. Interviewed representatives of Member States expressed appreciation for the programme, while underlining the importance of objective criteria and transparent rules. This is understandable as, in case of a problem with a geopark application, the UNESCO Permanent Delegations would be the first to be contacted. Some Member States see the UGGp as a bit Eurocentric, implying the geographical diversity of the programme should be better reflected in the composition of its governing bodies. In addition, the strict separation of the functions of UGGp Secretariat, UGGp Council and GGN seem to be important for the larger buy-in of the UGGp by the Member States and for countering any accusations of bias.

52. One of the main issues with regards to governance is the status of the UGGp as an international programme versus the possible alternative of an intergovernmental programme. As previously mentioned, the expert-driven character of the programme is its specificity and is considered a main strength. It allows operation in an environment relatively free from political interventions and considerations. The evaluation team considers that the programme should remain international as it is now and not become an intergovernmental programme. Transforming the programme into an intergovernmental programme would carry the significant risk of adding a strong political dimension, which may in turn limit its attractiveness and vibrancy and may also impact its legitimacy from a technical and scientific standpoint.

53. This said, the programme must remain candid to the fact that Member States are the key constituents to which UNESCO is meant to cater. As such, provisions to ensure that Member States feel comfortable with the role they play in the governance of the programme and the decisions that are made, should be taken. The programme must also ensure that existing processes and procedures are transparent and robust enough, to generate a sense of trust and confidence within the Member State community. If Member States are confident that decisions are merit- and evidence-based, this can enhance the sustainability of the current governance model and guarantee the continued buy-in of Member States.

3.2 Management and administration of IGGP

54. 54. UNESCO provides the Secretariat for the IGCP and UGGp as per the guidelines of the programme.19 According to the IGGP statues, the work of both sub-programmes shall be coordinated through a shared UNESCO Secretariat and joint coordination meetings of their respective Bureaux, which will convene as necessary. This is happening in practice, as almost all staff work on both sub-programmes.

55. Currently, the IGGP Secretariat comprises approximately 3 Full-time equivalents (FTE), which is quite limited given the scope of the activities it is meant to carry out. For instance, the Secretariat must guarantee that the programme mechanisms are consistent and efficient and that all decisions are taken in an entirely transparent manner. The Secretariats are responsible for all management and administrative support to the Councils to enable them to conduct the project and geopark evaluation process and, for IGCP, to conduct annual reviews of projects in progress as well as for liaising with national committees, for both IGCP and geoparks, and UNESCO national commissions during this process. The Secretariat is meant to provide support to the activities of the governing bodies, including the councils and bureaux of the IGCP and the UGGp. Where IGCP is concerned, the Secretariat also promotes the programme internationally and raises and manages external sources of funding for the programme.

56. The Secretariat is also involved in promotion and capacity building activities for UGGp. The evaluation evidence from the surveys and interviews demonstrated that the performance of the IGGP Secretariat is highly satisfactory and that it is well-regarded by programme stakeholders, especially given the strong resource constraints it faces.

19 UNESCO shall act as the Secretariat for UNESCO Global Geoparks and be responsible for its functioning and promotion. The UNESCO Secretariat shall manage the applications process of aspiring UNESCO Global Geoparks and the revalidation process of existing UNESCO Global Geoparks. The UNESCO Secretariat shall liaise with IUGS and other organizations, as appropriate, to obtain independent, desk-top scientific assessments. The UNESCO Secretariat shall liaise with GGN and other organizations, as appropriate, to obtain independent, field evaluations. The UNESCO Secretariat shall prepare the agenda and the documentation of the Bureau and Council meetings and shall ensure follow up to their recommendations, including preparing the appropriate documents for meetings of UNESCO's Executive Board as outlined in Sections 4 and 5. The UNESCO Secretariat shall liaise with individual UNESCO Global Geoparks to facilitate activities towards sustainable development and international cooperation. The UNESCO Secretariat shall keep UNESCO Global Geoparks, Member States, National Commissions for UNESCO, National Geopark Committees and the public informed of the activities of UNESCO Global Geoparks, individually and as a network, focusing on best practice with regard to UNESCO's objectives. This will include updating a list of UNESCO Global Geoparks published on the UNESCO website and regular reporting to the UNESCO governing bodies.

It is worth noting that important efforts have been carried out in the last two years, by the Secretariat, to improve programme management and strengthen, clarify, update and improve the overall processes for running the programme. This is illustrated, for instance, by the recent development of a UGGp evaluation checklist as well as the decision to publish the UGGp aspiring geopark evaluation reports since 2019. For IGCP, the Secretariat implemented checklists for project proposals to aid the evaluation process and improved annual report templates including, for example, key UNESCO targets on gender and developing country participation. In addition, extensive work has been carried out by the Secretariat to build capacity (e.g. training in Lesbos), improve evaluation criteria to select evaluators and draft FAQs and templates for Management Plans.

57. Another particularity of the IGGP is the sharing of Secretariat roles and responsibilities with its key partner institutions: the IUGS and the GGN. In the case of the latter, important support is provided by the regional geopark networks and national geopark committees. For instance, the UGGp secretariat at UNESCO shares the responsibility of maintaining the roster of evaluators in charge of carrying out initial geopark application assessments as well as revalidation procedures.

58. The distribution of work among the UNESCO-hosted IGGP Secretariat and both partner organisations is well-balanced and favours an efficient implementation of the different shared responsibilities. This division of labour not only reduces the burden of work for the IGGP Secretariat but it also allows leveraging the expertise and network of these partners when it comes to the delivery of the Programme.

59. While the collaborations with IUGS and GGN are key to the continued survival of the Programme and its efficient roll-out, there is room for improvement in the communication of the roles and responsibilities of both organisations in the delivery of the programme, particularly where UGGp is concerned. For instance, the statutes of the programme currently leave room for interpretation in terms of who is responsible for designating evaluators and on what basis. In addition, the role of the UGGp Secretariat vs. that of the GGN is not always fully clear to stakeholders when it comes to supporting new applications, including the identification of new aspiring geoparks, and the delivery of technical support and guidance to these geoparks in order for them to develop eligible and robust applications. Stakeholders usually perceive GGN as an organisation with great real and symbolic power and influence in the context of the UGGp. While this situation is acceptable given the history and the financial set-up of the programme, there is still a need to introduce a clear demarcation between the functions of the UGGp Secretariat and GGN whenever clarity is missing, which is to be communicated externally. This will increase the efficiency of the programme and prevent confusion among geoparks and other stakeholders.

60. Finally, a key limitation of such a small team is that there is little potential for economies of scale or scope within or across the two components of IGGP. Individual team members conduct all tasks required to manage a scientific research programme and a UNESCO certification programme and therefore they are not able to conduct all tasks or make improvements that they would like to. From an evaluation perspective, this was evident in the lack of coordinated sources of data on programme activities and outputs. Much of these data exist but are not collated or readily accessible due to resource constraints.

3.3 The quality of selection criteria and procedures of the IGGP

3.3.1 IGCP

61. IGCP holds an annual call for proposals with proposals reviewed and prioritised at the Annual IGCP Council meeting in February each year. Calls are in line with the IGCP's objectives with specific topics or themes agreed for each year's call at the prior Council Annual meeting. IGCP publishes clear information and guidelines for proposal submission both on its website and in its Operational Guidelines.20

62. Council and Scientific Board members review and score 'offline'. The Secretariat collates scores presented to the Council at the IGCP Annual Council Meeting in February each year. At this meeting, the Council reviews the proposals and selects projects for funding. Selection is entirely based on scientific merit and alignment with the IGCP objectives plus any eligibility criteria for the proposals[21] and the Council does not know the available budget in advance. Annually, the Council reviews projects already funded based on the content of their annual reports. The IGCP Council submits a composite prioritised list of the projects to the Secretariat, with the final

20 IGCP Operational guidelines: http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/IGCP-OperationalGuidelines-March2016.pdf http://www.unesco.org/new/en/natural-sciences/environment/earth-sciences/international-geoscience-programme/proposal-submission/

21 There are two types of projects with slightly different criteria, over and above the requirements for scientific excellence and alignment with the IGCP objectives - 'regular' projects and young scientist projects.

allocation of available funds to individual projects, both new and existing, determined collaboratively by the IGCP Bureau. Therefore, the actual amount of funding provided annually to IGCP projects reflects the collective decision of UNESCO and IUGS. The decisions made on funding projects are made public via the IGCP Annual Report.

63. The annual programme budget is distributed amongst new and existing projects based on a formula that allocates more funding to higher scoring projects. Total annual funding is of the order of US$ 150-200k, resulting in funding of US$ 5-8k per project, with payments made by the IUGS Treasurer, the Secretariat or their respective UNESCO Field Offices as appropriate once approved by the Secretariat.22

64. These IGCP processes, and the governance arrangements that underpin them, follow standard international best practice for managing research funding programmes refined over many years. The evaluation evidence revealed no major concerns with the project review or selection process. Over 80% of project leaders who responded to the survey considered the process technically sound and transparent (although fewer people responded to the issue of transparency). A similar proportion were satisfied with the clarity of information and the ease and timeliness of the process. One interviewee reported that they received practical and useful feedback from the ICGP Council on an unsuccessful proposal that enabled them to improve it and achieve funding the following year.

3.3.2 UGGp

65. The process for UNESCO Global Geopark designation may vary slightly between countries. Nevertheless, the main stages are shown in the following figure, for the purpose of this evaluation. Given the importance of the geopark evaluation and designation process, the evaluation has addressed a specific set of issues related to the process in the following sub-sections of the report.

22 Payments are described in this way in the IGCP Operational Guidelines, although the IGCP 2018 Annual report says that all payments are made via IUGS.

Figure 3 UNESCO Global Geopark designation process

3.3.2.1 The identification of aspiring geoparks

66. After the preparation of an area as a de facto Geopark (according to the statutes, it must be a de facto Geopark for one year before applying), the application process starts with an Expression of Interest (EoI). These EoIs are often sent to the National Geoparks Committees and / or the UNESCO National Commissions. It is also possible for these institutions to reach out to sites / protected areas / communities indicating their potential to become a UGGp. Once the EoI is a fact, National Geoparks Committees provide feedback to the aspiring territory concerning its geological merits. In the absence of a National Geoparks Committee, this feedback may come from a UNESCO National Commission, a Ministry or a geological research institute. The honest feedback on the national level is extremely important as it can filter the territories with real potential and give them additional motivation. Inversely, it can dissuade territories that would not be up to the quality level of a UGG.

67. The box below presents a concrete example of the designation process in the UK, of high transparency and use to aspiring geoparks.

Box 1 Process for national quality control of geopark designation in the UK

UK has a rigorous designation process in place for new UNESCO Global Geoparks before submission for international evaluation. This ensures that only aspiring Geoparks that meet the UK's high standards are submitted to UNESCO. This process is overseen by the UK Committee for UNESCO Global Geoparks (UKCUGG), including a technical and scientific evaluation and on-site evaluation, followed by advice and feedback.

- **Step 1: Any aspiring area in the UK engages in a dialogue with UKCUGG;**
- **Step 2: Representatives of the area are invited to present their ideas and learn about the network;**
- **Step 3: Aspirant UGG submits an Expression of Interest;**
- **Step 4: Aspiring areas obtain guidance by UKCUGG through an on-site visit;**
- **Step 5: Draft full application dossier submitted to the UKCUGG for consideration;**
- **Step 6: Decision if the dossier is ready to be formally submitted to the UK National Commission for UNESCO or needs improvement.**

Source: UK Committee for UNESCO Global Geoparks

68. If a territory is given a preliminary 'green' light to proceed with its application, a preparation stage follows during which aspiring geoparks aim to reach the UGG standards and prepare for the evaluation. During this period, they can receive support in several ways. The recently launched Mentoring and Knowledge Exchange Programme (by the UGGp Secretariat), whereby successful geoparks mentor aspiring ones, is a positive initiative and should be continued with a more intensive focus on countries from Africa, Arab States and Latin America. Geoparks can turn to the national or regional geoparks networks and the GGN for support. It is worth noting that the preparation stage brings a number of benefits. Recently designated geoparks report that the preparation stage highly beneficial to their communities, as it brought together different stakeholders strengthening community vitality and cooperation. As the value of concrete examples is high, besides the mentoring programme, aspiring geoparks should be encouraged to visit as many well-functioning geoparks as possible. The duration of the preparation stage varies significantly. It could be 1-2 years or, in some cases, such as for the recently approved Discovery Geopark in Canada (not yet formally voted on by the UNESCO Executive Board), 12 years of preparation.

69. The design of the evaluation process allows only mature applications to reach the evaluation stage. Given the high level of costs associated with the preparation and the evaluation of dossiers, filtering out non-mature applications at an early stage makes sense. As described earlier in the text, suitable and professional support on the national level, provided by National Geopark Committees, UNESCO National Commissions, the UNESCO Field Offices and the national or regional geopark networks could increase this maturity significantly.

3.3.2.2 The selection of external evaluators and evaluation visits / reports

70. According to the Statutes of IGGP, geoparks are to be evaluated during the initial application and subsequent revalidation by a team of two independent experts. Geological aspects of the applications are evaluated by IUGS, which created a commission for this task. This evaluation is mainly carried out via a field mission to the aspiring geopark and on the basis of a dossier and a self-assessment previously prepared by the aspiring geoparks. Numerous stakeholders expressed the thought that, until several years ago, these evaluations lacked consistency in terms of quality. This was sometimes related to the differing skills and expertise of the evaluators, as well as to the fact that evaluation criteria and report structures were unclear. Stakeholders now report an improvement in the quality of the evaluations as a result of evaluator training and additional efforts implemented by the Secretariat to better define evaluation procedures and criteria (e.g. use of the evaluation checklist).[23] These efforts are on the right track and they should continue until a quality of excellence is attained. The decision to have teams of one senior and one junior evaluator is also very positive, as the senior evaluator will be able to pass his / her knowledge and attitude to the junior evaluator. The fact that all evaluation and revalidation reports will be public is seen as increasing the transparency of the entire procedure and is expected to act as an additional incentive for the programme and individual evaluators to consistently produce high-quality reports.

23 The evaluation team was unable to verify this gradual improvement in the quality of the reports, given that the programme was unable to produce the evaluation reports of geoparks selected before 2018.

71. The Secretariat, together with the GGN, maintains a roster of evaluators to carry out evaluations of aspiring geoparks and revalidations. A 'Call for Applications for the Roster of Evaluators for UGG' is published regularly on the basis of need. The criteria for becoming an evaluator are relatively restrictive and require significant current or previous experience with a UNESCO Global Geopark in the capacity of a manager, geoscientist or a member of the scientific committee. The use of such restrictive criteria may exclude additional high-level and knowledgeable experts who could also serve as good evaluators. Further, given that UGG projects are not only about the geological significance of a site, it is important that the evaluators have a good understanding of the non-geological aspects of a UGG, such as the link to tourism development, local economic development, gender, etc. As such, the UGG could also consider expanding its roster of experts to include additional expertise not directly related to geopark development and geological sciences.

72. Evaluators are not excluded from sitting on the UGGp Council or Bureau, which is responsible for assessing evaluations and providing approvals for geopark creation / re-validation, based on the recommendations made by evaluators. Even if the programme has made a habit of asking council members who have been involved in the evaluation of certain geoparks to 'leave the room' when such aspiring geopark evaluations are discussed at council meetings, avoiding such overlapping roles would increase external perceptions regarding the transparency of the selection process, as well as the absence of potential conflicts of interest. Therefore, the decision taken at the last council in Lombok to gradually phase out this system is appropriate and should be implemented sooner rather than later, together with capacity building for future evaluators. In addition to this, the GGN may wish to adopt a policy limiting the possibility of GGN members to act as evaluators. This could help avoid the emergence of any doubts regarding whether GGN interests influence the evaluation process.

73. The selection of evaluators for missions is conducted by the Bureau with the support of the Secretariat. It's crucial that the selection of evaluators is carried out and overseen by the programme and not by GGN, even if GGN is able to provide access to a network of potential evaluators. According to the Secretariat, the matching is made on the basis of geological expertise and knowledge of languages and regional context. However, the rationale behind the selection of evaluators for certain missions is not always clear to geoparks, and the selection process lacks transparency as well as better defined criteria / weighting systems. As a response to this drawback, it is worth mentioning that improved, clearer selection criteria have already been drafted in addition to evaluation processes for evaluating the performance of evaluators. Special care should be taken to communicate these positive developments to concerned stakeholders. It has to be noted that the process of selection is labour-intensive and will become even more so with the future growth of the geopark community.

74. From an aspiring geopark perspective, the perception of the quality and relevance of selected experts in charge of conducting their evaluation visits is generally high. In a number of cases, geoparks particularly appreciated the fact that evaluators spoke the local language and remained flexible when it came to the application of the evaluation criteria in the specific contexts of the geoparks they were evaluating.

3.3.2.3 The soundness and clarity of the evaluation criteria

75. The criteria for becoming an UNESCO Global Geopark are described in the Statues of the IGGP, Annex II (Draft Proposed Operational Guidelines for UNESCO Global Geoparks). The international significance of the geological heritage of each new geopark is to be evaluated by IUGS on the basis of 'specific and publicly available scientific criteria'. The concept of international significance is rightfully used as it is inclusive as opposed to outstanding universal value, which is exclusive. The significance of the geological heritage should be interpreted widely in the context of local population and cultural heritage. It is worth noting that the availability of scientific publications on one site is not a proof that it is better than another. The evaluation team believes that the work to further clarify and define the term 'international significance' should continue and the recently shared IUGS guidelines are a step in the right direction.

76. A number of consulted stakeholders voiced concern with regards to the consistency of application of the criteria and the sometimes high degree of subjectivity. Germany authored a 'non-paper' describing these inconsistencies and proposing a methodology to address them. Other stakeholders also reiterated their belief that criteria and their interpretation should be made clearer up-front and should not leave room for potential subjective decisions. The evaluation team agreed that the legitimacy of the programme and its bottom-up, expert-based character will benefit tremendously if an in-depth review of criteria, interpretation and application and evaluation forms is carried out as soon as possible, in light of developing a more robust evaluation framework.

77. In the table below, we provide a very brief overview of the criteria that, in our opinion, require further clarification and formalisation. It is compiled on the basis of interviews, surveys, case studies and the non-paper, and include the issues that were often mentioned.

Table 2 UGGp criteria which require attention and clarification

Criteria	Comments
Geology of international significance	Recent IUGS guidelines are a positive step and need to be widely consulted. The question of how unique / special a geosite should be deserves specific attention. The approach should be very clear especially given the temptation (with good reason) to use the programme for poverty alleviation ends.
Protection of defining sites	Defining sites should be effectively protected including visual impact. The conditions on sale and trade of geological objects should become very specific.
Visibility	The term should be defined precisely as its interpretation could be very subjective. The weight of the criteria should also be defined.
Encouragement to share experience within GGN	Stakeholders should have clarity to what extent sharing experiences and cooperation activities are voluntary and, if failing to do so, decreases the probability for revalidation. While this aspect is at the heart of the UGGp, it could be easily misinterpreted.

78. As the above criteria are complex and sometimes controversial, the evaluation was not in a position to study all dissenting views and come up with an opinion defending one view or another. Developing concrete suggestions as to how such criteria could be further clarified or strengthened is also outside of the scope of this evaluation. However, we believe that there is sufficient evidence supporting the need to conduct a systematic, in-depth review of the criteria in order to further reduce the subjective character of the selection to a realistic minimum and ensure they meet the standards of such an important international programme. While we believe that full objectivity of the decisions taken is not always feasible, there is a significant margin for improvement of the criteria and their interpretation.

79. To do so, the UGGp requires efforts to solve pending issues and inconsistencies. The precise form / tool for doing that is of little importance as soon as its effectiveness is guaranteed. Efforts should be made in terms of updating and upgrading the current rules, adopting new rules, updating and streamlining the documents, etc. The goal of the revision would be to increase the transparency and credibility of the programme. The evaluation team puts forward this suggestion, while being aware of the resource limitations the programme is facing, as well as the potential burden of doing so. The evaluation team believes, however, that doing so would represent a significant investment for the programme, which is likely to lead to improvements which would ensure its sustainability and further improve its reputation as a programme of excellence.

80. In comparison with other UNESCO designations, the UGGp one is associated with a rigorous revalidation process taking place every four years. It is meant to maintain the high quality of the designation and to keep the momentum for the geoparks, which could potentially decrease after a successful evaluation. The revalidation process has been assessed as transparent and the results are very similar to the transparency of the designation process. There are concerns that the revalidation cycle is too short, and suggestions have been made to increase it to five years.

3.3.2.4 The soundness and clarity of the evaluation procedure

81. In addition, the technical and scientific soundness of the evaluation and designation process (including the evaluation missions) have been assessed as excellent or good by three quarters of the on-line survey respondents. One very positive aspect of the evaluation process is that it is not considered a top-down inspection, but rather a process of learning and knowledge exchange. Geoparks often considered having gone through the evaluation process to have provided many valuable lessons and insights as to how their project could be further strengthened. Almost 90% of the geoparks improved the quality of the geoparks following the evaluation and revalidation missions. This is a cultural feature of the programme that should continue to be nurtured and developed.

82. Despite the overall perception of the process as professional and scientifically robust, certain geoparks consider that there is a certain level of overlapping information in Form A and Form B. Additionally, the objectivity of the scoring system in Form B is questionable to some geoparks and there is no clarity on how the scoring of

individual criteria is done and the threshold under which a geopark could potentially get a yellow card.

83. We would also like to highlight the issue of giving green cards with recommendations and the need to clarify to what extent these recommendations are mandatory to the geopark. The precise level of points under which a yellow card is issued should also be very clear. It is worth noting that, while for certain geoparks a yellow card is an excellent opportunity for improvement and further development, for other geoparks this could mean a negative assessment of the geopark and might lead to the dismissal of the director. Therefore, the grounds for issuing a yellow card should always be very clear and the decision for it should be supported by a body of robust and objective data.

84. Despite the positive feedback on the soundness and clarity of the designation procedure, there seems to be a need for better communication of the procedure on the UGGp and GGN websites. It is worth mentioning that in order to address this caveat, the Secretariat has drafted a checklist consisting of 101 questions providing guidance to aspiring UGGp, together with an explanatory note with concrete examples and templates, which, as of January 2020, are in their final stage before publication.

3.3.2.5 The length and cost of the evaluation process for aspiring geoparks

85. Around 70% of the geopark respondents consider the timeliness and simplicity of the evaluation process as good or excellent, while around 25% of the respondents view it as acceptable. Nevertheless, it has to be noted that the period between the initial submission of the application and the final designation through voting by the Executive Board is often perceived as being overly long and may potentially act as a counterincentive to seek validation. As such, realistic options could be explored for shortening of the entire process. If this is not possible, the reasons for having a relatively long process of application should be carefully communicated to the aspiring geoparks. The waiting period is perceived as a period of insecurity for local stakeholders who engaged with the process.

86. No major issues have been flagged with regards to the costs of the evaluation process as geoparks are generally aware of the potential costs and are willing to cover them in light of the expected benefits. More than half of the respondents from geoparks (53%) think that the overall benefits of the UNESCO Global Geopark designation exceed their costs. Some 28% consider the benefits as proportionate to the costs. Some 14% respondents think that the costs exceed the benefits, while only 1% (i.e. 1 geopark) considered that costs significantly exceed the benefits. Half of the respondents from national geopark committees and UNESCO national commissions consider that benefits exceed costs and some 44% think that benefits are proportionate to costs. Only 6% think that costs exceed benefits. It is worth noting that the judgement on the cost / benefit ratio does not seem to be based on rigorous calculations but on an overall perception of the potential benefits.

87. It is impossible to know whether the cost of the process has kept any potential geoparks form engaging in the certification process (i.e. cost of certification acting as a barrier to participation in the programme). In light of reducing the costs of evaluations and ensuring that evaluators are provided equal treatment by the aspiring geoparks, the programme may want to envisage issuing guidelines on the travel costs and conditions to be provided to evaluators. Reference should be made to the existing Code of Conduct when it comes to providing gifts or purchasing business class flights. One additional concrete measure to decrease the cost of the evaluation missions would be to know the names of the evaluators and the timing of the evaluations as early as possible in order to book travel well in advance and at a lower cost.

3.3.2.6 The transparency of the evaluation process and results

88. Overall, the transparency of the UGG designation process has been assessed as excellent or good by more than 80% of the respondents and acceptable by about 15%. About 5% of the respondents have a negative opinion with regards to the transparency of the process. One of the main comments relevant to the transparency of the process (discussed previously) concerns the appointment of evaluators. The transparency of the designation process is closely linked to the transparency and soundness of the selection criteria and the consistency of their interpretation and application, an issue discussed in Section 3.3.2.3. The perception of transparency is also influenced by the quality of the evaluators and the process of their selection, addressed in Section 3.3.2.2.

89. The transparency of the process and the fairness of the council decisions can also be improved if evaluators have sufficient time to write their reports and council

members receive the reports sufficiently in advance to develop an informed opinion. The fact that the last stages of the process take place in (Northern Hemisphere) summer means that holiday season in some world regions needs to be taken into consideration. It seems that, in some cases, the decisions of the council are not strictly aligned with the recommendations of the evaluators. In practice, this can be corrected by allowing for enough time for council members to ask questions to the evaluators and potentially ask for additional clarifications.

90. The evaluation team believes that the decision to publish the evaluation and revalidation reports is very positive and will lead to improvements in quality and transparency. The quality of the evaluation reports is instrumental to the fairness of the council decisions. As per the Statutes and the Operational Guidelines of the IGGP, geoparks which are rejected or deferred do not have the possibility to appeal the decisions or provide additional evidence regarding the deficiencies or weaknesses identified by the council. At the same time, Member States can attend the Council meeting and witness the process. As adopting a formal appeal mechanism risks paralysing the process, additional strategies should be explored to further strengthen the robustness of selection and evaluation systems as well as the quality and consistency of each council decision.

91. The possibility of having a representative from the National Geopark Committee participate in the field evaluation is a good practice to ensure fairness, transparency, communication and quality standards. Evaluators reported receiving sufficient guidance from the UGGp Secretariat when it comes to their roles and responsibilities.

3.4 Involvement of UNESCO system of actors in IGGP implementation

92. As in the case of the majority of UNESCO programmes and initiatives, delivery of activities is meant to be strengthened by the local presence of UNESCO in Member States and regions. This is meant to happen thanks to the support of UNESCO Field Offices as well as through the constellation of UNESCO Chairs and Category II Centres. UNESCO National Commissions hosted by Member State government administrations are often important enablers of programme and project delivery.

93. In the case of the IGGP, there is some level of involvement with both UNESCO Professorial Chairs and Category II centres. The IGCP programme manager (who is a geoscientist by background) works closely with the UNESCO Chair in Geoscience and Society (University of Plymouth, UK) and the UNESCO Chair for Ophiolites Study (Sultan Qaboos University, Earth Science Research Centre, Oman), the latter of which is also an IGCP Council Member. The programme manager also collaborates with the three Category II Centres in geoscience (all in China)24 on a fairly regular basis and these centres also participate in relevant IGCP projects. The Category II centre 'International Research Centre on Karst (IRCK)' was created as a result (in part) of prior IGCP projects and continues to be a key participant in relevant projects such as the current project IGCP-661 The Critical Zone in Karst Systems. There are 17 UNESCO Chairs in Earth Sciences and so there may be additional opportunities to increase or build links between them and IGGP. For example, the Chair on Coastal and Continental Shelf Geoscience (Universidad de la República, Uruguay) or the Chair on Geoparks, Regional Sustainable Development and Healthy Lifestyles (The University of Trás-os-Montes e Alto Douro) might represent potential avenues for the development of synergies. UNESCO also launched a chair on gender and disaster risk reduction, which could help further enhance the gender dimension of the IGGP.

94. The involvement of UNESCO Field Offices varies. For example, the Montevideo office in Uruguay, which acts as the focal point for UNESCO's Natural Science Sector for Latin America and the Caribbean, actively promotes the UGGp in the region. Another example comes from the Jakarta Office, which during 2017-2019 successfully implemented a regional UGGp capacity building programme funded through Japan Funds-in-Trust, specifically designed to enhance the capacity and engagement with the programme among National Commissions, Geoparks Committees as well as UNESCO Field staff in Asia and the Pacific. When interviewed, however, the same office indicated not being at all involved in the delivery of IGCP. The lack of additional resources, as well as the lack of specific knowledge and skills in the field of geoscience within Field Offices, are seen to be key constraining factors to further involvement of such offices in the delivery of the IGGP. The view from some field offices is that delivery of the Programme continues to be too centralised at UNESCO Headquarters, and that Field Offices could be further empowered by UNESCO Headquarters in the delivery of the Programme. From an evaluator's perspective, the description of the role of Field Offices in the delivery of IGCP can be significantly improved.

24 International Research Centre on Karst (IRCK; the International Centre on Global-scale Geochemistry; and the International Centre on Space Technologies for Natural and Cultural Heritage (HIST).

95. The relatively limited involvement of Field Offices as well as UNESCO Category II Centres and Institutes and Chairs is a missed opportunity to strengthen the local visibility and presence of the IGGP. Given the bottom-up nature of the Programme, Field Offices would be in a privileged position to relay information and knowledge on the programmes to local stakeholders, as well as to support the development of a robust pipeline of future projects and geoparks. Nevertheless, this would add additional work to an already stretched Secretariat.

3.5 Value for money of IGCP grants

96. The question on value for money can be interpreted on two levels:

    - Overall costs related to developing and managing the IGCP compared to programme funding (a delivery efficiency);
    - Overall costs related to developing and managing the IGCP compared to overall benefits (a wider cost-benefit).

97. The IGCP running costs comprise of UNESCO staff (approximately 1.5 FTEs) plus the direct costs to support the Council and Bureau (i.e. mainly travel and subsistence costs) and other sundry costs.25 There are also the unfunded resources (time costs) of the Council and Scientific Boards to carry out their tasks and the proposal review tasks in particular. The level of resources is considerable, but these types of activities are 'part of the job' of being a researcher and, therefore, while being acknowledged and valued, are not typically taken into account when assessing value for money of research programmes. The total programme grant budget varies between US$ 150-200k per year.

98. The costs of 1.5 FTEs (salary and UNESCO overheads) plus the direct costs to support the Council and Bureau could be estimated to be of the order of 40-50% of the programme budget. This is high compared to typical levels of programme management costs of 5-10% of programme budgets. But two important caveats should be noted: firstly, 'typical' programmes are many US$ millions in budget and IGCP is significantly smaller and, as noted in Section 3.2, there are no economies of scale when the whole gamut of programme management activities are needed even if the programme grant funding is small. Taking into account the wide range of core tasks required to run IGCP, or any comparable research programme, delivering it with 1.5 FTE is a challenge. Secondly, a full view of value for money would include project funding leveraged from national and other sources, and not just the relatively small 'seed funding' provided by UNESCO, and this would lead to a much higher value for money figure that would be closer to 2.5% (see Section 3.7.1).

25 In 2019 costs to support the Council were US 9,827, 6.6% of the total IGCP budget of US$149,327, with the latter including UNESCO and IUGS funding but excluding UNESCO staff costs.

3.6 Value for money of geopark contribution to GGN / UGGp

99. Some 82% of the geoparks consider the burden of the annual contribution to GGN / UGGp as average (63%), low (14%) or very low (5%). The burden of the contribution is perceived as high (14%) or very high (5%) by slightly less than one fifth of the geoparks. These figures correlate with the perceived value for money of geopark contributions to GGN / UGGp: it is considered very high (10%), high (29%) or average (46%) by 86% of the respondents while 14% of the respondents consider it low (13%) or very low (1%).

100. More than 80% of the geoparks have assessed the GGN support, which is financed through their contributions, as useful and very useful. Around one fifth of the respondents see GGN support of limited (18%) or no use (1%). Some 83% of the national committees and national commissions have assessed GGN support as very useful (33%) or useful (50%). The remaining 17% believe it is of limited use. Most respondents believe that this is a good and reasonable investment to keep the network alive and to assure the quality of the UGG label. However, there is a perception that the accountability of spending of this contribution (both the GGN and the UGGp Secretariat part) could be improved. Oftentimes, geoparks have limited visibility over how this money is invested and who is in charge of doing so. On top of this contribution, geoparks are often also expected to provide a financial contribution to regional geopark networks.

3.7 Financial leverage of the IGGP

101. Given the lack of consolidated data regarding the extrabudgetary resources allocated to the Programme, it is difficult to estimate its financial leverage effect at the central level. This said, given the cooperative nature of the Programme as well as the limited regular programme resources being allocated by UNESCO to the IGGP, the financial leverage effect of the IGGP as a whole is found to be high.

3.7.1 IGCP

102. The resources assigned to IGCP come from UNESCO's regular programme and from donors, in particular the International Union of Geological Sciences (IUGS), the Jeju Province Development Corporation (JPDC) of the Republic of Korea and the UNESCO National Commission for the People's Republic of China. In the past, the programme also received considerable support from the United Kingdom, the United States and Sweden through Sida. The proportion of the resources allocated to IGCP that come from donors varied between 40- 80% of the total annual budget in the period 2012-2015,[26] which in practice is an important contribution to continue the programme.

103. At a project level, the resources allocated to IGCP projects, from 2012 to 2018, have ranged from US$ 5,900 to US$ 6,800. IGCP is designed in this way, providing 'seed' money to fund activities that directly support international cooperation and collaboration, so being mainly allocated to travel to workshops, seminars and project meetings. Furthermore, IGCP funding is only allocated to scientists from developing countries to directly support knowledge transfer and geoscience capacity building in these countries. The project research work is funded from researchers own resources, be that core institutional funding that pays their salaries or national and other international research grant funding. With an average number of five project leaders per project (ranging between 3 and 14) and a project lifetime of five years, considerable resources are allocated to IGCP projects.

104. The UNESCO IGCP label is instrumental in leveraging additional research resources in terms of applying for additional grants or gaining internal approval, where required, to commit staff time to IGCP project work. Just over 50% of project leaders reported that achieving UNESCO IGCP funding (and the UNESCO endorsement that accompanies the funding) was either critical to gaining (24%) or significantly increased the level (30%) of national / international funding for their project. Furthermore, 41% believe the project would not have gone ahead without IGCP funding, a further 52% believe the project would have been smaller in scale or would not have involved them as individuals, while only 13% believe it would have happened in its totality without IGCP support.

105. It is challenging to estimate leveraged funding as different types of research institutions in different Member States calculate, and think about costs, differently. Some researchers are fully aware of full economic costing approaches to research activities and others are only aware of additional direct costs. This disparity in approaches is reflected in the responses to a survey question to estimate the total funding of their IGCP projects (excluding IGCP funding). Estimates range from a few US$ 10,000s to US$ 5M. 'Several millions' was also quoted in one of the case studies. Even taking a relatively low estimate of US$ 250k per project per year27 and 15 IGCP projects (another low estimate based on numbers in the last few years) would lead to a total figure for non-UNESCO funding of US$ 3.75M and a leverage effect of between 20 and 25 times the UNESCO funding (taking a range from US$ 150-200k per year). This is a conservative estimate, not only for the reasons described, but also as it does not include the contributions of all participants beyond the project leaders.

3.7.2 UGGp

106. UGGp is a programme largely based on voluntary efforts and contributions made by either UGGp partners or geoparks themselves. Overall, the level of financial resources that go into the implementation of the programme is low compared to the overall impact of the programme. Given the amount of work that is triggered by the very small and modest budget of the UGGp, the financial leverage effect of the programme, as well as its 'bang-for-buck', are high.

26 IGCP Council Reports

27 A figure that falls within the bounds of figures quoted and represents a relatively low figure for salary plus overheads of a principal investigator in Europe or the USA. We arrived at US 250k a year based on US 50k person per year for 5 project leaders. The US 50K per person year is based on 50% full economic costs (FEC) of US 100k person for one year or a project (therefore assuming the Project Leader gives 50% of their time to the IGCP project). US 100k FEC is a relatively low figure for salary plus overheads of a principal investigator in Europe or the USA.

107. The leverage effect of the UGGp can be analysed at two levels: at the central programme level and at the individual geopark level. At the central programme level, the financial leverage effect of the UGG is high given the contributions (in-kind and financial) made by key strategic partners in the delivery of the programme. For example, annual council meetings are organised and financed to a large extent by regional geopark networks. From a formal perspective, the UGGp budget (i.e. inputs) is extremely modest and limited to the cost of UNESCO staff as well as to the share of geopark contributions, which are channelled to UNESCO (ca. US$ 150k per year). In practice, however, the programme inputs are much higher given the resources injected by the GGN, regional geopark networks and national geopark committees into the implementation of programme activities. It's worth noting that the great majority of UGGp governance body members, as well as evaluators, dedicate their time to the programme on a pro-bono basis. From an institutional perspective, the UGGp brings significant benefits to UNESCO in terms of visibility and exposure, given the very limited amount of resources that it allocates to the delivery of the programme.

108. At the geopark level, the financial leverage effect of the UGGp is also high. This is mainly illustrated by the fact that the geoparks do not benefit from any type of financial support provided by the programme. As such, the programme is generating investments on behalf of a wide array of local stakeholders (i.e. universities, local governments, local community members) in support of geopark designation and operation, solely through the incentive of providing the UGGp recognition and label.

109. On top of this, the geopark designation also appears to have a direct effect on the geoparks' (and the respective managing authorities') capacity to tap into additional sources of financing. According to more than 70% of survey respondents, obtaining the UGGp designation has a direct impact on their capacity to raise additional funding from external sources. For example, TERRA.vita UGG recently applied successfully for EUR 1.65 M INTERREG VA funding together with the UGGp De Hondsrug in the Netherlands to improve the added value of the UNESCO designation in both Geoparks. Other European geoparks reported having received subsidies from the European Structural and Investment Funds. These are particularly suitable for European geoparks, as these geoparks comply with ESIF priorities on sustainable development, climate change mitigation and adaptation and territorial cohesion.

110. As mentioned previously, a very significant share of the UGGp-related activities are based on voluntary contributions. It is close to impossible to track the size of these contributions but evidence of their significance is overwhelming. In the first place, these contributions are associated with the development and running of the geoparks, including from local NGOs, citizens and businesses. Secondly, the experts involved in the UGGp Council and Bureaux also donate their time free of charge. The same is valid for the evaluators. A rough calculation demonstrates that around 800 evaluation and revalidation missions have been conducted until now without counting the council meetings. Each of them involves two persons and lasts about 10 days, which represents 16,000 working days of voluntary expert work. One category of voluntary contributions is scientific work associated with the park. These can be donated from universities, national or regional scientific institutes. This is a win-win situation as scientists benefit from the geology-related work associated with the geopark development.

111. The other UNESCO designations do not involve such an intensity of the voluntary work, hence UGGp is an outlier in the UNESCO system. It is worth noting that many of the interviewed stakeholders pride themselves on their involvement in a system relying to a large extent on voluntary contributions. The perception is that this gives a big part of the vibrancy and passion of the programme and hence should not be discontinued.

3.8 Quality of programme monitoring and evaluation system

112. The IGGP does not have a monitoring and evaluation system. The programme lacks a Theory of Change as well as an accompanying results framework allowing measurement of results generated by the Programme in line with original intended ambitions. This represents a major weakness of the Programme, both in terms of accountability, as well as in terms of effective steering and management.

113. The closest thing the Programme has to a results framework are the performance indicators and targets established under the 39 C/5 (2018-2019), relating to the Major Lines of Action and Expected Results which cover the IGGP. These indicators are presented in the following table:

Table 3 39 C/5 performance indicators relating to the IGGP

Expected Results for MLA II	Performance Indicator	Targets[28]
Expected result 4: Member States have strengthened management of both geological resources and geohazards risk towards the achievement of related Sustainable Development Goals (SDGs) and targets	Number of supported Member States which have strengthened national geoscience capacity in a gender- responsive manner	– 125 of which 35 in Africa and 5 SIDS*
Expected result 4: Member States have strengthened management of both geological resources and geohazards risk towards the achievement of related Sustainable Development Goals (SDGs) and targets	Number of Member States which have new UNESCO Global Geoparks	– 14 of which 2 in Africa
Expected result 4: Member States have strengthened management of both geological resources and geohazards risk towards the achievement of related Sustainable Development Goals (SDGs) and targets	Number of supported African Member States with increased education, research and training in geoscience through the African Network of Earth Science Institutions	40
Expected result 6: Member States have developed UNESCO-designated sites as learning sites for inclusive and comprehensive approaches to environmental, economic and social aspects of sustainable development	Number of Member States which have effectively used UNESCO- designated sites as demonstration sites for sustainable development solutions including green and inclusive economies that respond to the needs of vulnerable groups and support gender equality	– 130 using BR and UNESCO Global Geoparks of which 7 in Africa and 5 SIDS* – 75% of all BR are dedicated to sustainable development – 37 having UNESCO Global Geoparks of which 1 in Africa and 1 SIDS*
Expected result 6: Member States have developed UNESCO-designated sites as learning sites for inclusive and comprehensive approaches to environmental, economic and social aspects of sustainable development	Number of Member States which use BR and/or UNESCO Global Geoparks as a comprehensive network of observatories for resilience to climate change and natural hazards, making use of citizen science	– 50 using BR of which 7 in Africa and 5 SIDS – 37 using UNESCO Global Geoparks of which 1 in Africa and 1 SIDS
Expected result 6: Member States have developed UNESCO-designated sites as learning sites for inclusive and comprehensive approaches to environmental, economic and social aspects of sustainable development	Number of Member States which have established transboundary sites	– 30 with TBR of which 4 in Africa

28 Targets for 2019 under the $518M expenditure plan.

114. The evaluation team was unable to gather any data allowing to measure the extent to which these targets have been reached for the 2018-2019 biennium. In addition, these indicators appear to be quite limited in terms of their capacity to effectively capture the type of change the IGGP has set to achieve. Finally, it is unclear how the targets for these indicators have been defined.

115. The Programme's ability to generate credible data on its performance is also limited by the lack of additional resources to carry out this work. The management capacities of the Programme are stretched and generating additional monitoring obligations for the programme Secretariats would represent a significant additional burden.

4. Effectiveness and Impact of the IGGP

4.1 IGGP achievement on UNESCO 39 C/4 and 5 results indicators

116. Given the lack of a detailed IGGP-specific M&E framework (see Section 3 above), the evaluation struggled to extract meaningful information from UNESCO's internal reporting system (i.e. SISTER) regarding the performance of IGGP. Yet, despite the lack of any meaningful results drawn from this exercise for the purpose of this evaluation, the process itself has generated several interesting findings:

- First and foremost, UNESCO and the IGGP management bodies have not previously conducted a SISTER extraction to carry out a robust input-output analysis of the IGGP. Despite using the system to input information regarding specific projects and activities, all central-level financial and reporting and monitoring work appears to be conducted using external ad hoc tools. As mentioned previously, however, there appears to be very little monitoring and reporting work being done by the programme management.
- The existing monitoring system operating under SISTER, based on the results framework defined by the 39 C/5, is ill-equipped to capture the type of change which the IGGP is trying to generate.
- Under the current system, it is impossible to distinguish the work and accomplishments of the UGGp vs. those of the IGCP and it is also challenging to separate the work and results of the IGGP as compared to other lines of work of the Natural Sciences Sector of UNESCO. Projects logged into SISTER are not tagged to a specific programme.

117. For the purpose of this evaluation, the UNESCO IOS and IGGP representatives provided a SISTER extraction of activities covering the 39 C/5 period (2018/2019 Biennium), which were, in principle, considered to be part of the IGGP. The evaluation team has conducted a brief analysis of this extraction, in light of identifying potential relevant information regarding the results and achievements of the Programme. The main findings include the following:

- It is impossible to draw any conclusions from the analysis regarding the contribution of the IGGP to the expected results defined by the 39 C/5 for Major Programme II, Main Line of Action II, and related expected results performance indicators (i.e. 'Number of supported Member States which have strengthened national geoscience capacity in a gender-responsive manner' or 'Number of Member States which use Biosphere Reserves and/or UNESCO Global Geoparks as a comprehensive network of observatories for resilience to climate change and natural hazards, making use of citizen science)'.
- Out of a total of 32 SISTER registered operations, which are believed to be linked to the IGGP for the 2018-2019 biennium, the distribution by region is as follows:

» Africa	5
» Asia & the Pacific	5
» Latin America & The Caribbean	4
» Europe & North America	1

- Paradoxically, however, the number of operations which are said to be contributing to the African Union Agenda 2063 is limited to 4.
- The great majority of operations (i.e. 23) have a gender equality action plan and the great majority of these are considered to be gender neutral. Only 5 of these operations are qualified as being gender-responsive.

The number of operations which directly benefit Small Island Developing States (SIDS) amounts to 3.

4.2 Appraisal of activities and outputs delivered by the IGGP

4.2.1 IGCP

118. As reported above, the Secretariat does collect data for IGCP, albeit in a rather ad hoc fashion, using local tools to capture programme data and report it annually to the IGCP Council. Data are captured from the proposal submission process and individual annual project reports. The annual reporting template has been updated recently to better capture data on young / women / developing world scientists involved in projects. In addition, a 'one-off' retrospective review of IGCP was undertaken in 2018 by the IGCP Secretariat and the Geological Survey of The Netherlands,[29] which provided useful data for the evaluation.

119. Key programme outputs are:

Project activities

- 7-9 new projects funded a year, representing a proposal success rate that varies year to year based on number of proposals between 40% and 80%, and a total number of projects in progress at any one time of between 20 and 27 (Figure 4).
- Taking 2018 as a typical year, 27 projects involve a total of 160 project leaders from 106 Member States and 4,485 participants worldwide.[30] These scientists engage in project activities in a range of ways, from conducting research and conducting field work to attending seminars, workshops, meetings and training courses. As already noted, IGCP seed funding is only allocated to scientists from developing countries.
- 26 IGCP project meetings were conducted (many utilising IGCP funding to enable participation by scientists in developing countries).
- The projects covered all five IGCP technical themes, although not in equal proportions, with the Global Change representing 37% of the total.
- Year on year, increasing project participation of women / young scientists from developing countries (as shown in Figure 6 in Section 4.2).
- The majority of projects (83%) are judged by project leaders to have met their objectives either in their entirety (17%) or most of their objectives (66%).
- 36% of project leaders report linkages between their projects and UNESCO Global Geoparks.

Geoscience knowledge

- Again taking 2018 as a typical year, IGCP projects published over 300 scientific papers.
- Project leaders reported a range of actual or expected project outputs in the form of new networks, scientific publications, high quality geoscience knowledge and knowledge relevant to society and new geoscience skills (including in the global south).

New capabilities

- The high numbers of project participants working together to create geoscience knowledge, as embodied in the publications, generates new capabilities, most importantly among the participating women / young scientists from developing countries. Not only do participants gain geoscience knowledge, but many are enabled to be a Project Leader and increase their role in these international projects.31

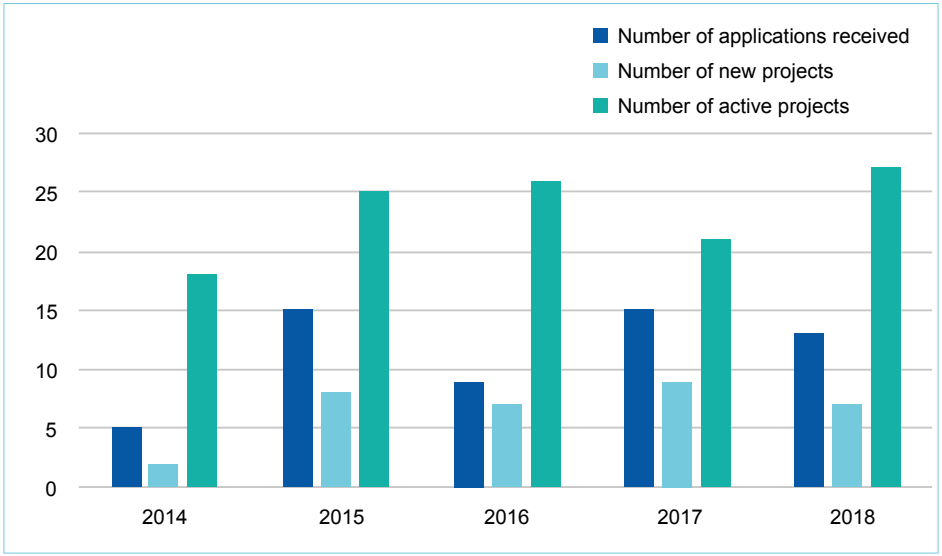
29 See https://sp.lyellcollection.org/content/early/2019/12/02/SP499-2019-73 and https://doi.org/10.1144/SP499-2019-73.

30 IGCP 2018 Annual Report, published February 209

31 Responses to Q17 in Appendix D.

- On a personal level, project leaders reported a wide range of personal capabilities gained as result of participation:
  - 85% reported developing international networks;
  - 63% raising their profile internationally;
  - 61% improving their geoscience skills;
  - 59% improving their ability to work collaboratively;
  - 52% improving their research knowledge;
  - 43% raising their profile in their own country;
  - 41% developing their understanding of research users in the public or private sectors.

Figure 4 IGCP proposals and projects



Source: IGCP Annual Reports

4.2.2 UGGp

120. The UGGp activities may be interpreted in a narrow or in a broad sense. In the narrow sense of the term, UGGp activities refer to the activities carried out by the programme through its governing bodies and through its Secretariat. These are activities which are financed and managed directly by UNESCO. In the broad sense of the term, UGGp activities refer to the previously described activities, as well as the activities carried out by GGN, national geoparks committees and regional geopark networks, in relation to the designation of geoparks, their promotion, capacity building, learning and networking. The activities of the geoparks themselves starting in the preparation stage and continuing after the designation are treated as outputs under this evaluation. For the purpose of this evaluation, the previously described broad definition of UGGp activities has been adopted, even if a full analysis of GGN work has not been carried out as part of the evaluation.

121. The UGGp activities can be classified in the following way:

- **Designing and promoting the concept of Geoparks.** Besides providing the initial impetus for the UGGp creation, all bodies and organisations associated with the programme are mandated to promote it on a global and regional basis. While GGN and the UGGp Secretariat provide a more global outreach, there are regional and national networks (presented earlier in the text), whose outreach is national or regional. There are no data on a number of undertaken promotion activities, but the perception is that both the Secretariat and GGN have been pro-active in this regard.

- **Designating Geoparks (evaluation and selection), monitoring and revalidating Geoparks.** One major pillar of the UGGp activities is related to the organisation of the designation process, starting with the development of application forms; the selection of evaluators; the organisation and reporting of the council meetings, etc. The evaluation team provided a number of recommendations for the improvement of this process. The ideal output of these improvements would be a lean, efficient and fully transparent process clear to current and aspiring geoparks.

- **Facilitating Geoparks to share best practice and exchange ideas.** The third pillar of the UGGp activities relates to sharing best practices and exchanging ideas with the goal of increasing the capacities of current and aspiring geoparks and, in that way, raising the quality of the programme. The overwhelming opinion of the project stakeholders is that this work has been done well by both the UGGp Secretariat and the GGN. The evaluation has discovered the important role played, in this respect, by the national geoparks committees, the UNESCO National Commissions and the UNESCO Field Offices.

- **Outreach and promotional activities**. These include activities such as participation in international fairs; participation in regional geopark conferences; international capacity building courses; international geopark cooperation meetings, etc.
- **Capacity building.** The Mentorship and Knowledge Exchange Programme launched recently by the Secretariat has been appreciated. The efforts of the Secretariat in capacity building, training and resource mobilisation should also be acknowledged.

122. The quality of the support and work undertaken by the Secretariat on behalf of the geopark community is generally assessed as useful or very useful by geoparks themselves. This said, almost one fourth of geoparks stated that the UGGp Secretariat support is of limited use, or of no use at all. This is a perception that could deserve further examination and analysis on behalf of the programme. The National Geopark Commissions and the UNESCO National Commissions overwhelmingly consider the UGGp Secretariat support as very useful (22%) or useful (67%). Only 11% of the respondents from these categories consider it of limited use.

123. The interaction of the geoparks with the Secretariat comes mainly through the organisation of evaluation and revalidation missions and through the organisation of an international global geoparks conference. The overall perception is that the Secretariat is less readily available to support the geoparks than the GGN and that the presence, role and influence of GGN exceed those of the Secretariat. At the same time, it should be noted that the capacity of the Secretariat is limited.

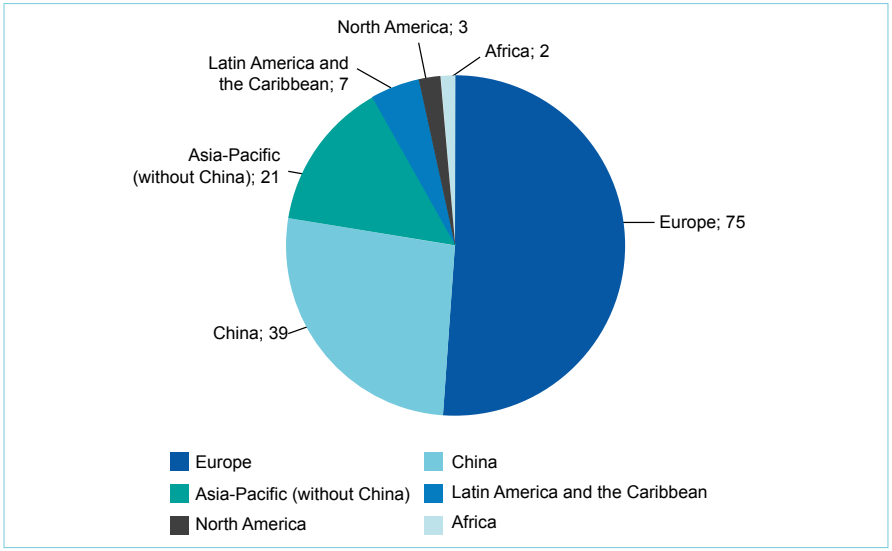
124. It should be noted that the Secretariat is not only an administrator, but also plays a technical role, for example, when undertaking activities in the field of capacity-building. Stakeholders who assess the GGN and the UGGp Secretariat support as useful and very useful consider that there exists a positive cost / benefit ratio as far as GGN and the UGGp Secretariat are concerned. In addition, the UNESCO National Commissions also provide support to both aspiring and current geoparks in terms of preparation during the designation process; small financial support; capacity building; advice; etc.

125. GGN value is seen in defending the UNESCO Global Geopark values and in providing capacity building during the application process and after the label designation. GGN is also seen as providing different platforms for exchange of experience and cooperation and as increasing UGGp visibility globally. GGN delivers common promotion tools and its support has been considered as instrumental in leveraging additional funding from other funding sources (e.g. Interreg programme in the EU). GGN also plays the role of an information broker between geoparks, a function which is assessed as very useful. Developing countries in particular expressed appreciation for GGN support.

126. The certification of geoparks is the main output of the work done by the UGGp Secretariat and the GGN. Currently, there are 147 UNESCO Global Geoparks across all continents. Eleven additional geoparks were approved at the UGGp Council meeting in Lombok at the end of August 2019 and are likely to be approved by the UNESCO Executive Board in March, 2020. As previously mentioned, the geographical distribution and density of geoparks is still strongly concentrated in Europe (i.e. 75 geoparks).32 The Asia Pacific region has a total of 21 geoparks, not including the 39 geoparks located in China. Africa and the Arab States have a very low number of geoparks. This uneven geographical spread of UGGp presence is explained by the way the UGGp started organically from Europe, followed by China, and in recent years Latin America and the Caribbean. From a strategic standpoint, and if the programme wants to deliver on driving sustainable development in vulnerable and fragile contexts, UGGp needs to expand to geographical areas which are currently underrepresented such as Africa and Central Asia.

32 µEurope and China stand out as geopark locations because of historical reasons. The strong demand for the UGG status comes from their high relevance for boosting local economic development in often remote, rural and disadvantaged areas and in the case of China because of UGGp high relevance in terms of poverty alleviation. The presence in the Asia-Pacific region (excluding China) has been growing quickly and the programme has enjoyed high demand in countries such as Vietnam, Malaysia, Indonesia and Thailand. Efforts in past years, starting in 2011, led to an increase in geopark numbers in Latin America and the Caribbean to the point of creating a momentum. The success factors for growing the network deserve to be further explored but they include efforts by the UNESCO National Commissions, the offer of intensive courses and the creation of an active regional network in 2017. There is already a pipeline of new projects of aspiring geoparks. Nevertheless, additional capacity building efforts are needed in the region to make geoparks better known to governments and UNESCO National Commissions. The potential for UGG expansion in Latin America and the Caribbean is high because of its relevance in terms of poverty alleviation and local economic development in non-touristic rural areas.

Figure 5 Geographical distribution of UGGp geoparks (147 in total)



127. One of the biggest challenges to the programme is expansion into Africa. Consulted stakeholders believe that a move in this direction would be highly relevant and beneficial for the region. In addition, this would be fully in line with UNESCO's Priority Africa. This said, there are obstacles to expanding the presence of the programme in the region, which relate mainly to challenges in setting up management structures; identifying specialists; and financial constraints. Another reason for the programme not being successful in Africa is the fact that it is not sufficiently known. This is to a certain extent due to the fact that a position of Geoscientist in the UNESCO Nairobi office is not filled. Considering the crucial role that was played by the equivalent position in Montevideo for the uptake of UGGp in Latin America, solving the problem is of crucial importance for the future success of the programme in Africa.

128. The support provided by the UGGp by means of the certification process leads to a number of actions implemented by the selected geoparks themselves. Given that these activities are one step removed from the UGGp itself, they are considered to be programme outputs. Given that each geopark project is different, the types of activities they implement may vary from one geopark to another. In general terms, however, geopark activities can be classified as follows:

- **Establishment of a management body.** The availability of a robust management body is one of the main features of a geopark. It is a major factor for the success and sustainability of the geopark. The case studies have demonstrated that the close link between the geopark management and the local authorities is of utmost importance, ensuring the local buy-in and potential financial and in-kind support. In the case of Xingwen UGG the director of the geopark is also a high-level civil servant in the county administration. In the case of Mixteca Alta UGG (Mexico) the geopark commission has been placed under the supervision of local authorities. The day-to-day functioning of the geopark is ensured by a geopark committee, which includes a wide spectrum of actors. The robustness of the management body is impacted by the capacity building efforts, the exchange with other geoparks and guidance during the designation process and following it. This is also a result of the evaluation and revalidation missions and the associated recommendations. Better planning and management systems are a guarantee that the development of the geopark will be in line with the UGGp criteria and vision.

- **Activities related to the development of the geopark in line with UGGp criteria.** These are usually related to significant initial investments for building tourist infrastructure (trails, visitor centres, etc.); construction of geology interpretation material; development and installing of visibility material; etc. The level of these activities depends on the state of the geopark before the start of the designation process. These may vary from efforts for creation from scratch to efforts for adaptation of already existing material. These activities are not financed by the UGGp and, as discussed earlier, the funding may come from various local and national sources and in-kind contributions.

- **Assessment and inventory of geological sites of international importance and setting up protective measures.** Despite the fact that geoheritage conservation is just one aspect of the UGGp concept, it remains an important one and entails a number of activities related to taking stock of (inventory) and securing the protection of geological sites of international importance. For example, in Xingwen UGG the main karst cave had been endangered before the site became a geopark and a number of protection measures were introduced.

- **Educational activities related to science popularisation.** By design, geoparks are expected to be places for learning and education. They are meant to increase the knowledge and awareness of the population with regards to geological heritage. Therefore, these activities are a major pillar for the geoparks. These activities may be targeted at a variety of actors including local citizens, tourists, local schools and universities.
- **Activities related to the development of eco-tourism.** This is one of the core activities of geoparks and it usually takes the form of adapting the infrastructure to tourism (both within the park and leading to the park), improve the accessibility of certain parts of the geopark areas, collaborate with local accommodation and food service providers to improve the overall tourist experience.
- **Activities related to capacity building for local populations.** Capacity building can also focus on non-geological aspects of the geopark development. For example, in Xingwen UGG the geopark offers courses to the local tourism service industry and to local entrepreneurs with the objective of increasing the quality of the service and therefore additionally boosting geopark-related tourism. In Mixteca Alta, the geopark has trained local guides to carry out guided visits.
- **Hosting groups of researchers interested in science popularisation.** This is usually one of the main activities of a geopark. Geoparks often have links with local / regional universities whose researchers are closely integrated with the geopark.
- **Activities targeted at the engagement of local populations and indigenous groups.** The concept of geoparks is associated with a significant local level of activity related to the geopark on or around its territory. Local populations often include indigenous groups. Activities might comprise of establishing cooperation with local service sector businesses and producers through providing geopark labels, for example, guaranteeing a minimum level of quality. These might be providers of accommodation and food, producers of ecological products, handicraft producers, agricultural producers etc.
- **Activities related to cooperation and collaboration with regional, national and international actors.** Reaching out to and working with different partners is one of the features of the UNESCO Global Geoparks. These collaborations may take various forms, for example, working with local and regional museums, local schools, research institutions, tourist organisations, business intermediaries etc. Collaboration can happen on a regional level within the same country (especially in larger countries) or at the national level. Geoparks seem to collaborate with National Geopark Committees, UNESCO National Commissions and the UNESCO Field Offices where they are available. In case a national level geopark network is available, as is the case for China, they seem to be their first natural point of contact. International exchange of knowledge is also one of the main pillars of the UGGp, based on the assumption that exchange with peers is an inspiration.

129. Based on the data gathered mainly through the UGGp case studies, the geopark activities not only appear to be fully in line with the approved projects but they also seem to correspond to the geopark development approach as defined by the programme. However, given the lack of a more robust monitoring and performance framework, it is challenging to provide a full picture of the work being done by geoparks and the intensity of the different types of actions mentioned above.

4.3 Evidence of progress towards outcomes and impacts of the IGGP

4.3.1 IGCP

130. Investing in scientific research can, and is intended to, contribute to a wide range of societal benefits. However, these benefits typically arise many years in the future and are the result of contributions from many research activities and other public and private sectors actions, which make it a challenge to attribute outcomes and longer-term impacts to any one specific project or any one specific funding stream. Therefore, for this evaluation, we report the views of participants and other stakeholders on impacts and provide specific examples (gathered from interviews, case studies and desk research).

131. Project leaders, IGCP National Committee members and UNESCO NatCom members took the view that IGCP makes an important contribution, with project leaders generally reporting a high contribution of the IGCP to:[33]

33 Responses to Q32-34 (project leaders) and Q15-17 (IGCP National Committee members and UNESCO NatCom members) in Appendix D.

- Lasting stable and sustained international partnerships and cooperation on geoscience;
- Increased scientific expertise in the global south;
- Increased visibility of female geoscientists.

132. Project leaders took the view that the IGCP makes an important contribution to increased understanding of geological processes relevant to the wider scientific community and societal needs. In particular:

- 72% of project leaders reported that IGCP made a high contribution to the wider geoscience community (i.e. beyond project partners);
- 64% reported a high contribution to the sustainable use of natural resources;
- 38% reported a high contribution to the climate;
- 28% reported a high contribution to human living conditions;
- 28% reported a high contribution to policy-makers who might use the knowledge created.

133. The case studies demonstrated several of the potential outcomes and impacts described above.

134. ICGP project 640 S4SLIDE, under the geohazards theme, addressed the issue of sub-marine and sub-aqueous landslides that pose a risk to human life and economic activities via coastal damage or tsunamis. The project is directly relevant to the Sendai Framework for Disaster Risk Reduction 2015-2030. The project involved Projects Leaders from 10 Member States and conducted activities across a further 22 across all five continents. Like many IGCP projects it built on previous IGCP projects. It involved not only research but also focused on facilitating interactions between scientists, engineers and the public and private sectors that might be affected by these landslides or be charged with mitigating the risks of potential landslides. It continues to deliver knowledge, tools and skills to better understand sub-marine and sub-aqueous landslides and providing means to reduce their effects on human life and create longer-term impacts. These include:

- Introduced a standardised method of measuring morphometric data for documenting subaqueous landslides. This is forming the basis of an ongoing effort to develop and populate an online open access database and catalogue of such standardised data and making it available to governments and businesses responsible for risk reduction and for offshore infrastructure planning as well as geoscientists.
- The database and knowledge created by the project is already being used by the public and private sectors, including the energy sector and the UK's National Oceanographic Centre.
  - A number of coastal States used submarine landslides in their applications for extended continental shelves. French Guyana, for example, extensively referenced a paper from one of the UNESCO IGCP volumes that showed submarine landslides off their margin to substantiate their arguments for an extended continental shelf. This was paramount in allowing them to establish their outer maritime limits.
  - The Geological Survey of Canada was the first to implement the recommendation given by IGCP S4SLIDE funded initiative on a classification scheme (provided in a project publication).
  - The International Cable Protection Committee (global umbrella organisation for subsea cables) noted that IGCP S4SLIDE project information is essential for improving subsea cable routes and has been instrumental in the design of one new cable route through the cable-congested Strait of Luzon between Taiwan and the Philippines.
- The project helped develop the careers of a number of participating scientists including the main Project Leader, a female geoscientist from Venezuela and an academic from Canada who has since been invited to become a commissioner at the UN on the 'Commission on the Limits of the Continental Shelf' elected by 164 State Parties to the United Nations Convention on the Law of the Sea (UNCLOS) treaty. His involvement in UNESCO IGCP played a role in his election.

135. ICGP project 636 Geothermal energy focused on an important low carbon energy source (relevant to SDG 7: Ensure access to affordable, reliable, sustainable and modern energy), aiming to propose suitable methodologies and techniques for

characterising and modelling fractured geothermal reservoirs to ensure their sustainable exploitation and, importantly, seeking to understand and compare public perceptions of geothermal energy in different countries and what might need to be done to improve the acceptability of geothermal energy. The project involved Projects Leaders from five Member States with the main Project Leader a female geoscientist from Colombia. It involved fieldwork in numerous countries including Colombia, Canada and Madagascar.

136. The project has created, and is still creating, outputs that may lead to longer-term impacts in the following ways:

- Developing ongoing and sustainable geoscience networks. Project participants from several countries bid successfully for a networking project under the CYTED Network (the Ibero-American Program of Science and Technology for Development Network). This enabled researchers from seven countries (Argentina, Colombia, Chile, Uruguay, Ecuador, Mexico and Spain) to continue the research cooperation started under IGCP.
- Training 48 young scientists, 50% of which from the global south (mainly Colombia and Chile) including undergraduates who participated in research activities, some of whom have gone on to take Master courses.
- The appointment of the main Project Leader as leader of AGEOCOL Antioquia Regional Chapter, an association created in 2017 to promote the use of geothermal energy in Colombia. The association includes members from government, academia and industry and promotes discussions on topics such as using geothermal as the baseload renewable in Colombia's energy mix, the role of communities, funding support and multilateral banking.

137. There is a more general positive effect of the IGCP on cultivating an international community of geoscientists in the IGCP itself as a focal point for international linkages and networks beyond the funded projects. Project participants become project leaders or project leaders go on to become members of IGCP National Committees or Scientific Boards as well as national geoscience bodies. This is not to suggest that IGCP is a closed shop or club, but that these scientists go on to support the development of other younger scientists in a virtuous circle. Interviewees reported that there is no other form of international funding for geoscience and, although funding is small, it is an important catalyst for building communities around key geoscience topics.

4.3.2 UGGp

138. By and large, the observed outcomes and impact of the UGGp are in line with the Theory of Change developed at the inception stage of the evaluation (Appendix C). The stakeholder consultation pointed to several groups of outcomes and their associated impacts, which can be summarised as follows:

- **Improving the geopark planning and management systems.** One of the main outcomes from the UGGp activities appears to be the strengthening of the internal geopark planning and management systems. More than 70% of respondents consider it high or very high. This comes about through the efforts for establishing a robust management body and through the capacity building and guidance during the designation process and after that. This is also a result of the evaluation and revalidation missions and the associated recommendations. Better planning and management systems are a guarantee that the development of the geopark will be in line with the UGGp concept.
- **Increased visibility of geoparks locally and internationally.** The UGGp designation has had an immediate impact on the visibility of geoparks locally and internationally and this was confirmed by almost 90% of the geopark respondents. This is not an end in itself, but is closely linked to the outcomes, especially related to increasing sustainable tourism in the region and increasing the sense of pride among local citizens. Increasing visibility of the geopark also enhances the chances for effective geoconservation, as it makes it more difficult to damage or destroy a site. UNESCO visibility locally and nationally also increased significantly.
- **Developing links with geoparks from other countries.** Becoming a part of the UGGp system automatically makes the geoparks more exposed to positive examples of other geoparks in the region or globally. This has been singled out as a significant outcome of the designation by almost 80% of the geoparks. This happens through different networking opportunities, as explained previously in the report. Exchange of good practices in geopark development is a major source of inspiration for subsequent improvement. It is also an enabling condition for reaching other outcomes and impacts. One geopark shared that one of their proudest achievements is the close partnership they have been able to develop with their sister geopark. Their exchange with it has had a profound

impact on both geoparks, as they have been learning and growing together. This is a bottom-up approach to north-south and south-south cooperation.

- **Increased understanding of the importance of geological heritage and improving general culture and knowledge of geoheritage.** UGGp contributes significantly to an increased understanding of geological heritage in the regions where geoparks are located. This happens through the increased visibility of the geosites and the significant number of local people and tourists who are confronted with the geological heritage and the popularisation activities that this involves. This includes citizens, businesses, indigenous communities, schoolchildren, etc. One geopark reported that thanks to the UGGp label it connected with local populations and young people to explain their heritage, including geo-heritage, and to explain the importance of the Earth and its finite resources and how this has shaped people and their use of this territory. Despite the rigid national curriculum, they have designed workshops and field visits that children from 3 to 18 years old can participate in and they have had more than 4,000 school children take part in 2018 alone.

- **Improved geoheritage education.** Education is one of the main pillars of the UGGp and is a main vehicle for improving the understanding of the importance of geological heritage and improving general culture and knowledge of geoheritage. Geoheritage and sustainability education are usually promoted through agreements between local authorities and geoparks. Geoparks also collaborate with vocational centres. As mentioned earlier, they target people of different ages – schoolchildren, local people, businesses, university students, etc. Both the survey and the case studies confirmed the significant impact geoparks have on education. Almost 80% of the UGGp survey respondents underlined that UGGp designation has had very high or high impact on improving general culture and knowledge regarding the geoheritage contained in the site.

- **Development of sustainable tourism in the region**. One of the main outcomes of the designation of a territory as a UNESCO Global Geopark is the development and / or intensification of sustainable tourism in the region of the geopark. This comes mainly through increased visibility of the geopark locally and internationally. More developed sustainable tourism leads to local economic development and growth in quality jobs including youth and women employment and revenues that go with it. Increased tourism has also led to higher sales of local micro-, small and medium size businesses. Less than 10% of the geoparks consider that the UGG designation has a very limited impact on tourism. This only suggests that there are other factors which enable tourism development, such as accessibility or the quality of the local service on offer. In order to facilitate the increased inflow of tourists to UGGps, improvements in local infrastructure have been made, thus leveraging additional national and / or local investments. For example, one geopark reported that the Geopark Code of Practice for Sustainable Tourism Businesses had been adopted by 48 sustainable tourism businesses in a regional ecotourism network. Another geopark reported that, through the UGGp designation, they have attracted a new kind of visitor more sensible to environment protection and geoprotection, and in this way creating a green identity for the region as a tourist destination.

- **Effective geoconservation.** Geoparks have reported that becoming a UNESCO Global Geopark increased the chances of protecting and conserving the local geological heritage. Although some of the defining geological sites should have a protected status, other sites do not have this status. Xingwen UGG reported that one of the most prominent geological features of the geopark – the karst cave – suffered damage in the past. This is not the case anymore due to better protection measures, but also due to scientific research on how to better protect the site. One geopark reported that, as a result of the geopark designation, geoconservation has been included as a discipline within geosciences.

- **Better cooperation of territorial actors and groups.** Another prominent outcome of the UGGp designation process, including the preparation stage, is the enhanced cooperation between the geopark and other territorial actors such as businesses, NGOs, schools, museums, farmers, etc. The geoparks seem to become the glue which binds different groups together around a common story. One geopark reported a better cohesion in the territory, whereby both public administrations and private sector organisations move towards the same direction, sharing the same goals. GGN has reported improvement of cross sectorial collaboration as UGGps collaborate with the Network of the UNESCO Associated Schools (ASPNet) in many countries, improving the educational impact of geoparks.

- **Facilitating local and indigenous community engagement.** More than 90% of the geoparks reported that geopark designation improved engagement with

local indigenous communities. Such communities often live on the territories of a geopark or close to them. Geoparks provide opportunities for high quality employment. They also allow featuring the local cultural wealth to tourists, which additionally increases the pride of place.

- **Increasing the identity and pride of people.** This outcome has been identified as another important result of the UGG designation process. Increased pride comes through better knowledge and understanding of the underlying value of the geosite. It also comes through increased visibility locally, nationally and internationally and the bigger attention to this and other assets of the local community. In addition, the increased pride of place comes through the opportunities for jobs locally and maintaining family and community cohesion. This often happens in a context of decreasing population. One geopark reported that visible art and structures created by the geopark around the territory educate and give pleasure and well-being to locals and visitors. It has also been reported that in some cases the employment opportunities have kept people locally who would have otherwise left the region.

- **Critical mass of geoscientific expertise.** Geoparks seem to have a significant impact on raising the critical mass of geoscientific expertise. This happens through intensified collaboration with universities and ministries of education and deepening the research of geological heritage.

- **Contribution to disaster risk reduction (DRR).** This outcome has been assessed as high or very high by almost 70% of the survey respondents. Geoparks often organised activities such as earthquake protection training. In one particular case, an earthquake happened soon after such a training took place in a school and no one was harmed.

- **Improved participation of women in local communities.** This has not been singled out as a particularly prominent result. However, we can assume that many of the jobs created locally in cultural activities, sales, service sector, handicrafts etc. have been taken up by women. This led to women empowerment in many UGGps. Some 49% of UGGp respondents to the survey pointed out that UGGp designation had a very high and high impact on participation of women in local economic activities, while 32% think the UGGp designation has had some impact on this.

139. Geoparks reported some unintended impacts such as:

    - **Impact on national policy,** such as the adoption of regulations or laws for the creation of national geoparks;
    - **Beneficial impacts on the environment** through biodiversity conservation;
    - Positive impact on climate change through the use of geoparks as rural eco-systems providing climate change adaptation services.

140. It is worth noting that some of the survey respondents consider that some of the observed outcomes and impacts would have happened even without the UGGp designation. The evaluation is not able to come up with a conclusive statement as to what part of the outcomes and impacts would have happened anyway, which ones are due exclusively to the UGG designation and which ones are simply enhanced by the UGGp designation. The evaluation team believes that, on the basis of this analysis, it is reasonable to posit that the UGGp contributed to Expected Result 4 on strengthened management of geological resources and geohazard risks. As demonstrated in this section, UGGp has also contributed to Expected Result 6 on the development of UNESCO-designated sites as learning sites for inclusive and comprehensive approaches to environmental, economic and social aspects of sustainable development.

4.4 The contribution of IGGP to the Sustainable Development Goals

141. The evaluation team found that, according to survey respondents, IGGP, through both IGCP and UGGp, directly or indirectly contributes to several SDGs, including:

    - UGGp supports impact on SDG 1 and poverty alleviation through the creation of sustainable local jobs in sectors such as agriculture, handicraft, commerce, culture, etc. Increased revenues from tourism enlarge the local tax base and create additional local employment. Some 65% of the geoparks acknowledged high or some contribution.
    - UGGp supports impact on SDG 3 on good health and well-being mainly through providing the opportunity for active recreation to a large number of local people and tourists. Geoparks provide opportunities for active mobility and

also contribute to the emotional balance of the visitors through their aesthetic value. Some 87% of the geoparks reported high or some contribution.

- UGGp makes a perceived contribution to impact on SDG 4 (quality education for all) through its strong interaction with schools and universities, through its geoheritage popularisation activities and through capacity-building for local populations in a number of areas. IGCP contributes to SDG 4 through focusing a significant proportion of its funding on young scientists, especially those in developing countries. Some 98% of the geoparks reported high or some contribution.
- IGCP places significant focus on supporting female geoscientists (SDG 5). Female scientists make up 32% of current project participants and both the Council and Scientific Boards are at or very near gender parity. UGGp also generates positive effects on female geopark populations mainly in terms of employment opportunities. Some 76% of the geoparks confirmed high or some contribution.
- IGCP contributes to SDG 6 and SDG 7 in as far as an understanding of geology is key to understanding and utilising water resources and many forms of affordable and clean energy. The IGCP theme 'Earth Resources' focuses on environmentally responsible exploitation of hydrocarbons, geothermal energy and water, which is crucial to the future well-being of society.
- One can single out the impact of UGGp on SDG 8 both through its decent work component and its economic growth component. The evaluation has collected sufficient evidence for that through the surveys and the case studies. Some 87% of the geoparks acknowledged high or some contribution.
- UGGp has had a perceived impact on SDG 11, especially on its sustainable communities dimension. It has been demonstrated that the cohesion and livelihood of local communities is significantly enhanced through the opportunities offered by the geoparks. The impact also comes through the Disaster Risk Reduction (DRR) dimension of SDG 11. Some 93% of the geoparks acknowledged high or some contribution.
- UGGp is seen to contribute to SDG 12 through the perspective of responsible production. As described earlier in the text, and in the case studies, geoparks often trigger the production of ecological agricultural products and food.
- SDG 13 on climate action is supported by IGCP through its theme 'Global Change and Evolution of Life theme' that supports scientific research to gather evidence from the Geological Record Changes in the Earth's climate and via its support for the development of sustainable energy sources (SDG 7).
- UGGps acknowledged a very high contribution of UGGp to SDG 15 Life on Land. Indeed, contributions to impact on SDG 15 come through UGGp efforts with regards to sustainable biodiversity and ecosystem use.
- UGGp and IGCP rely heavily on local, national and international partnerships and, in this way, are also seen to contribute to SDG 17. Active exchange of knowledge and good practices is one of the signatures of the Programme.

142. These are some examples of perceived contributions of the IGGP to the Sustainable Development Goals. Additional examples are available in Appendix D.

4.5 IGGP impact on UNESCO priorities: Gender, youth, Africa and SIDS

143. Given the lack of a specific results framework covering the gender, youth, Africa and SIDS dimensions of the Programme, providing an assessment of programme impacts at these levels presented a challenge for the evaluation. This said, the evaluation was able to generate some data regarding strengths and weaknesses in this regard.

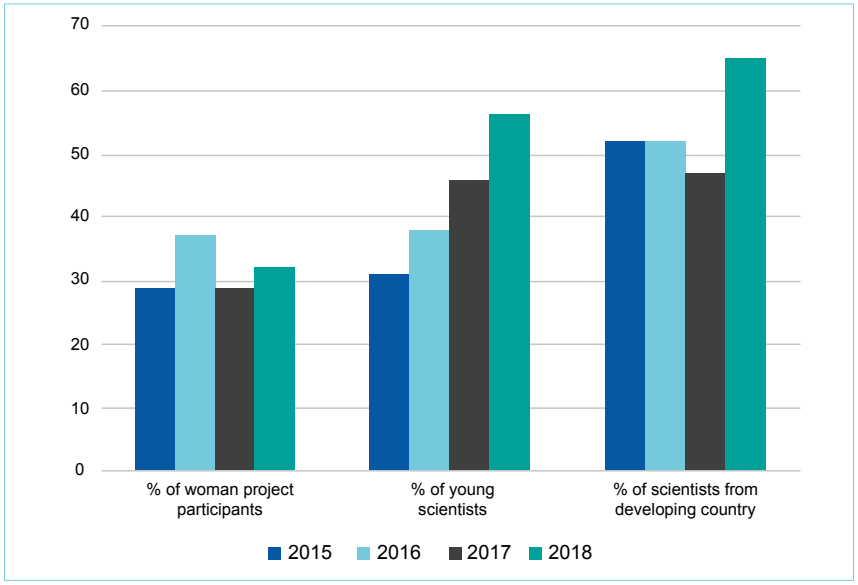
144. Overall, IGGP contributions to UNESCO's Priority Africa remain modest and are mostly linked to activities carried out by the IGCP sub-programme. The IGGP as a whole remains considerably Euro-centric, despite recent efforts to increase the participation of developing countries. Gender Equality is significantly addressed by both sub-programmes, albeit in a more implicit manner by the UGGp as compared to the IGCP. Both pillars consist of gender-balanced governance bodies, although the number of female evaluators working for the UGGp as compared to their male counterparts remains unclear. Support of youth as a vulnerable group is also addressed by the Programme, and some interesting results have been generated as a result. Support to SIDS, however, is completely absent from the IGGP's realm of intervention. The IGGP guidelines make no mention of how the Programme is meant to tackle these institutional priorities, beyond the rules governing the composition of the IGCP and he GGp councils.[34]

34 According to the guidelines 'Ordinary Members appointed to the Council shall be high-profile experts chosen for their proven experience, scientific or professional qualifications in relevant fields, taking into account an equitable geographical distribution and gender equality.'

145. IGCP's proposal guidelines clearly state that project proposals should identify how they will address the challenge of capacity-building in developing countries and focus on under-represented groups such as women and youth, especially those from developing countries. IGCP has provided support in the form of grants to researchers based in Africa. However, to date, Africa has not received a similar volume of grant support compared to other regions of the world that participate in IGCP.

146. Nevertheless, IGCP data show that the programme increasingly reaches women geoscientists, young geoscientists and geoscientists from the developing world in line with its goals. Where project leaders are concerned, the balance is slightly weighted towards developed countries with 52% of project leaders in the projects covered by the evaluation coming from Europe, USA, Japan and Australia.[35] However, the wider participation by young / female / developing country scientists is helping to create the project leaders of the future.

Figure 6 Participation in IGCP projects by women / young / developing world scientists

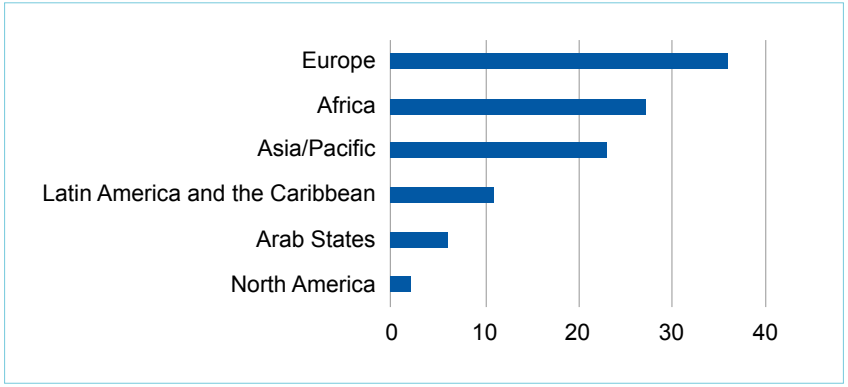


Source: UNESCO IGCP

35 Data on Project Leader provide by IGCP Secretariat.

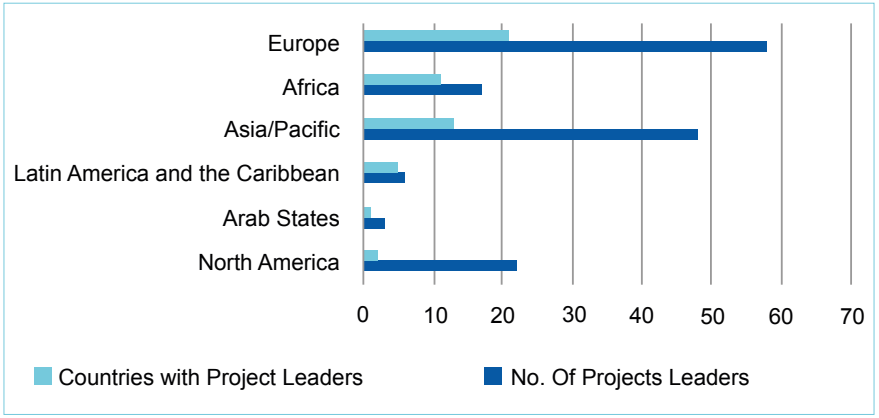
147. IGCP has a reasonable presence in Africa although it can be improved. Figure 7 and Figure 8 show that, in 2018, 28 African countries participated in IGCP projects with African project leaders (from 12 countries) making up 11% of the total number of project leaders.

Figure 7 No. of participating Member States by region for the IGCP



Source: UNESCO IGCP

Figure 8 Distribution of project leaders by region



Source: UNESCO IGCP

148. The Africa region is represented on IGCP governance bodies such as the council and scientific board. However, the number of participants is similar to that of other regions of the world.[36] Based on data collected by the evaluation team, the IGCP council is currently gender-balanced (3 male and 3 female).

149. The UGGp, on the other hand, appears to be clearly lagging behind when it comes to supporting the emergence of geoparks in Africa. Sub-Saharan Africa currently only hosts one geopark (Tanzania), making it one of the most under-represented regions of the programme, along with the Arab States (one park in Morocco) and Central Asia. The lack of more formal recognition of gender in the programme's founding documents and (tacit) theory of change does not mean, however, that the sub-programme is not leading to valuable results in terms of female empowerment and gender equality. In the case of the UGGp, and as illustrated by some of the case studies, the existence of geoparks is directly influencing and benefitting groups of women. In the case of Mixteca Alta in Mexico, for instance, this includes the groups of female guides trained by the geopark as well as the pottery makers who now sell to geopark visitors. The UGGp directly supports youth through, for instance, the educational and training activities implemented by UGGp-certified geoparks.

150. One African representatives sits on the UGGP Council, as compared to 6 from Europe, 2 from Asia, 1 from the Arab States and 1 from Latin America. The UGGp council is composed of 7 female representatives and 5 male ones.

151. The IGGP is in a similar situation with regards to youth. Despite there being no formal recognition of youth as a specific type of target or beneficiary group within the Programme structure, the IGGP is directly supporting groups of youth through the activities it carries out. There does not appear to be any explicit link between the IGGP and UNESCO's Small Island Developing States (SIDS) Action Plan.

4.6 The impact of IGGP on disadvantaged groups

152. The IGGP addresses the needs of some disadvantaged groups, although there does appear to be room for additional improvement. The previous section has illustrated the types of IGGP-related results impacting vulnerable groups such as women and youth. In addition to this, many of the activities supported by the IGGP are implemented in particularly fragile and poor territories or communities, such as in predominantly indigenous ones. The Mixteca Alta, Xingwen and - to a lesser extent – Villuercas case studies illustrate how the geopark approach has been successfully deployed to address the needs of communities and territories, which, for several reasons, lag behind.

153. Yet, when looking at macro-level activity and output indicators, it appears that the Programme is still largely supporting Europe, which is far from being the most fragile region of the world. Africa and SIDS, which include some of the most vulnerable and disadvantaged countries, are outliers in the overall portfolio of activities and resources allocated by the Programme. As such, while IGGP is making a difference in the lives of many individuals belonging to disadvantaged communities and territories, a further effort is still required to make this support more explicit at Programme level, in order to further move the needle in this regard.

5 Sustainability of the IGGP

5.1 Financial sustainability of the IGGP

154. The financial sustainability of the IGGP can be understood on three levels: securing funding for running the IGGP Secretariat (for both sub-programmes), securing funding for IGCP project grants (i.e. the UNESCO seed-funding) and securing funding for the functioning of the geoparks themselves. Regarding the first and second points, financial sustainability is largely dependent on the continued financial commitment on behalf of UNESCO, as well as on behalf of the Programme's two key partners: the GGN and IUGS. For the time being, there is no reason to believe that any of these stakeholders will immediately withdraw their support provided to the Programme. The extent to which they are willing to make further contributions in light of expanding the beneficiary base and portfolio of activities is, however, uncertain.

155. IGCP is currently funded by UNESCO itself, along with IUGS and contributions from Jeju Province Development Corporation (JPDC) of the Republic of Korea and the UNESCO National Commission for the People's Republic of China. Funding was the

36 Given its 17 members in the IGCP Scientific Board, Europe appears to be clearly over-represented in this body.

only area consistently reported by all stakeholders as an issue for IGCP, both in terms of its effects on the amount of funding for individual projects and the number of projects that can be supported at any one time. At present, demand outstrips supply by around 100% (i.e. twice as many proposals are received as can be funded in any one year). Compared to other research programmes, this is not particularly high, but this is also a consequence of limited resources for promoting the sub-programme. Furthermore, while the Secretariat has started to increase promotion of the pillar, this creates the risk of even lower funding grants per project if more high-quality proposals are submitted, due to the funding model and equation. As noted in Section 2.4, new funding sources need to be sought with great care to ensure UNESCO's reputation is not put at risk via funding partners that engage, or might engage in future, in activities or support positions which run counter to the work and standards of UNESCO as a United Nations agency.

156. For the time being, there are three sources of funding for the UGGp: the yearly fee of 1,000 EUR / geopark; UNESCO regular programme budget and UNESCO extra-budgetary funds. The GGN also makes significant in-kind contributions to the programme (not quantified). It is necessary to continue to sustain all of these sources of support and financial contributions. We believe that, despite the fact that a majority of geoparks perceive the amount paid to GGN / UNESCO as acceptable, there is little margin for increase of this fee. Naturally, an increase of the UNESCO contribution as well as of extra-budgetary funds would be beneficial for the programme and would allow hiring additional staff in the Secretariat and scaling up of activities. This is likely to become urgent in the near future with the constant increase of the number of geoparks and the additional efforts associated with new geoparks. As such, increasing the revenue and funding base of the programme should be considered a key priority. The powerful message of the programme and its positioning on the nexus of conservation, education, sustainability and identity agendas could open up doors of many potential funding agencies and / or donors.

157. The second aspect of the UGGp financial sustainability is the sustainability of the geoparks themselves. This is a particularly critical issue, especially for geoparks in developing countries, which tend to have more limited access to sources of public funding. The example of the Mixteca Alta geopark in Mexico perfectly illustrates the challenges faced by recent geoparks in fragile contexts in generating and securing a steady flow of income in order to ensure survival in the long-term.

158. Some 41% of the UNESCO Global Geoparks consider that their future existence is secured financially. About 52% of the geoparks perceive their financial sustainability as average. About 7% (or around a dozen geoparks) of the survey respondents think their financial sustainability is only guaranteed to a limited extent.

159. The financial sustainability of geoparks is based on several conditions:

- Maintaining the revenues from entrance fees. Geoparks are an excellent example of ecosystem services and having an entrance fee is reasonable for them. However, the level of the entrance fee should be set in a way to allow a large share of the local population and visitors from other parts of the country or abroad to enjoy the geopark without straining their budgets. Therefore, the increase of the revenues from entrance fees should come from an increased number of visitors rather than from an increase in fees. Naturally, the increased number of visitors raise the issue of seasonality and the need to distribute the visitors throughout the year rather than in several months. Increasing numbers of visitors also requires exploring the issue of saturation.

- Subsidies from the local / regional government. A number of geoparks are closely related to the local and / or regional governments, who subsidise their staff and operation. This is especially the case with geoparks who do not charge entrance fees. However, even geoparks that charge entrance fees can have a certain portion of their budgets covered by the local and / or regional authorities (e.g. the Xingwen County budget covers around 20% of the annual budget of the Xingwen UGG, the rest being secured from entrance fees). The local / regional funding is extremely important for geoparks and should be maintained and increased. It is a win-win situation, whereby local governments benefit in terms of increased attractiveness for tourists and improved quality of life, which could attract new businesses and people.

- Subsidies from the national government. Some UGGp receive support from different ministries as based on applications for funding. Others also receive support from other state entities, such as geological surveys. National funding could be additionally explored and funding sources could be associated with one of the following aspects of geoparks: sustainable tourism (ministry in charge of tourism); sustainable local development (ministry in charge of economic development); ecosystem services and climate change mitigation / adaptation (ministry in charge of environment), etc.

- Grants from international and regional funding institutions and donors. For example, we have evidence of geoparks that managed to leverage additional funding from European Structural and Investment Funds (ESIF) in the period 2014-2020. Others succeeded in having INTERREG projects focusing on the interregional dimension of the cooperation between geoparks. While such grants provide an excellent opportunity to improve certain aspects of the functioning of the geoparks and / or receive inspiration from others, they can hardly ensure the operation of the geopark.

- Private funding. The survey demonstrated that although private funding is not a major source of revenues, some geoparks receive donations from the private sector. Unfortunately, the evaluation did not gauge the size of these donations. It is clear that the private sector influences the sustainability of the geoparks through the quality of the private services provided, which are in close relation with tourism. We can say that the better the availability and the standard of the accommodation and food within and close to the geopark, the higher its attractiveness will be and the higher its revenues from tourism. The visit to most geoparks would take at least two days, so being able to find good accommodation may be a decisive factor for a visit. Some geoparks have realised the importance of accommodation and food providers and provide training to increase their quality.

- Voluntary contributions. The UGG concept relies to a big extent on voluntary efforts from the local population and non-governmental sector. These should not be underestimated as they can fill gaps in funding. Voluntary efforts could be deployed in guiding services; cultural activities; cleaning up, etc.

5.2 Operational and institutional sustainability of the IGGP

160. In this context, operational and institutional sustainability can be interpreted in two ways: that of the IGGP Secretariat and that of the geoparks themselves. Firstly, the operational and institutional sustainability of the IGGP Secretariat does not seem to be endangered. No concerns have been voiced with regards to the embeddedness of the Secretariat in the Earth Sciences and Geo-hazards Risk Reduction Section of the Division of Ecological and Earth Sciences. The fact that the Secretariat is understaffed may represent a risk of fatigue or burnout of staff, or may otherwise limit the capacity of the Programme to adequately fulfil its duties. While the evaluators are not in a position to judge the sustainability of the UNESCO budgetary allocation for the section, as mentioned earlier, we believe that there is potential for raising additional extra-budgetary funds, which will allow the expansion of the Secretariat along with an increase in numbers of geoparks and activities.

161. The second dimension of operational and institutional sustainability is related to the geoparks themselves. About two thirds of the geoparks consider that their operational and management arrangements are highly stable, which is a promising result. The remaining third of the geoparks think these are acceptable, factoring a possibility for improvement. Only one park has assessed its operational and institutional sustainability as problematic. With regards to financial sustainability, the recent geoparks in developing and fragile contexts appear to be the ones at higher risk of operational and institutional failure. This is not only related to financial resource constraints, but also to the more limited access to qualified human resources and on-and-off support that may be provided by local or national authorities given changes in government administrations and priorities. As such, the programme could think of ways of providing additional support to these vulnerable and at-risk geoparks.

5.3 Sustainability of IGGP-generated results

162. IGCP activities create scientific outputs that continually add to and build on the stock of geoscience knowledge and skilled geoscientists and, therefore, its results are highly sustainable. As for most scientific research, there is always more that can be done to increase the adoption of scientific outputs by 'end-users' in the public and private sectors to enhance their contribution to societal impact and in terms of progress towards the SDGs. This might include broadening the membership of the Council and / or Scientific Boards to include businesspeople and policy-makers in programme decision-making and seeking the involvement of these stakeholders, for example, as members of project advisory boards. Both are common in large-scale publicly funded research projects that are intended to support and create societal impact.

163. Guaranteeing financial sustainability will ensure the sustainability of UGGp-generated results, as well as their operational and institutional sustainability. This is valid in particular with regards to outcomes such as greater visibility, whereby the geopark should continue its marketing and networking efforts to sustain this outcome. In order to sustain results, geoparks should also continue to innovate in order to keep the concept evolving and interesting to the public. Geoparks should remain sensitive to evolving needs and priorities.

6. Conclusions and recommendations

6. 1 Relevance of the IGGP

164. The IGGP is well-aligned with the needs and challenges faced by its main beneficiaries and constituencies. One of its key strengths is that it both provides a broad spectrum of support and operates with flexible implementation modalities, which benefits participants in a wide range of developmental, political and institutional contexts.

165. The IGGP is highly relevant to the overall strategic ambitions of UNESCO and its key implementation partners. Supporting geosciences is a relevant approach to engage with the Agenda 2030 Sustainable Development Goals. From a programmatic perspective, the two IGGP sub-programmes ('pillars') appear to work in relative separation, however, and internal coherence of the Programme is limited.

166. To address these points, we recommend the following:

Recommendation 1: Make a clear statement regarding whether the Programme considers certain geographies or territories strategic priorities in the short term, and explicitly formulate and justify how these territories are to be pro-actively targeted through Programme activities.

This applies to both pillars of the programme. In order to implement this recommendation, programme strategy should reflect whether there is an intention to increase programme presence in specific regions and/or types of countries. This internal reflexion could be carried out within the framework of a broader discussion regarding the strategic vision for the programme in the future, including how it intends to address UNESCO global priorities, such as Africa.

Recommendation 2: Undertake further efforts to enhance cross-pollination and programmatic synergies between IGCP and UGGp within the IGGP.

Resources could be pooled in order to improve communication on the existence of these sub-programmes. This could result in efficiency gains, enhanced results and increased visibility of UNESCO actions in support of Earth Sciences worldwide. Part of this work could be carried out by Field Offices.

6.2 Efficiency of the IGGP

167. Overall, the Programme is run efficiently, in spite of its limited resources in light of the breadth and scope of its activities and objectives. IGCP is run by a bare minimum of staff while, as a scientific research programme, still being managed according to international best practice. Therefore, there are limited opportunities to increase its efficiency. The same applies to the UGGp.

168. The Programme is run with a lean and well-structured governance system. The governance bodies meet on a regular basis and fulfil their duties as outlined in the programme statutes. The Programme would benefit, however, from a higher level of transparency as well as more frequent publication of governance body meeting notes and key decisions (e.g. publication of Bureau meeting reports).

169. The bottom-up, expert-driven nature of the Programme is one of its key strengths and distinguishing factor and has contributed to its capacity to generate intended results. Nevertheless, Member States remain the key beneficiaries and constituents of UNESCO and, as such, IGGP must ensure their views are adequately taken into account in decision-making processes and that they feel comfortable with them. Thus, the IGGP needs to develop the highest possible standards in terms of the robustness of selection criteria and processes.

170. The strategic partnerships with the GGN and IUGS have proven key to the delivery of the programme and the expansion of capacities and resources to do so. These partnerships should continue to be strengthened, while ensuring that the specific roles and responsibilities of each partner are adequately defined, in order to avoid overlaps and confusion and to improve the understanding of these roles within the beneficiary community.

171. Both UNESCO and GGN could improve on transparency when it comes to the annual contributions made by geoparks. While, in general, the value for money of these contributions is seen to be high, a number of observations were made regarding the information available on how this money is used and by whom.

172. National geopark committees and regional geopark networks play a key role in the delivery of the Programme and in making the geopark community a vibrant one. However, getting these committees and networks on their feet in countries where they do not yet exist, and clearly defining their roles and responsibilities (especially vis à vis UNESCO National Commissions and Field Offices) remains a challenge.

173. The level of involvement of UNESCO Chairs and Category II centres in the delivery of the Programme is sub-optimal. These players could provide valuable support in carrying out some of the Programme's activities and helping sustain the pipeline of high quality projects supported by the Programme. If leveraged correctly, these partners could reduce the burden of work on the IGGP Secretariat.

174. The financial leverage effect of the Programme is high, both at the central level and at the level of individual IGCP projects and geoparks. This said, further efforts could be allocated to raising additional extra-budgetary funds in order to increase the financial capacity of the programme. The IGGP story contains many elements which could be of appeal to third party donors and funding agencies.

175. While considerable efforts have been undertaken in recent years by the Programme to further strengthen its selection criteria and processes, there is still room for improvement. Its credibility and long-term survival will depend on the extent to which it manages to maintain a solid reputation among external stakeholders and trust in the quality and objectivity of its selection procedures and criteria. This is particularly the case for the UGGp, which needs to ensure that its selection procedures are widely recognised as of the highest quality and scientific standards. This involves developing a more robust and formal evaluator selection procedure, diversifying its evaluator roster, reviewing some of key evaluation criteria and enhancing transparency of the entire process.

176. The Programme lacks a robust monitoring and evaluation system, as well as a performance framework which adequately allows to capture the results and work it carries out. In addition, the Programme is failing to capture any data or information regarding its contribution to the expected results set out in UNESCO's 39 C/5.

Recommendation 3: Allocate additional resources to the IGGP Secretariat, mainly by bringing in additional staff.

Efforts should be made to increase the staff base of the programme and, where possible, the size of seed funding that the programme provides to beneficiaries through the IGCP.

Recommendation 4: Maintain UGGp status as an international programme with a bottom-up, expert-driven orientation.

The UGGp should ensure high standard processes and procedures in order for geopark applications and revalidations to be judged exclusively on the basis of their merit, using clear criteria and transparent processes.

Recommendation 5: Seek a more active participation of Member States in the Programme by promoting their involvement in existing UGGp mechanisms, such as the validation / sponsoring of aspiring geopark applications and participation in Council meetings as observers.

Increased participation of Member States is likely to increase ownership of the programme on their behalf, which may in turn lead to higher levels of support for geoparks.

Recommendation 6: Increase frequency of communication from the UGGp Secretariat to the geoparks and National Committees, on the support that can be provided by the Secretariat and to provide information on the latest UGGp developments.

Such communications may increase awareness of services available to geoparks and activities undertaken by the UGGp Secretariat. These communications should include an annual report from the Secretariat to the GGN and its members on the activities undertaken, including through geopark contributions.

Recommendation 7: Improve guidance to countries that do not yet have a National IGCP or Geopark Committee, providing examples of how such Committees operate, including best practices for setting-up and maintenance.

This guidance might indicate that countries could initially have only one IGGP National Committee, covering both sub-programmes, to help build national capacity to support IGGP activities in the Member State. This might be helpful, for example, to stimulate activity in Africa. Once such National Committees are in place, the programme should provide continued support to ensure they operate sustainably and fulfil their mandate.

Recommendation 8: Implement a light, flexible and efficient mechanism allowing ongoing improvement of key aspects of UGGp, including its rules, regulations and documents.

The goal of such a mechanism would be to identify and implement actions to continue improving the transparency and consistency of the programme. In particular, it should further identify means to improve the evaluator selection process (e.g. enriching the roster and diversifying profiles, ensuring the selection process is fully transparent) and improving the UGGp geopark designation process (e.g. simplifying forms and improving coherence across guidelines and forms).

Recommendation 9: Develop and adopt a tailored results framework that is based on a Theory of Change and allows for the generation of quantitative assessments of Programme activities and results.

This framework should be built on programme specific indicators and realistic / relevant targets and baseline values.

6.3 Effectiveness and Impact of the IGGP

177. Despite the lack of a formal monitoring and evaluation framework allowing to assess the extent to which the Programme reached its intended goals, the body of evidence collected through the evaluation points to valuable results, which can be directly attributed to the IGGP. For instance, IGCP is effective in that it creates scientific knowledge and human capacities that, when adopted and used beyond the scientific community, contribute to wider societal impact. As with most scientific research, there is always more to do, and that can be done, to increase the adoption of scientific outputs by 'end-users' in the public and private sectors to enhance its contribution to societal impact and the SDGs.

178. The UGGp manages a worldwide network and community of geoparks, most of which appear to be thriving and reaching their intended milestones and goals. This has been allowed by the work carried out by the Programme in terms of promoting the concept of geoparks; evaluating and selecting geoparks; designating geoparks: monitoring and revalidating geoparks; and facilitating geoparks to share best practices and exchange ideas. Geopark locations are mainly found in Europe and China, with numbers slowly growing in the Asia-Pacific, Latin America and Canada. There is great potential in Africa. SIDS appear to be off the IGGP radar as a specific target group of countries.

179. By and large, the outcomes and impact of the UGGp are in line with original expectations. Examples include the improvement of the geopark planning and management systems, which are a success factor for the achievement of other outcomes and impacts. The immediately increased visibility of the geoparks generated by access to geopark certification leads to subsequent development of sustainable tourism in the region and increased revenues for the geopark and the local population. The UGGp designation also leads to a significant increase in the links developed with other geoparks and institutions, which, in turn, leads to improved quality and performance of the geoparks. Increased understanding of the importance of geological heritage and improving general culture and knowledge of geoheritage is a major impact of the UGGp. Effective geoconservation is another impact of the UGGp coming through protection measures and strengthened research on conservation. All these developments and impacts on the local level seem to increase the pride and sense of identity of local populations.

180. IGGP supports priority target groups such as women, youth and other vulnerable populations, including indigenous populations and at-risk or isolated groups. A clear link can be drawn between the Programme's results and a number of Sustainable Development Goals.

6.4 Sustainability of the IGGP

181. The financial, operational and institutional sustainability of the Programme is mostly underpinned by the continued support provided by UNESCO, GGN and IUGS. In the short term, there does not appear to be any indication that any of these partners will withdraw their support. Financial sustainability could be strengthened, though, by bringing in additional extra-budgetary resources. For the UGGp specifically, financial sustainability could also be enhanced by enlarging the base of geoparks providing annual contributions. Operational sustainability of both pillars could be enhanced through a more pro-active involvement and empowerment of UNESCO Chairs and Category II Centres in the delivery of Programme activities.

182. The sustainability of the geoparks themselves relies heavily on the development of sustainable tourism and revenues associated with it, the subsidies from the local and national governments and grants from international sources. Ensuring intense voluntary support during the functioning of the geopark is also a factor increasing UGGp sustainability. Recently created geoparks in fragile territories appear to be the most at-risk of not being able to ensure the development of a steady stream of funding and to develop the necessary management structures on a long-term basis. As such, the Programme should pay special attention to providing support to these geoparks in setting up strong and sustainable management and financial models. Financial sustainability should also be strengthened as an evaluation and revalidation criterion.

Recommendation 10: Strengthen the longer term financial sustainability of IGGP, its sub-programmes and geoparks.

To this end, further efforts could be carried out within the UGGp to disseminate information on good practices pertaining to financial management, resource mobilisation and analyses of financial models among the geopark community.

Appendices

A. Terms of Reference of the Evaluation

Evaluation of the International Geoscience and Geoparks Programme (IGGP)

I. Background

1. The International Geosciences and Geoparks Programme (IGGP) is the only international programme of the United Nations (UN) system dedicated to earth sciences research, management, education and capacity building. It consists of two pillars: (1) the International Geoscience Programme (IGCP), which for over 40 years has brought together geoscientists from all regions of the world to study the earth and geological processes under themes with increasing societal relevance and (2) the UNESCO Global Geoparks (UGGp), which promote sites of international geological value and support local sustainable development. The governance structures, working methods and procedure of IGGP's component entities are not identical.

2. The IGCP has provided a platform for scientists from across the world to push the frontiers of knowledge forward through concrete projects. The primary aim of IGCP is to facilitate international collaboration amongst scientists from around the world in research on geological problems. Through long-term joint research efforts, meetings, field trips and workshops, IGCP aims to promote the use of geosciences in global issues including but not limited to sustainable development, the health and safety of humanity and the reduction of the adverse effects of natural disasters and resource extraction. IGCP supports work on five themes: Earth Resources: Sustaining our Society; Global Change: Evidence from the geological record; Geohazards: Mitigating the risks; Hydrogeology: Geoscience of the water cycle; and Geodynamics: Control our environment.

3. The programme builds bridges between disciplines and scientists, including young ones, with the aim to stimulate cutting-edge research and sharing scientific knowledge for the benefit of all. UNESCO is the only UN agency with a mandate to support research and capacity in geology and geophysics. For over forty years, UNESCO has worked with the International Union for Geological Sciences (IUGS) to mobilise global cooperation in the Earth Sciences through the IGCP.

4. UNESCO Global Geoparks are single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education and sustainable development. Their bottom-up approach of combining conservation with sustainable development, while involving local communities, is becoming increasingly popular. As of March 2019, there are 140 UNESCO Global Geoparks in 38 countries.

5. A UNESCO Global Geopark must contain geology of international significance. They are living, working landscapes where science and local communities engage in a mutually beneficial way. Education at all levels is at the core of the UNESCO Global Geopark concept. From university researchers to local community groups, UNESCO Global Geoparks encourage awareness of the story of the planet as read in the rocks, landscape and ongoing geological processes. UNESCO Global Geoparks also promote the links between geological heritage and other aspects of the area's natural and cultural heritage, clearly demonstrating that geodiversity is the foundation of all ecosystems and the basis of human interaction with the landscape.

6. As a global level earth science and education programme, IGGP covers a wide spectrum of initiatives and partners including Category 2 Centres such as the International Centre on Space Technologies for Natural and Cultural Heritage (HIST), the International Research Centre on Karst as well as UNESCO Chairs and UNITWIN networks. According to the 39 C/5, two expected results (ER) directly contribute to the following Sustainable Development Goals (SDG): 1, 4, 5, 6, 8, 10, 11, 12, 13, 14, 15 and 17. With relevance to SDG 5, until quite recently, women were highly under-represented in the geosciences and UNESCO has joined with geoscience unions to increase the welcome for women in this area of science. In addition, the importance of SDG 15 in addressing land degradation should be emphasised.

7. The geosciences are important for Member States in order to ensure sustainable development of their natural resources and the management of geohazards. All citizens should acquire at least some geoscientific understanding through their basic science education and understand the value of their local geological patrimony. The overall objective and activities of the IGGP focus on building human and institutional capacities in order to efficiently harnessing research knowledge, technology transfer

and sharing, promoting geoscience education at all levels, and for promoting the use of promising advances in the geosciences in order to address the sustainable development challenges of society, with an emphasis on UNESCO's two global priorities Africa and Gender Equality.

8. On request of the Natural Sciences Sector, which houses the IGGP within UNESCO, the UNESCO Internal Oversight Service (IOS) Evaluation Office will undertake an independent evaluation of the IGGP (see 2017 IOS Annual Report, Annex II, p. 2 presented at the 204th Session of the Executive Board). These terms of reference outline the characteristics of the first stand-alone independent evaluation of the IGGP.

9. In terms of regular programme staffing, the geoscience unit currently has five professional posts (one a secondment) in Headquarters. The Sector has 44 professionals in Field Offices, some of whom contribute to IGGP activities and one of whom has a doctoral degree in geoscience. In the 39 C/5 integrated budget framework, the regular programme funds amount to US$ 796,000 for ER4 and US$ 389,000 for ER6, respectively.

10. To conduct this evaluation, UNESCO IOS Evaluation Office seeks to recruit a suitable consultant / consultancy team as per the parameters set out below.

II. Purpose and Use

11. This evaluation project aims to assess and analyse the relevance, effectiveness, impact, efficiency and sustainability as well as existing and potential partnerships and (prospects for increased) co-operation of UNESCO's current work in the geosciences in its Member States through the IGGP, including taking stock, in its early phase of development, of the state of the Geoparks label, in order to ensure:

    a. Learning: Through this assessment and the subsequent analysis, a detailed view will be obtained not only of what works well and why within the IGGP, but also how the functioning of the programme can be improved in any of its dimensions. If the evaluation findings include elements to improve the functioning of the programme, learning may occur.

    b. Accountability: Several stakeholders are involved directly or less directly with the IGGP and provide support through funding or in-kind. It is important that stakeholders see that value is achieved in exchange for their investments.

12. In pursuit of the main evaluation purposes, the evaluator(s) are expected to draw conclusions, formulate lessons learnt and articulate recommendations, based on their assessment and analysis. They should provide evidence to Member States and donors about key achievements and added value of each main component of the geosciences work of UNESCO and provide evidence of the contribution the programmes are making to the SDGs, the Sendai Framework and the African Union's Agenda 2063. These elements will facilitate accountability and learning by the primary and secondary target audiences of the evaluation.

13. The target audiences for this evaluation consist, primarily, of the IGGP, i.e. the geosciences unit within the Division of Ecological and Earth Sciences at the UNESCO Natural Sciences Sector; the several entities composing the IGGP (including the Councils and the Bureaus of IGCP and UGGp as well as the regional representations); Geoparks; and Member States and, as secondary stakeholders, donors, civil society organisations, wider academic and policy communities and the communities around Geoparks.

14. The evaluation recommendations (see § 12) will be followed up by a management response and an action plan from the Sector, which will outline concrete actions taken to be taken, by specific actors in a given time-frame. Therefore, the evaluation is expected to lead to tangible outcomes within a clearly defined time as well as generate spaces for (self-) reflection by the wider IGGP community, including the Secretariat and governing bodies.

III. Scope

15. The scope of this evaluation encompasses the full IGGP, including its two pillars (the IGCP and UGGp), as one contiguous entity. It is understood that the IGCP and UGGp although having different governance arrangements supplement one another. For example, the IGCP may be considered the fundamental sciences wing of the IGGP, while the UGGp might be seen as an applied sciences wing. More precisely, the evaluation will address all relevant constituent parts of the IGGP, including the Secretariat, its governance architecture, Geoparks and others. It will address geoscience capacity building, international science co-operation and networking aspects of all of UNESCO's work in the geosciences as mentioned in the previous section. It will include Category 2 Centres to assess their added value and effectiveness, efficiency, impact and sustainability of activities in Member States.

16. In terms of time-frame, the evaluation will address the IGGP from its establishment to the present but with a focus on its last 10 years of activity since the 34 C/4 Evaluation of UNESCO's Evaluation of Strategic Programme Objectives (SPO) 3: 'Leveraging scientific knowledge for the benefit of the environment and the management of natural resources' in 2009, and Strategic Programme Objective 5: 'Contributing to disaster preparedness and mitigation' in 2010. The findings of the evaluations of SPO 3 and 5 shall, to the extent possible, provide the baseline for assessing the evolution and implementation of the relevant recommendations. In the case of Geoparks, this evaluation will not address the time prior to its incorporation into UNESCO. In general, the evaluation will adopt a retrospective and forward-looking perspective with action-oriented recommendations formulated on the basis of substantive findings.

17. IGCP on its own was evaluated last in 2004, when it was located within the Division of Earth Sciences, and then as part of the evaluation of UNESCO SPO 3 in 2009, under the oversight of the UNESCO Internal Oversight Service (IOS). This last evaluation includes relevant findings, which should be taken into account by the evaluator(s). Several past activities of the unit have been discontinued in the shift from earth science to geoscience, including those on space education, the Geological Application of Remote Sensing Programme, the Open Initiative on the Use of Space Technologies to Support the Monitoring of UNESCO Natural and Cultural Heritage, the Space Education Programme and support to the Global Terrestrial Observation System. UNESCO's severe budget shortfalls have led to downsizing the scope of the geoscience work at UNESCO since 2005, despite calls from the scientific press on the importance of the earth sciences.

IV. Evaluation dimensions and questions

18. In order to achieve these purposes, the evaluation will answer the following main questions pertaining to the above-mentioned (see § 11) evaluation dimensions:

a. Relevance of UNESCO's work in the geosciences and geoheritage (extent to which there is a demand for this work) and alignment with other activities:

i. To what extent are interventions and outcomes of the IGGP perceived as beneficial to Member States' needs and priorities?

ii. What subject areas should be maintained as priority focus areas (under the current restricted resource scenario) in light of the 2030 Agenda?

iii. To what extent have issues related to inclusion of disadvantaged groups, youth and UNESCO's priorities Africa and Gender Equality been reflected in the work of the IGGP?

iv. What has been the added value of this strand of work for the achievement of Sector objectives?

b. Efficiency of the IGGP's work in the geosciences and geoheritage (extent to which resources are used cost effectively) including organisational setting and governance mechanisms and processes:

i. Which characteristics does UNESCO have that enable it to operate cost effectively compared with other actors working in science and development that contribute to the 2030 Agenda for Sustainable Development in this field?

ii. Are the resources invested in the geosciences and geoheritage work used responsibly and do they generate appropriate value for money?

iii. What measures could lead to increased synergies and cost efficiencies?

iv. Which management, operational and governance arrangements are optimal for IGCP and UGGp, including their Councils, and which is the ideal distribution of roles and responsibilities at UNESCO Headquarters and Field Offices for efficient planning, implementation and monitoring of activities?

c. Effectiveness and **impact** of UNESCO's work in geosciences and geoheritage (results):

i. What have been the key outputs of the IGGP?

ii. Does the current monitoring framework allow capturing the results at the different levels of intervention?

iii. To what extent have interventions led to outcomes, for example, in terms of increased capacities in research and education at institutional and individual levels? How have contextual variables interacted with these results?

iv. What difference has UNESCO's work in geoscience made at the country level to ultimate beneficiaries, including with a view to inclusion of disadvantaged groups and of girls and women?

d. Sustainability of UNESCO's work in the geosciences and geoheritage (extent to which benefits are likely to be maintained after funding is withdrawn and potential for further development and scaling up):

i. Has UNESCO's work in geoscience and geoheritage contributed or is it likely to contribute to long-term effects for individuals, organisations and institutions?

ii. What measures would be required to better ensure ownership and financial, political and institutional sustainability of IGGP benefits?

e. Partnerships and **cooperation** for UNESCO's work in the geosciences and geoheritage (extent to which cooperation is sought and effective):

i. To what extent have partnerships been sought and established and synergies been created in the delivery of assistance at the country level?

ii. Are there potential synergies or complementarities with specialised projects, networks, institutions or partners that have not yet been optimally exploited (i.e. ICSU, IUGS, additional unions)?

V. Methodology

19. This evaluation project will rely on a generic, non-experimental evaluation design. In submitting offers, the use of innovative methodologies such as outcome harvesting or collaborative outcomes reporting will be valued. In particular, proposals for quantitative assessments of outcomes and impact will be gratefully received. The proposed design will include several of the following methods of data collection:

a. An extensive **document review** (compulsory). An in-depth study of foundational documents pertaining to governance arrangements is of specific importance. This documentation will be agreed at the start of the assignment.

b. A **Theory of Change workshop** (compulsory) with the designated evaluation reference group (see Section V, below).

c. **Semi-structured interviews** (compulsory) with key stakeholders (face to face / phone / Skype) and beneficiaries. Based on the theory of change, these may include UNESCO current and former staff members and consultants; relevant government officials including UNESCO National Commissions; IGCP and UGGp Council Members; university representatives; scientific unions; international and intergovernmental programmes; research institutions and networks; non-government organisations (NGOs); Category 2 Centres; UNESCO Chairs; IGCP and other project grant awardees; ultimate beneficiaries, including the communities around Geoparks.

d. An **online survey** (optional) directed at similar stakeholders as the ones mentioned under 19.c above.

e. **Academic influence and use analysis** (optional): a bibliometric analysis of academic databases, media analysis and Internet searches to assess the increase in geoscience publications by scientists in Member States having received UNESCO assistance.

f. **Field mission(s)** (optional) to allow for **direct observation** at sites where the IGGP works, for example, Geoparks and their communities. This might include a mission to a relevant location in sub-Saharan Africa.

g. Other methods that the evaluator(s) may propose (optional).

20. The team is expected to travel to Paris at least twice: to participate in a kick-off meeting during the inception phase and for a stakeholder workshop to present the draft final report. In addition, it should budget for a mission to Lombok, Indonesia (September 2019) to attend the 6th Asian Pacific Geoparks Network Symposium and the 3rd Geoparks Evaluator's Seminar. Travel costs are to be included in the financial proposal.

21. The evaluator(s) should submit an inception report at the end of the initial stage of the evaluation to develop and agree upon the detailed methodological approach and work-plan.

22. The evaluation team will comply with United Nations Evaluation Group (UNEG) Norms and Standards for Evaluation, UNEG Guidelines for Integrating Human Rights and Gender Equality in Evaluations and UNEG Ethical Guidelines for Evaluation.

VI. Roles and Responsibilities

23. The evaluation will be managed by UNESCO's Internal Oversight Service (IOS) and conducted by a(n) (team of) external consultant(s). The evaluator(s) is / are expected to contribute specific expertise in the field of evaluation and, desirably, knowledge of the global geoscience landscape. IOS is responsible for the quality assurance of all deliverables. The evaluation team will be expected to develop a detailed evaluation methodology, collect and analyse data in line with this methodology and to prepare the draft and final reports in English. The evaluation team will keep the evaluation manager informed of their progress through periodic calls and will advise of any obstacles or risks in good time.

24. An evaluation reference group will be established to accompany the evaluation process and provide feedback on the Inception Report and draft Evaluation Report. The reference group will consist of members from the Division of Ecological and Earth Sciences, the Executive Office of the Science Sector, Field Offices, IGCP and UNESCO Global Geoparks. The reference group shall meet periodically during the evaluation, as necessary.

25. The evaluation team will commonly be responsible for their own logistics: office space, travel, administrative and secretarial support, telecommunications, printing of documentation, etc. Suitable office space will be provided for the consultants when they are working from UNESCO premises. The evaluation team will also be responsible for administering all methodological tools, such as surveys. The Sector will provide access to all relevant documentation and contact details of relevant stakeholders and distribution lists. It will also facilitate access to UNESCO staff at both Headquarters and Field Offices.

VII. Qualifications of the team

26. This concerns an assignment for an individual or team with an expected level of effort of around 60 days senior staff time and 30 days junior- to mid-level staff time. The team leader is expected to have the following mandatory qualifications and experience:

- Broad expertise in programme evaluation, with a minimum of seven years of professional experience in this field demonstrating a strong record of accomplishment in designing, implementing and leading evaluations.
- At least some programme evaluation experience with relevance to the Natural Sciences Sector.
- Excellent language skills in English (oral communication and report-writing) and at least good language skills in French (reading and oral communication).
- No previous involvement in the implementation of the activities under review.

27. In addition, s/he or any other member of the team will ideally have the following desired qualifications:

- An advanced university degree with a specialisation in a geoscience, closely related field or other subject relevant to the Natural Sciences Sector.
- Knowledge of the role of the UN and its programming.
- Experience with assignments for the UN.
- Understanding and application of UN mandates in Human Rights and Gender Equality.
- Strong analytical and writing skills.
- Other UN language skills (Spanish, Arabic, Russian and Chinese) will be considered an asset.

28. Verification of these qualifications will be based on the provided curriculum vitae and may include a reference check. Thus, the names, titles and contact details of two references should be provided that can attest to the mandatory qualifications and experiences mentioned above. Moreover, a web-link to or electronic copy of one recently completed report with relevance to the assignment should be provided with the technical proposal.

VIII. Deliverables and schedule

Deliverables

29. The assignment will consist of the following main deliverables:

    a. The inception report. This report will outline the detailed methodological approach to taking on the assignment and outline when and how the activities for this will be undertaken (work-plan) (max. 15 pp. excluding annexes);

    b. The draft evaluation report. This report will be formatted in the UNESCO IOS Evaluation Office template for evaluation reports and report on (a) the evaluation background, including a description of the evaluand; (b) the evaluation methodology, including theory of change and evaluation matrix; (c) the evaluation findings; (d) conclusions and lessons learnt and (e) recommendations. In addition, it will include an Executive Summary of 2-4 pages (max. 40 pp. excluding annexes);

    c. The final evaluation report. This will follow the UNESCO IOS Evaluation Office guidelines.

Schedule

30. The evaluation is expected to start in July 2019 and be concluded by December 2019. The indicative timetable of key activities and deliverables is shown below:

Activity / Deliverable	Foreseen date
Recruitment & preparation	Mid-July 2019
Initial workshop (ToC)	End July 2019
Inception report	Early August 2019
Data collection & field visits	Late August – end-September 2019
Data analysis	October 2019
Write-up	Late October 2019
Stakeholder workshop (review of draft report)	Early November 2019
Revision	Late November 2019
Final report	Early December 2019
Follow-up	Late December 2019 and on

IX. References

UNEG (2017). Norms and Standards for Evaluation. New York City: United Nations Evaluation Group. Retrieved 15 May 2019 from: http://www.unevaluation.org/document/download/27

UNEG (2014). Integrating Human Rights and Gender Equality in Evaluations. New York City: United Nations Evaluation Group. Retrieved 15 May 2019 from: http://www.unevaluation.org/document/download/2107

UNEG (2008). UNEG Ethical Guidelines for Evaluation. New York City: United Nations Evaluation Group. Retrieved 15 May 2019 from: www.uneval.org/document/download/548

B. Appendix B. Evaluation matrix and questions

Key evaluation question	Sub-questions	Evaluation task addressing the evaluation questions
KEQ1. Relevance: To what extent is UNESCO's work in the geosciences and geoheritage relevant (vis à vis existing needs and demand) and aligned with other activities implemented by UNESCO and other partners?	- SQ1.1: To what extent are interventions and outcomes of the IGGP perceived as beneficial to Member States' needs and priorities? - Is there a demand for this work and how is it evolving?	- Interviews with permanent delegations - On-line survey of IGCP and UGGp national commissions
	- SQ1.2. What subject areas should be maintained as priority focus areas (under the current restricted resource scenario) in light of the 2030 Agenda? - Are there subject areas which are not relevant anymore and should be removed? - Are there subject areas which are much more important than others?	- Interviews with UNESCO staff and members of the programme governance (e.g. Council and Bureau members)
	- SQ1.3. To what extent have issues related to inclusion of disadvantaged groups, youth and UNESCO's priorities Africa and Gender Equality been reflected in the work of the IGGP? - What is the evolution of the demographics of project participants?	- IGGP output and outcome analysis - On-line survey targeting grantees and geoparks - Interviews with UNESCO staff
	- SQ1.4. What has been the added value of this strand of work for the achievement of Sector objectives?	- Interviews with UNESCO staff
KEQ2. Efficiency: To what extent are the resources used to implement the programme aligned with its objectives and expected results? (including organisational setting and governance mechanisms and processes)	- SQ2.1. Which characteristics does UNESCO have that enable it to operate cost effectively compared with other players in science and development who contribute to the 2030 Agenda for Sustainable Development in this field? - Are there any characteristics which are an obstacle for a cost effective operation?	- Interviews with UNESCO staff - Interviews with GGN
	- SQ2.2. Are the resources invested in the geosciences and geoheritage work used responsibly and generate appropriate value for money? - Is there evidence to the contrary in some cases?	- On-line survey targeting grantees and geoparks - Analysis of SISTER data - Case studies
	- SQ2.3. What measures could lead to increased synergies and cost efficiencies?	- Interviews with UNESCO staff and GGN - Interviews with National Commissions and national committees
	- SQ4. What are the optimal management, operational and governance arrangements for the IGCP and UGGp (including their Councils), and distribution of roles and responsibilities at UNESCO Headquarters and Field Offices for efficient planning, implementation and monitoring of activities?	- Interviews with UNESCO staff and GGN - Interviews with National Commissions and national committees

KEQ3. Effectiveness and impact: Has UNESCO's work in geosciences and geoheritage been effective and has it led to tangible results which are in line with original expectations?	- SQ1: What have been the key outputs of the IGGP as well as outcomes and results?	- Interviews with UNESCO staff and GGN - Interviews with geoparks and IGCP grantees - On-line survey targeting grantees and geoparks
	- SQ2. Does the current monitoring framework allow capturing the results at the different levels of intervention?	- Interviews with UNESCO staff and GGN - Case studies
	- SQ3. To what extent have interventions led to outcomes, for example, in terms of increased capacities in research and education at institutional and individual levels? How have contextual variables interacted with these results?	- Case studies - Interviews with grantees and geoparks - On-line survey targeting grantees and geoparks
	- SQ4. What difference has UNESCOs work in geoscience made at the country level to ultimate beneficiaries, including with a view to inclusion of disadvantaged groups and of girls and women?	- Interviews with National Commissions and National Committees - On-line survey targeting grantees and geoparks
	- SQ5. What contributions is the IGGP making to the SDGs, the Sendai Framework and the African Union Agenda 2063?	- On-line survey targeting grantees and geoparks
KEQ4. Sustainability: What is the potential for further development and scaling up of the benefits of the IGCP and UGGp activities in the medium-to-long-term?	- SQ1. Has UNESCO's work in geoscience and geoheritage contributed or is it likely to contribute to long-term effects for individuals, organisations and institutions? - If this is the case, would these be sufficient to maintain results after end of funding for IGCP and after the designation of a geosite for the UGGp?	- Interviews with UNESCO staff and GGN - Interviews with National Commissions and national committees
	- SQ2. What measures would be required to better ensure ownership and financial, political and institutional sustainability of IGGP benefits?	- Interviews with UNESCO staff and GGN - Interviews with National Commissions and national committees - On-line survey targeting grantees and geoparks
KEQ5. Partnership and cooperation: To what extent are partnership and cooperation sought after and effective?	- SQ1. To what extent have partnerships been sought and established and synergies been created in the delivery of assistance at the country level? - Is there sufficient evidence for joint action at the country level?	- Interviews with UNESCO staff and GGN - Interviews with National Commissions and national committees - On-line survey targeting grantees and geoparks - Case studies
	- SQ2. Are there potential synergies or complementarities with specialised projects, networks, institutions or partners that have not yet been optimally exploited (i.e. ICSU, IUGS, additional unions)?	

C. Appendix C. Detailed presentation of the IGCP

C.1 International Geoscience Programme (IGCP)

The IGCP aims to foster collaborative projects that prioritise capacity building, benefit to society and cooperation between scientists, in particular, international participation, including scientists from developing countries. As other programmes of UNESCO, the call for projects emphasises the involvement of women and young and early career scientists, who are especially encouraged to apply.

The programme has partnered since 1972 with the International Union of Geological Sciences (IUGS), that brings together geologist from 117 countries and since 2018, with the Jeju Province Development Corporation (JPDC) of the Republic of Korea and the UNESCO National Commission for the People's Republic of China, to fund grants for projects. In the past, the programme also received considerable support from the United Kingdom and the United States.

The projects address geosciences within their five themes: earth resources; global change; geohazards; hydrogeology and geodynamics. Overall, IGCP pursues four broad objectives:

- Improving our understanding of the geoscientific factors affecting the global environment in order to improve human living conditions;
- Developing more effective methods to find and sustainably exploit natural resources of minerals, energy and groundwater;
- Increasing understanding of geological processes and concepts of global importance, including an emphasis on socially relevant issues; and,
- Improving standards, methods and techniques of carrying out geological research, including the transfer of geological and geotechnical knowledge between industrialized and developing countries

Since its creation in 1972, the Programme has supported more than 350 projects. The call for projects opens every year providing funding for about 8-10 new projects per year which have a lifetime of maximum five years (IGCP, 2018). At any one time there are 25-30 projects in progress. The IGCP Council, supported by the Scientific Board, is responsible for evaluating project proposals according to the IGCP Guidelines.

C.2 UNESCO Global Geoparks programme (UGGp)

The UNESCO Global Geoparks, is a global network of sites of geological value that promotes conservation tied to scientific research and the engagement of local communities to enhance sustainability. UNESCO began cooperating with geoparks in 2001. Later, in 2004, 17 European and 8 Chinese geoparks met at UNESCO Headquarters in Paris to form the Global Geoparks Network (GGN), in which national geoparks initiatives join in a global network of exchange and cooperation. These efforts resulted in the creation in 2015 of the UNESCO Global Geoparks, with the support of the 195 member countries which expresses the importance for governments of managing unique geological sites and landscapes holistically.

To date, there are 147 UNESCO Global Geoparks in 41 countries. Every year the applications are open for aspiring UNESCO Global Geoparks that must submit an expression of interest together with an application form. The applications go through an evaluation process based on a desktop geo-scientific evaluation from IUGS for the international value of geological heritage as well as a field evaluation by independent experts who have proven professional experience relevant for the UNESCO Global Geopark development. Each UNESCO Global Geopark is revalidated every 4 years for quality assurance purposes.

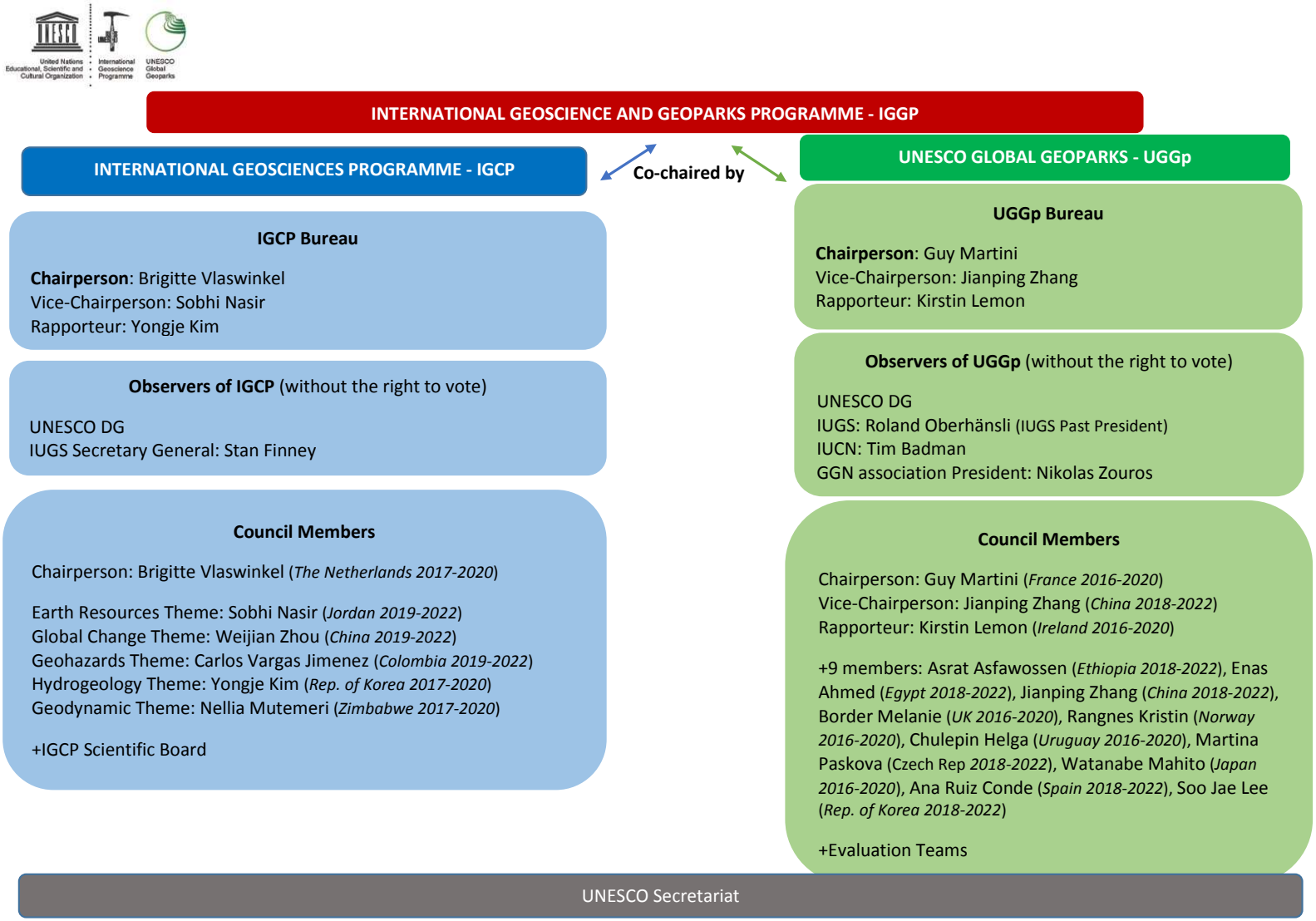
The UGGp supports Member States' efforts to establish UNESCO Global Geoparks all around the world, in close collaboration with the GGN. As a network, every two years, representatives of all UNESCO Global Geoparks meet at the Global Geopark Network Conference to work together and exchange ideas of best practices and join in common projects to improve the quality of the label UNESCO Global Geopark. There are also three regional networks (Asia, Europe and Latin America and the Caribbean). The Asian and European networks meet twice a year to develop and promote joint activities.

At the national level, some countries have IGCP National Committees, which represent IGCP and coordinate the IGCP-related outreach activities in the country to grow linkages of the national geological institutions and individuals with the international scientific community, and National Geopark Committees, responsible for coordinating Geoparks at national level. Currently, there are 25 IGCP National Committees and 23 National Geopark Committees.

C.3 Governance structure

The IGGP is co-chaired by the IGCP and the UGGp and supported by the UNESCO Secretariat (Figure 1). Each Programme has a Bureau, a group of observers and a Council. While the IGCP has a scientific board, the UGGp also relies on its network of geopark evaluators. Both programmes have a national presence through national committees.

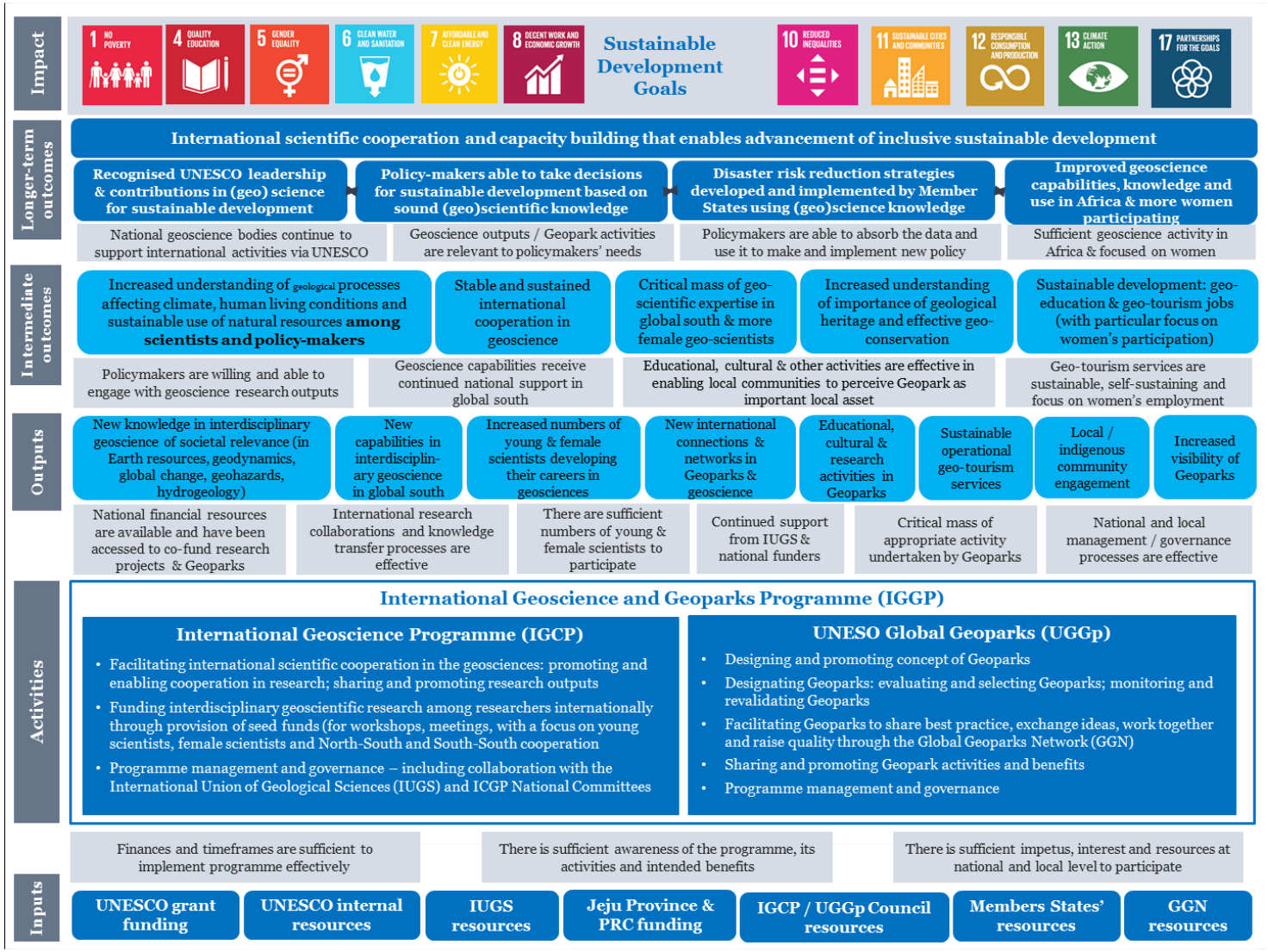
Figure 9 IGGP Governance structure



Source : UNESCO

C.4 The IGGP Theory of Change

There was no existing Theory of Change (ToC) for IGGP. Therefore, for the purpose of this evaluation, the evaluation team has developed a ToC for IGGP which is presented in the following figure. This ToC has been developed on the basis of the desk research carried out during the inception phase as well as initial interactions and interviews with programme stakeholders. The ToC was presented and discussed during the evaluation kick-off meeting and ToC workshop that took place at UNESCO headquarters on 10 September 2019. This resulted in some modifications to the ToC and these are included in the figure . There was general agreement at the workshop that the ToC reflected the programme. The ToC was constructed for the purpose of the evaluation. The present evaluation was meant to test this ToC and lead to recommendations to potentially improve it.



D. Appendix D. Overview of on-line survey results

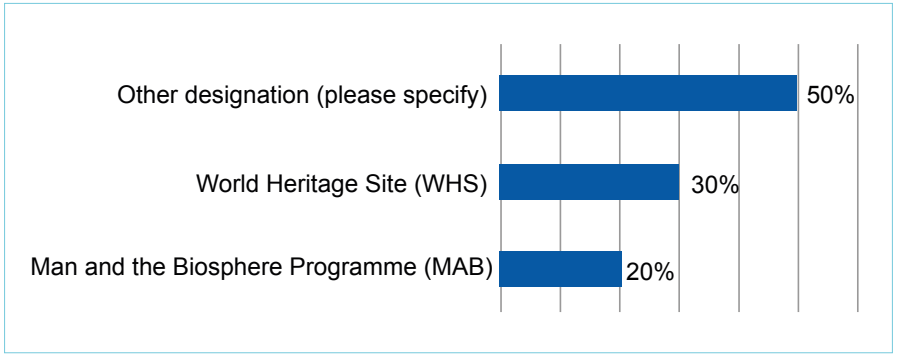
A1. Results of the survey for UNESCO Global Geoparks

Number of parks that took the survey:103

Percentage of parks that took the survey over the total number of UGGp: 70%

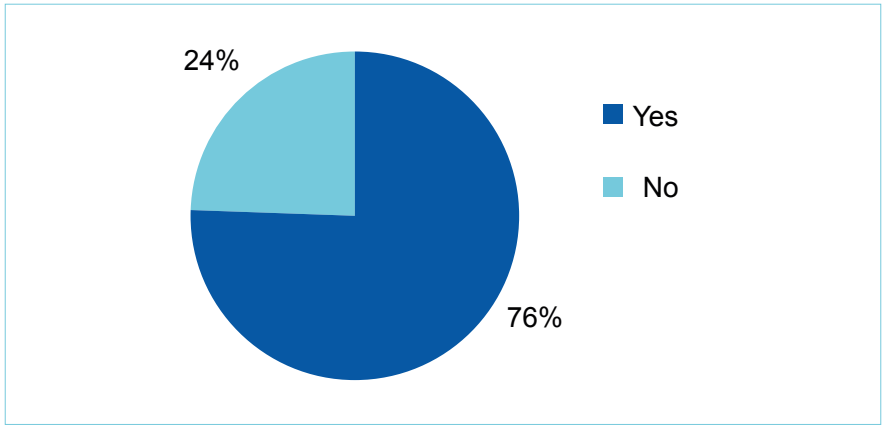
Q5. Does your geopark have other designations besides an UNESCO Global Geopark designation?

Number of responses: 96



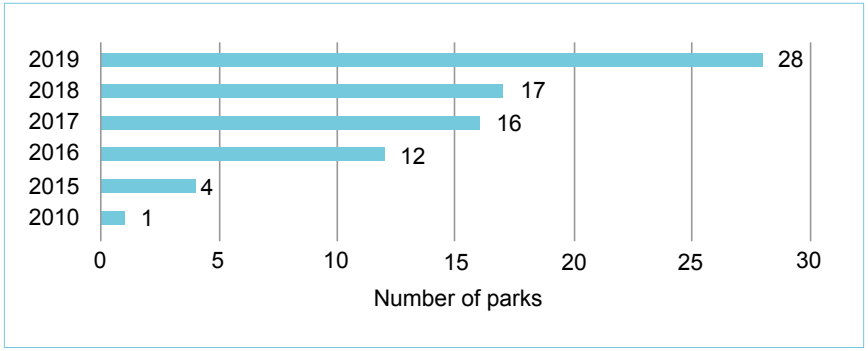
Q6. Has the UNESCO Global Geopark designation ever been revalidated?

Number of responses: 103



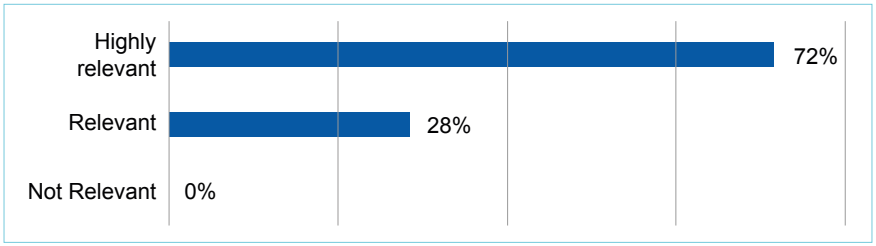
Q7. If yes, please indicate when the designation has been revalidated

Number of responses: 78

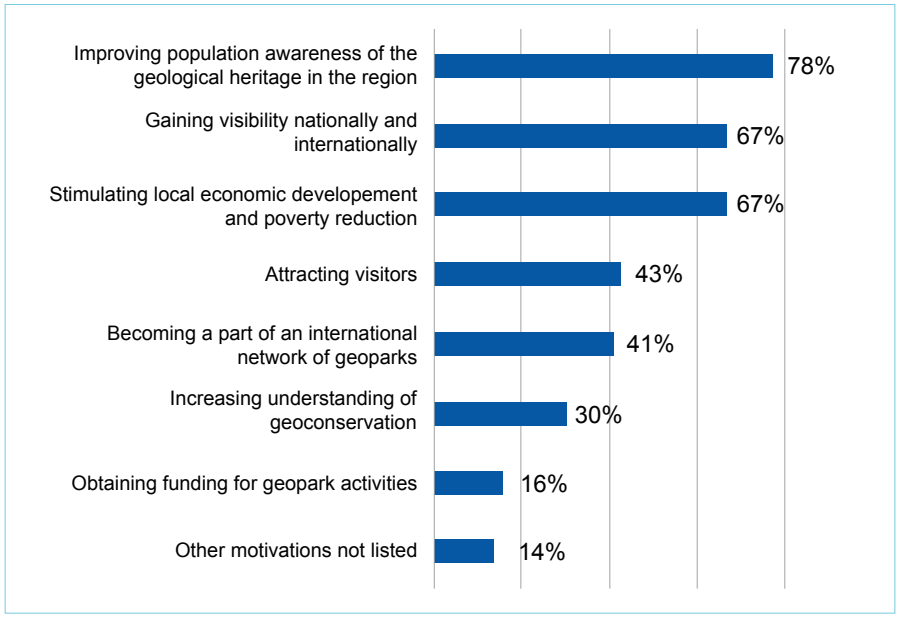


Relevance

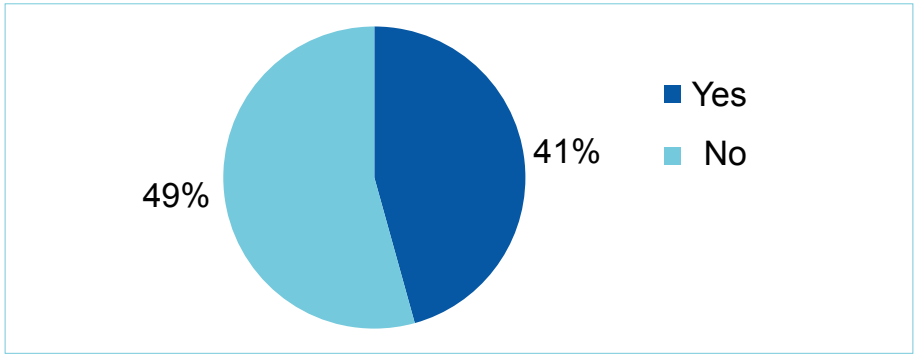
Q8. How relevant is the designation of your geopark as an UNESCO Global Geopark with regards to local needs?
Number of responses: 102



8. What motivated your geopark to seek the UNESCO Global Geopark designation? Please indicate the top three motivations

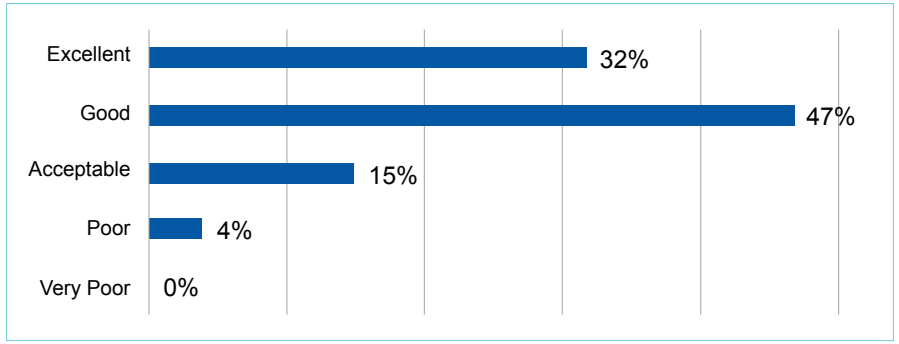


Q10. Was the effort to obtain the UNESCO Global Geopark designation part of a national strategy to enhance geoheritage protection?
Number of responses: 103

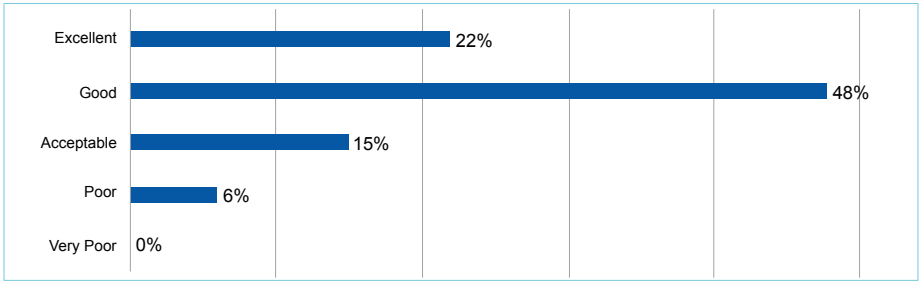


Process / transparency and soundness

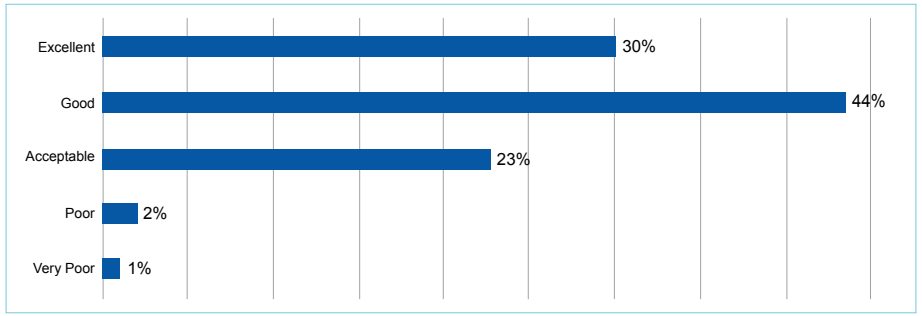
Q11. How would you rate the transparency of the UNESCO Global Geopark designation process (including evaluation mission)?
Number of responses: 98



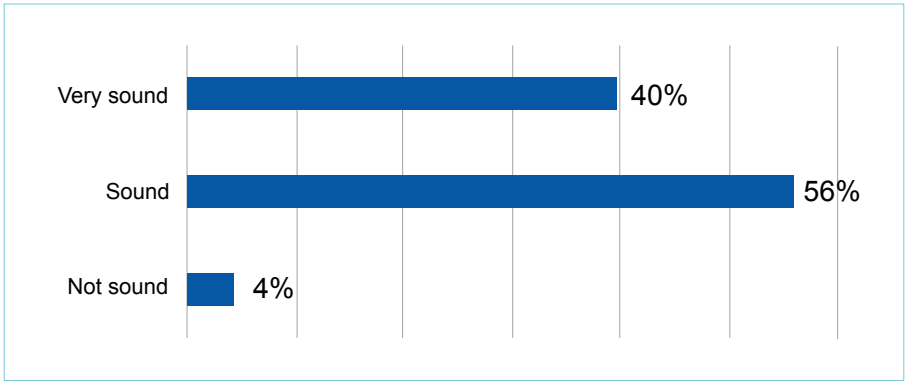
Q12. How would you rate the transparency of the re-validation process?
Number of responses: 91



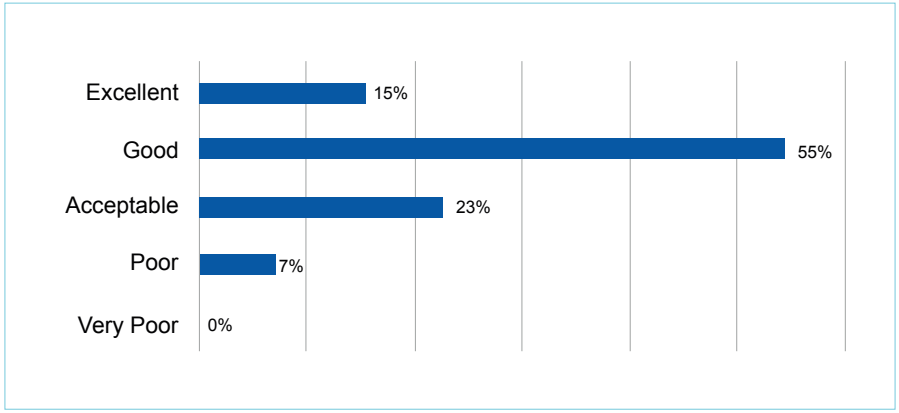
Q13. How would you rate the technical and scientific soundness of the UNESCO Global Geopark designation process (including evaluation mission)?
Number of responses: 96



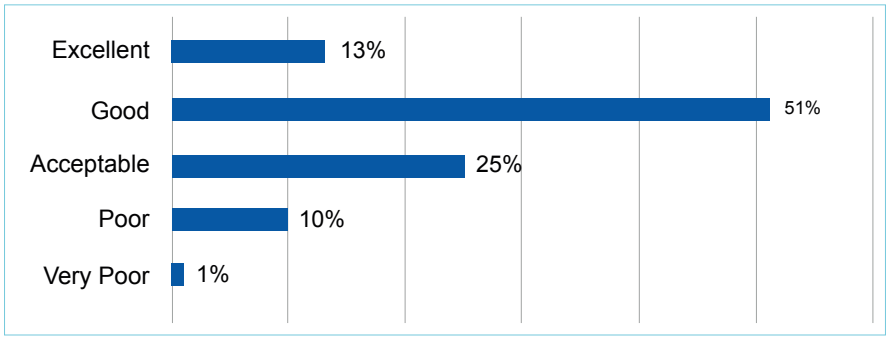
Q14. How would you rate the technical and scientific soundness of the re-validation process?
Number of responses: 91



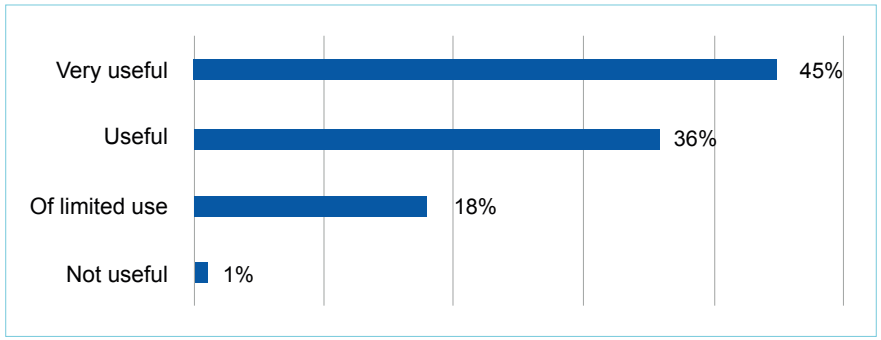
Q15. How would you rate the efficiency (i.e. timeliness, simplicity) of the UNESCO Global Geopark designation process (including evaluation)?
Number of responses: 97



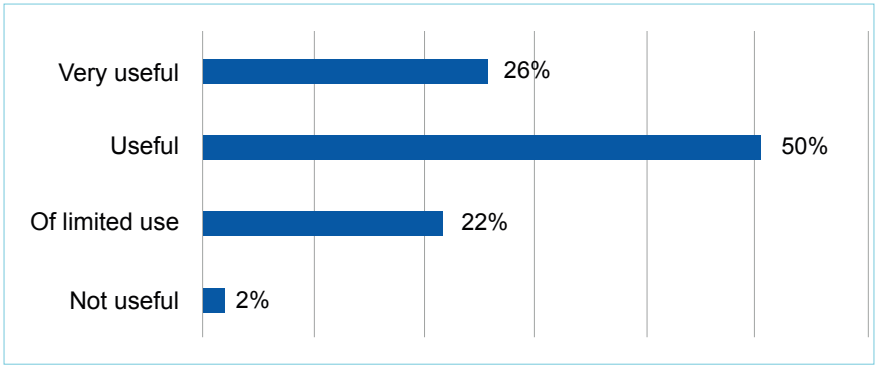
Q16. How would you rate the efficiency (i.e. timeliness, simplicity) of UNESCO Global Geopark revalidation process?
Number of responses: 92



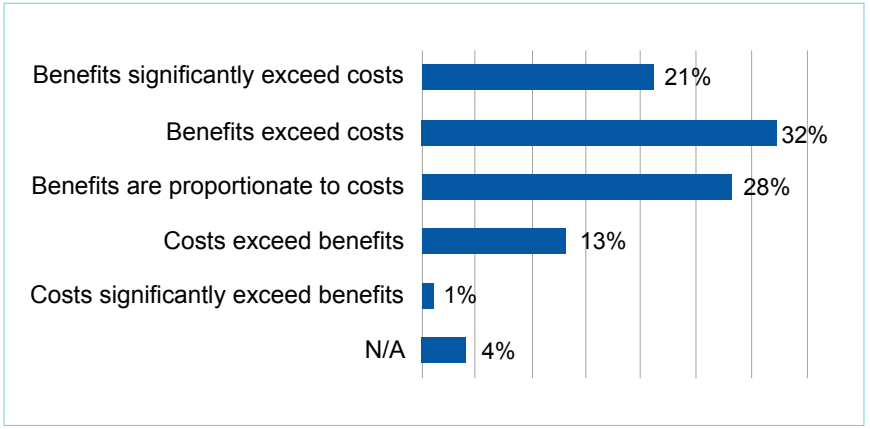
Q17. How useful is the support provided by the Global Geoparks Network (GGN) to your geopark?
Number of responses: 100



Q18. How useful is the support provided by the UGGp Secretariat to your geopark?
Number of responses: 103

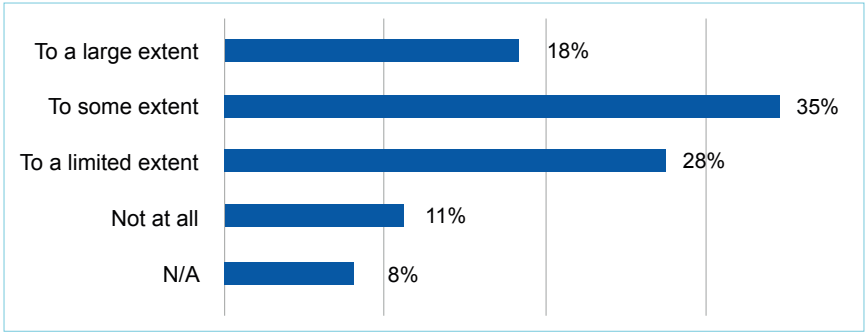


Q19. How would you rate the overall cost-benefit relationship between all costs related to UNESCO Global Geopark designation and all benefits?
Number of responses: 101

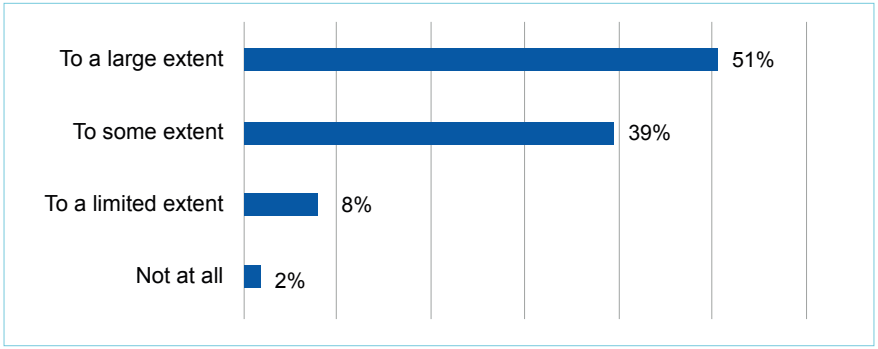


Value added of evaluation and re-validation

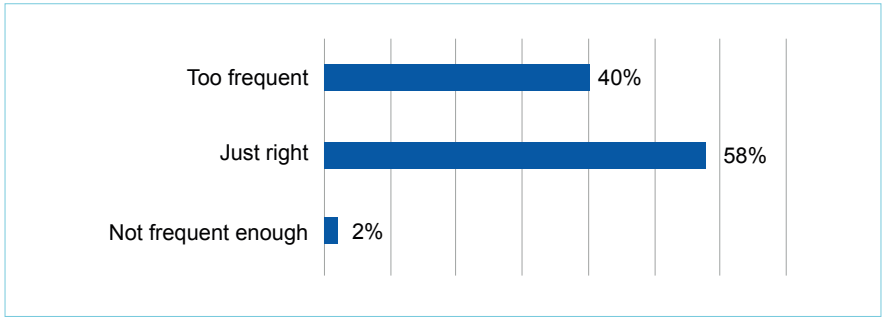
Q20. To what extent has the UNESCO global geopark designation led your geopark to be more mindful of issues relating to inclusion of disadvantaged groups (i.e. indigenous people, people with disabilities, etc.)?
Number of responses: 98



Q21. To what extent has your geopark improved its quality/performance thanks to the recommendations issued after evaluation and/or revalidations?
Number of responses: 101

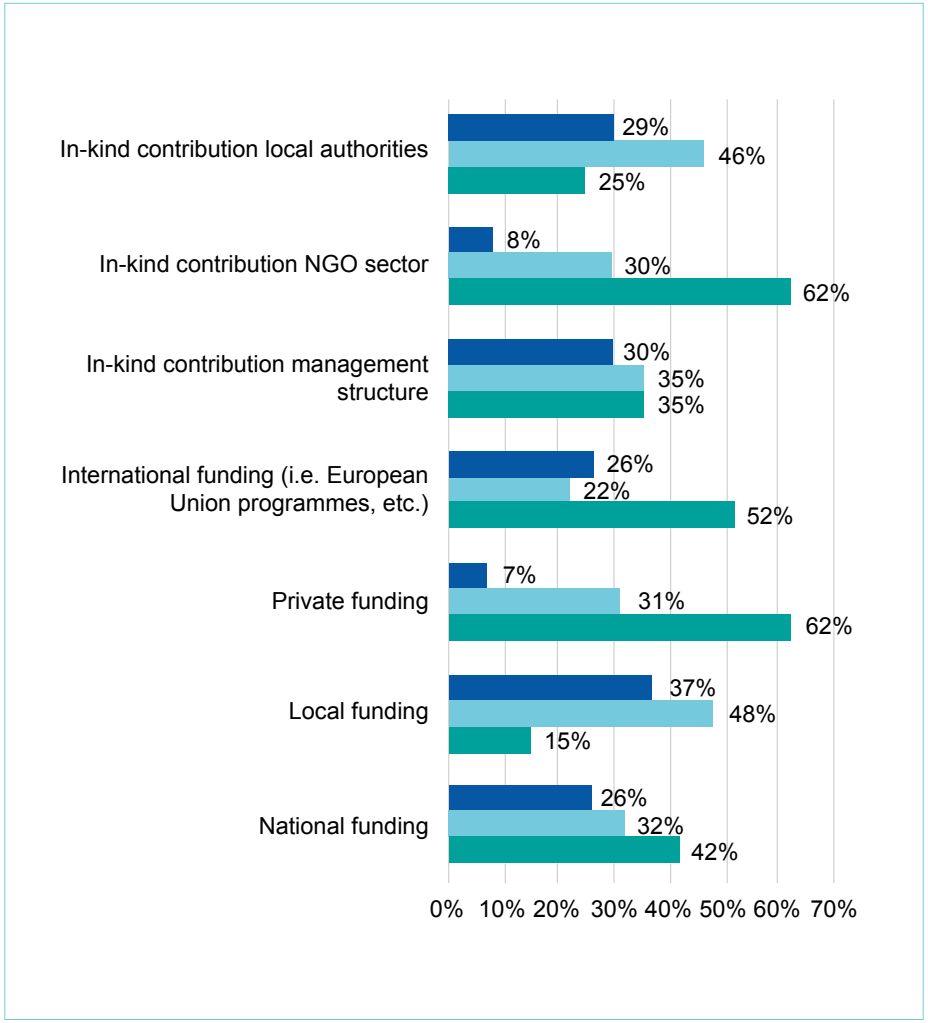


Q22. How would you rate the frequency of the re-validation procedure?
Number of responses: 99

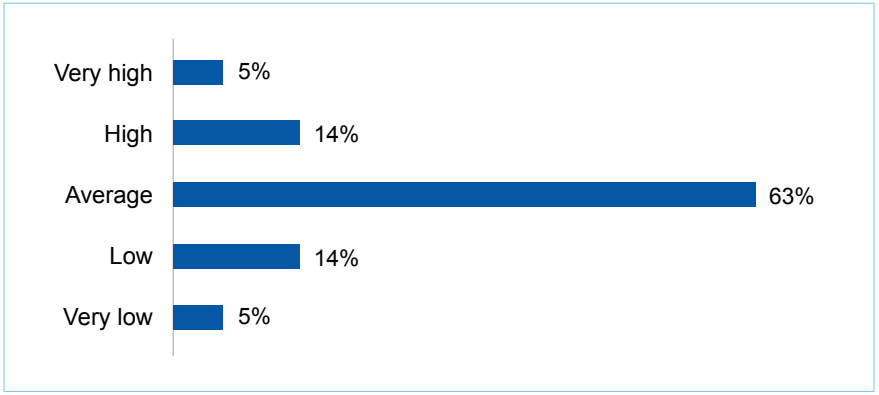


Input

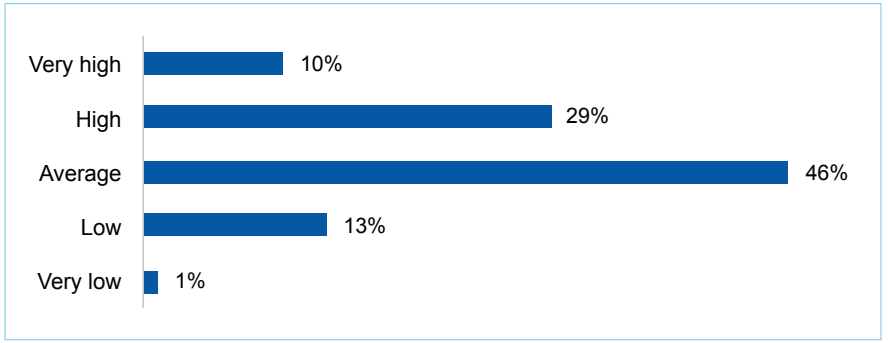
Q23. What has been the size of contribution received by the geopark as a result of UNESCO Global Geopark designation from the following sources?



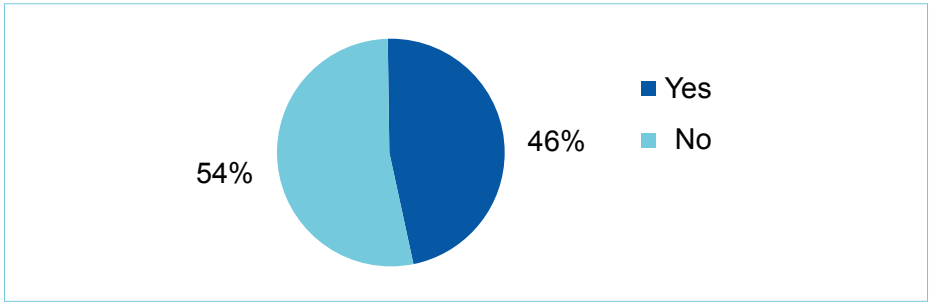
Q24. What is the level of burden for your geopark of the yearly $1,500 USD contribution made to the GGN?
Number of responses: 98



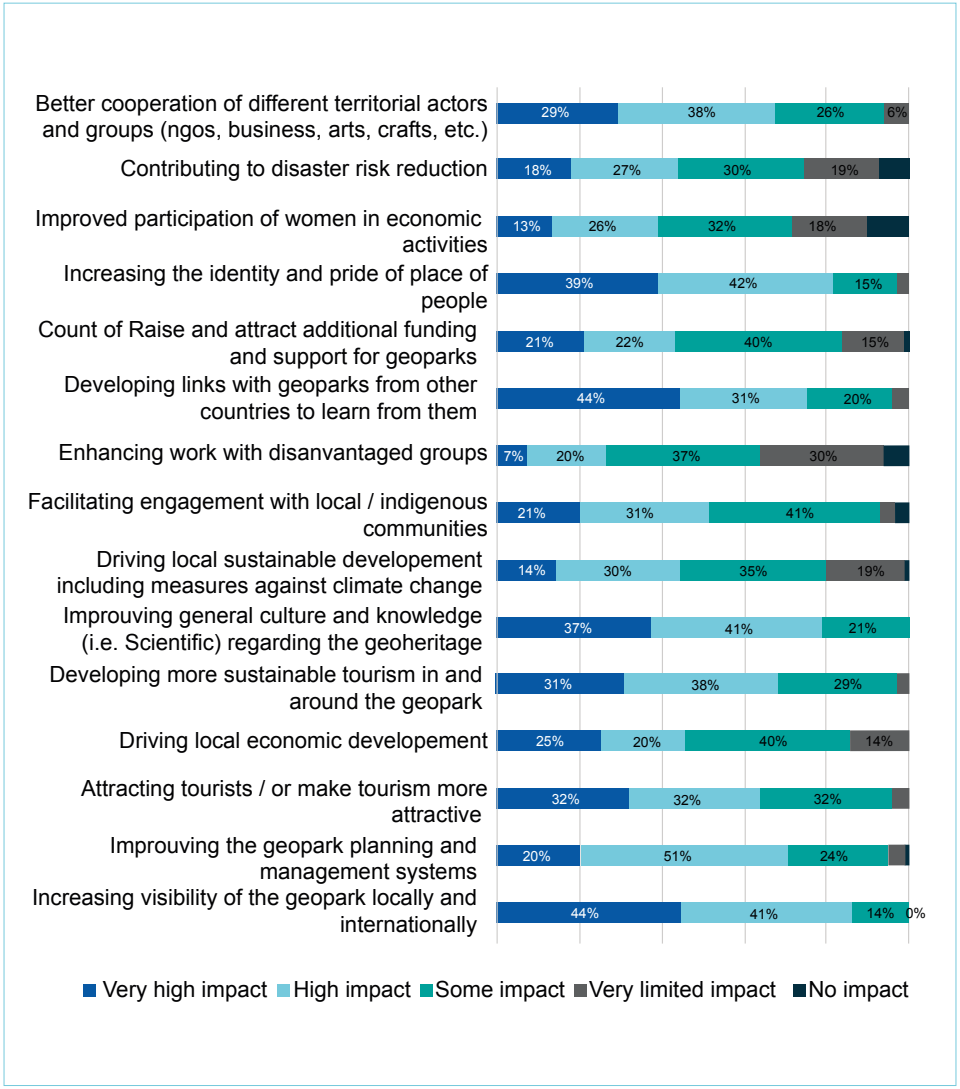
Q25. How would you describe the value-for-money of your contribution to the GGN ?
Number of responses: 101



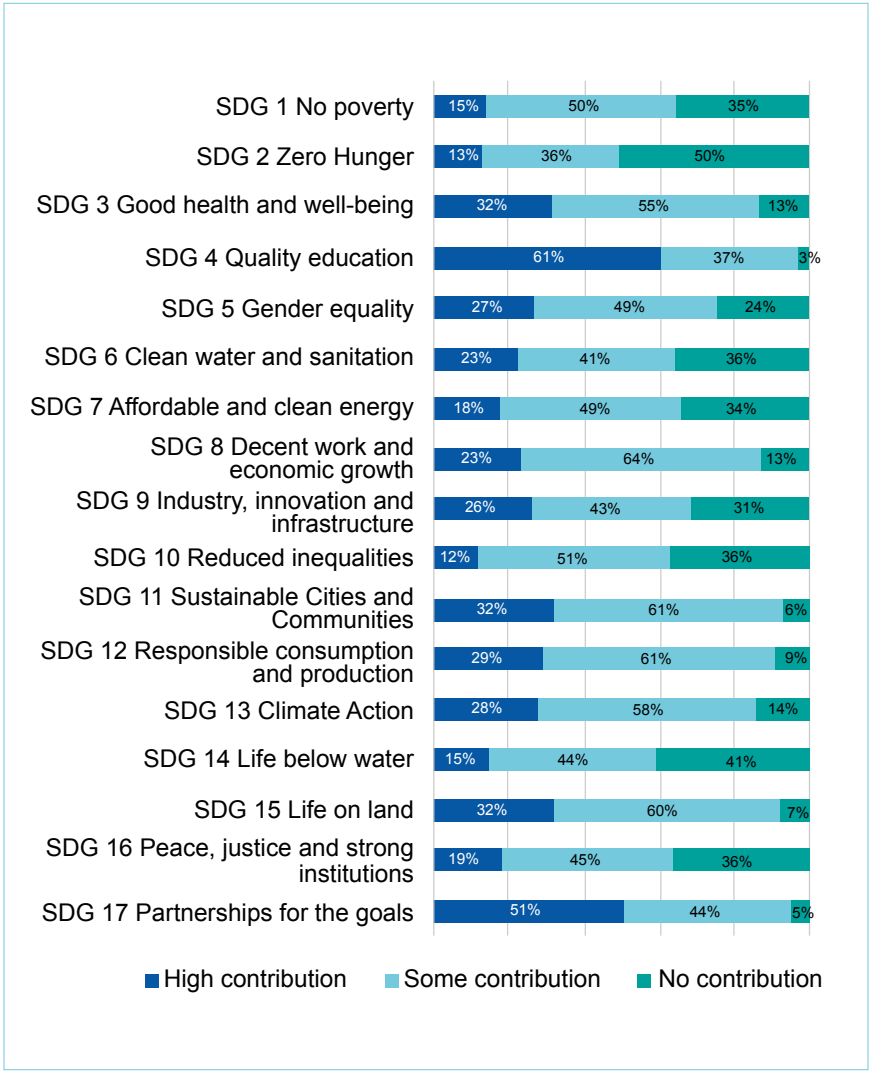
Q26. Outside of the evaluation and re-validation process, has your geopark received any additional support from UNESCO?
Number of responses: 99



Q27. Please rate the impact of having the UNESCO Global Geopark designation on each of the following:

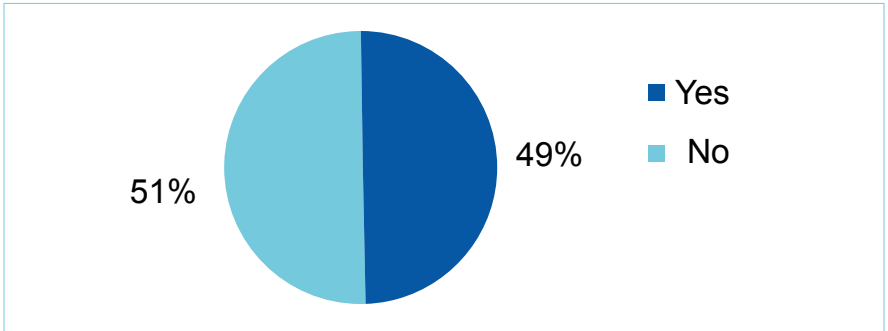


Q28. Please rate the extent to which you believe the UNESCO Global Geopark designation has helped your geopark contribute to the following Sustainable Development Goals?

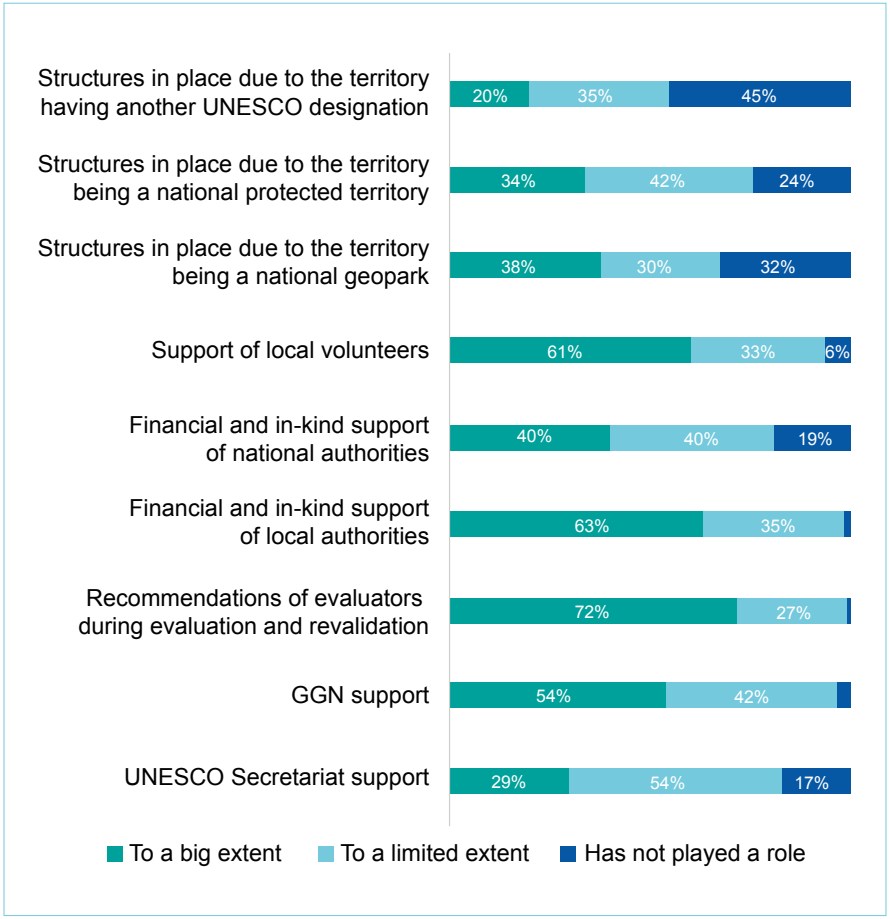


Q30. Has your geopark or local authority conducted any studies on the impact of the geopark?

Number of responses:97



Q31. Please indicate to what extent the following have been important factors for the success of your UNESCO Global Geopark?



Q32. What activities, if any, are you developing in the fields of?

Prevention of Global Climate Change
environmental education projects - fossil free infrastructure
Combate e Prevenção aos incêndios na Chapada do Araripe (desenvolvido junto aos parceiros do primeiro setor)
Local action plan
Monitorization of geosites
Car-free geotours (participants must arrive using public transport)
boost researches, educational activities
Planting trees
workshops and conferences
Geopark Code of Practice for sustainable tourism businesses
definition of a climate plan for the territory
We are active in this field. For example : We have recently run a training course for the Geopark guides on climate chnage so that they can work with the public and schools on this topic; we have initiated modest scientific studies (citizen science) looking at aspects of our territory and climate change; we have organised free talks - for exmaple by a former GIEC member ....
Study and dissemination of the characteristics of soils. Study of plaeoenvironments gto gets clues to better undersand the evolution of climate change.
Occasional involvement and support for local events
A campaingn yearly
Geopark partners raise awareness of these issues in activities and events
Scientific conferences with fieldtrips
We are beginning to develop more focus on this vital topic through science and awareness raising and monitoring.
Including in education and dissemination. Cooperation with industry concerning co2 storage
In talks, discussions and planning
In talks and attending relevant meetings
Local workshops with indigenous communities in one of the municipalities of Geoparque.Incorporation of Climate Change in tourist and local plans. Participation of municipalities of Geopark in Regional Committee on Climate Changes.
Public awareness, exhibitions, guided tours, classes
Conferencies on the territory

Educational activities and cooperation with local ngo's
design of the provincial climate change strategy with community education
Working with Japanese Meteorological Agency on awareness activities including a lecture series, hydropower and solar power used when feasible at geosites
Education for disaster mitigation for all ages
Strengthen publicity and popular science
developing projects for sutainabel mobility in the region
Exhibition about our glaciers about climate change.
Developing of a new visitor centre focusing on glaciers and climate change
Energy safe
Measurement of various parameters, talks
field trips-talks and support of enviromental projects
Creation of zero emissions museum
Educational activities, documents
Reforestation with plant species in danger of extinction
Exhibition geoVR
Studies and exchanges with elected representatives, renewable energy projects, sustainable forestry
Traditional farming
Awareness workshops
Seminars for local residents are held on the theme of the effects of global warming on alpine plants and fisheries.
Launched environmental education for local students (at elementary level)
Peatland restoration (which we were doing anyway)
lectures on predictions on the scale of human impact on climate change and climate changes in Earth history
Info days
Geopark is organizing/supporting public talks and events for local people and schools on Climate crisis
Some workshops, preventing some land use changes by others
not specifically, but we think that UGGp's and their existence plays a role in raising awareness through their common and everyday operations
Waste Bank, tree planting
seminars and meetings with students
School cooperation between different Geopark. Learning from each others territories
Geopark guide is cooperating with Arid Land Research Center of university for contributing to dessert prevention.
reduce plastic , sorting waste , planting tree ,etc.
Forest protection, wetland protection
Peatland restoration / Development of toolkit for mitigating effects of climate change in tourism-value chains
information meetings are held with local groups on the problem of climate change and what we should do as citizens
Songshan BBS
Increased awareness
Projects in Biodiversity and orchard meadows
Cooperation with the climate change team in the county
Research projects at national and international levels, seminars bothj for scientist and for the general public, shool programs
Special exhibitions, international speeches, special lectures given in schools
In addition to public education we contribute to Oxford's climate predition computing project.
Is a special part of our educational programme.
Reforestation actions
awarenes rising campaign
highlighting it in programmes for visitors of the WHS Messel pit
Restored ecology

Geo Education and /or Education for Sustainable Development
not only for schools, but also for residents and tourists
educational programmes for school
Oficinas educativas, projetos permanentes como o Programa GEA-Terra mãe, Palestras e mini-cursos, Circuito de Corridas sustentáveis, incentivo ao desenvolvimento de geoprodutos, etc.
Educative programmes
Azores Geopark Educational Programme; Workshop for tourism enterprises
Geotour-guide training courses for local people
participatin in EGN working group on SDG. Working with local schools giving new material for education

ESD programme with Geoaprk Rangers and cooperaiton partners
Several documentary movies, summer camps, publications, interpretative panels on geotrails, exhibitions, workshops, training of geoguides, leaflets, close cooperation with environmental education centres and schoolsetc.
Evening course for adults, school visits and high profile press releases
definition of the educational program: Géoparcours
We are very active in this field. This is the main area of the work in our territory and we have had huge sucess. For example : We have a contract with the National Education Authority to work directly with the 124 schools in our area; we publish a catalogue of workshops and school visits every year; we participate in diffrent school scinence festivals; we are in partnership with a UNESCO school; we are in partnership with an eco-responsable high school; we have organised an ERASMUS+ 3 year exchange; we have produced a Geopark scohol toolkit .....
Education in schools and progamme for reducing wastes in municipalities
Educational kit for primary and secondary school, mentoring for students different ages, activities for general public.
Walks, talks, school visits and events in our Geopark Centre.
education and training activities in school in the territory, cooperation projects with other geoparks
Science Populariation for students
Campaingns yearly
Geo Education
Geopark partners carry out education on these issues
Local school conferences with fieldtrips
The Geopark is involved with the BBNP's education service and the ambassador training scheme has a significant component involving continuing education.
This is our main activities: education at all levels and after UGGp, connecting our activities with SDGs
It underlies all our education
Running courses and field days
One project about geoeducation in one of the four municipalities of the Geopark. The extensión of project is 8 months. And the participants are students and professors, and local comunity

Courses, seminars
Teaching materials; new educational modules in local curricula; specific program for volunteers; trainings; workshops for different target groups; network of visiting trails; visiting centers; cultural projects; festivals; calendar of events; strategy for local development; geotourism activities; geoproducts development
Exhibitions, guided tours
Many activities towards and with schools, lectures, routes, fieldtrips etc.
annual geo education activities like volunteer camp, geopark into university and community etc.
Visitors centre, development of geoproducts, development of school programmes, reccomendation on behaviour in our area, etc.
introductory workshops to geology and global geoparks, aimed at local guides and actors
«Comprehensive Learning Plan for Children Ages 0 - 18» which includes Geostudies as part of a core curriculum for local schools, teaching special classes about SDGs in local schools
School education programs
Strengthen the activities of science popularization on campus
certificate for Geopark-schools existing; many cooperations with universities; every year we are creating and acting with schoolprograms wich are realgted to Geo and Sustainable Development education
Teaching an elective course in one of our geoschools. Welcoming many school groups and offering them education as well. Education booklets, panels and also various events (lectures, conferences, etc)
Development of a geopark elective course in a local seconday school
Geo Education
Geo&tourism education for local people to increase awerness
Langkawi Geopark Discovery Centre
Geoeducation for pullic
A lot of them: talks, theatre, documentary, comic, books, guide, training course
talks to students in schools and field trips
various educational programmes

Visit tours, management plans with children, educational activities
Meetings with schools for awareness and knowledge of geosites and their conservation
Educational program and app TeachOut
Many activities you can see in yearly report
Annual schools programme, public lectures and events, stakeholders training
Geoeducation in local schools, from elementary to university
Conferences in educational centres
The curriculum has been developed over the compulsory education period in Japan (9 years), and children are learning about the hometown including Geo
Geo education
SDGs related program has been started in this year. Comparative studies on Geopark has been done by local high school.
in the field and regional
Programmes of education and lifelong learning in schools and communities
We are partners in setting up a national charity called the Scottish geology trust which will address this at a national level
year-long constant interpretation at some geosites and visitor centres of the Geopark and special events, like the EGN week on this topic
educational events, themed tours
1) Geopark Research course in one of the local highschools which is obligatory for 1st-2nd years and optional for 3rd years. 2) Lecturer dispatch programme, through which we send geopark guides to schools for free. 3) Community education programmes 4) Geopark English Camps - a project aiming at making students interested in both geopark and English language and enable them to talk about Oki on a global stage
info days together with the climate info days
It is one of our core business. We pay special attention on these topics
Geopark's partner Anogia Environmental Education center, with the support of geopark has eveloped and is supporting a National School network focusing on geoconservation and geoparks
several workshops and training courses
development of educational material for the younger generation. Cooperation with local educational parties in terms of building educational database. The geopark has high ambition to increase its educational role/value on local, national and international scale

geopark goes to school, school goes to geopark
seminars and meetings with students, multimedia products, gamification
Geopark schools and international GeoCamp schools
Community-based learning for children and students to make proud of own local area / Raise awareness of SDGs
International Conference on Biodiversity 2019 (IBD 2019)
International education on global climate change together other geoparks (Erasmus + programme)
Popular science program for students
Development of an organisation-wide education programme (including earth science) / Geopark partnership scheme
Sitia Geopark in collaboration with the local schools conducts educations programs each year
The national science popularization day is held every year
Increased awareness
Sustainable tourism on Geosites
Establishing Geopark schools, Training for landscape guides, lectures
Cooperation with all environmetal institutions in the park
Annual calendar of activities including training for Geoheritage guides, training for the different partners of the Geopark, primary and secondary school programs, seminars, talks, guided visits, workshops
Special exhibitions, international speeches, special lectures given in schools
School programme and course for teachers
We're continually developing educational materials and hosting educational activities aimed at all age groups
We have (state-)designated Geopark locations for BNE (= education for sustainable development)
«Geokids» and from 2019 a education program for local scools
Geopark schools and kindergardens
New approaches in the WH Messel Pit on programmes and tools for adult and children
To carry out popular science education for students and residents

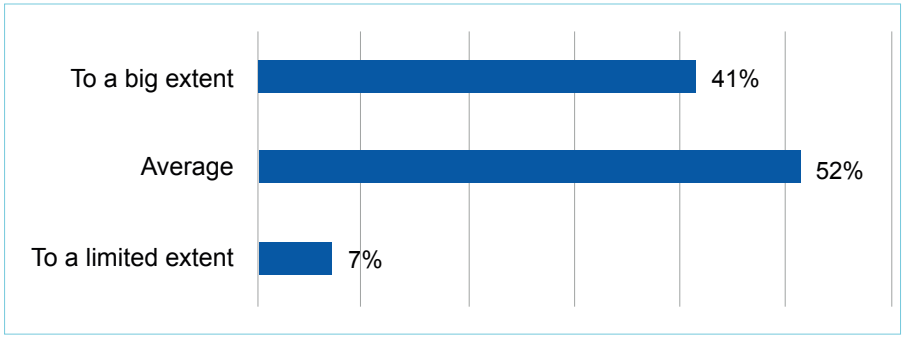
Disaster risk reduction
maintenance of the footpaths etc
exhibitions, meetings and pubblications
Elaboração de projetos específicos para áreas de risco (Exemplo: Geossítio Ponte de Pedra/ Estabilização da Encosta do Seminário em Crato - CE)
Awareness activities and events
Oral presentations about Earth quakes
workshops and conferences
nothing planned in this area
management of srambled spaces to fight fires
We are active in this area. For example : We have a model/game used with secondary school students about risks in our territory; we have workshops on tusnamis in Lake Geneva; we are investigating historical sesmic events in our area and contacting seismologists about recents events in our area
Dissemination of geological hazards (monitoring of landslides, faults and active volcanoes): population, schools
IDDR activities
Celebrate the IDDR with an activity for general public
A campaingn yearly
as a geologically stable area, interventions are limited to linking local geo-hazards to such risks around the world especially in other UGGps
The Geopark serves as a vehicle for science and awareness raising
Information meetings (climate change and others), part of our educational programs. Few hazards really thretening our area so far, but include risks and risk reductuions anyway
Do reports for the local authority and remedies necessary
Advising and writing reports for the government
Risk Studies to develop volcanic and other risk plans
exhibitions; classes; public events
Educational activities with children
ngo's and authorities allready do this
articulation with the risk prevention service
Volcano readiness classes in local schools, participating in the Niigata Yakeyama Volcano Disaster Risk Reduction Council, working with Japanese Meteorological Agency on a lecture series about typhoons and flood disasters
Awareness of possible future disasters
Strengthen publicity, geological disaster drill, etc.
preparing a matserplan with all municipalities
Various events, commemorating events such as historical eruptions by planning conferences and other special events, inviting specialsts to speak on special planned events about geohazards in our area
Conferences/meetings on the IDDR day (13 October)
Disaster risk reduction
education for schools in the region to rise knowlages of students about disaster
Tsunami Warning System
Awareness to natural hazard
Talks to population and Civil Protection
visibility of the Day with a field trip
Earthquake hazard prevention through the earthquake simulator
Exhibitions, lectures
Convention with regional geological order and participation with schools for the day of disaster reduction. Authorizations of works in the Park by mitigating the hydrogeological risks
Secured four visit mines and educational program for flooding
Public lectures
Give information
We are holding a seminar on the theme of tsunami. In addition, although it was a town business, it maintained a passage to evacuate from the tsunami and created a disaster reduction handbook

Walking-class for disaster risk reduction at local elementary school. Students walk on streets around the school and learn landscape to evacuate when earthquake occurs around the area
in the field and regional
Natural flod management (which we were doing anyway)
Some events with demonstrations like in the case of the Volcano Day on June 1
Excursions
Geopark's representative is vice catalist of GGN Geohazards action group coordinating celebration of IDRR in UGGps, and was former catalyst of EGN Geohazards group. Its partner Natural History Museum has a great experience and many activities in DRR
Some workshops
Planning on leading together key partners for risk reduction and build a risk management plan
geopark goes to school, Green Camping, Talk show, disaster preparedness exhibition
seminars and meetings with students
Disaster reduction in Finland belongs to national authorities.
Sharing memories and experiences, protect disaster occurred before
Vegetation recovery
Cooperation with competent services and voluntary groups
There is a special public awareness of the impact of geological disasters
Increased awareness
Attendance with the topic «Landslide». Specila guided tour
Planning to develop a strategy on soil erosion
Seminars, guided visits, training courses for mountain guides and for the general public
Special exhibitions, international speeches, special lectures given in schools
Designation of local disaster risk reduction leaders as 'Volcano Meisters', and prevention and using destroyed roads and buildings as 'Desaster Remains'
Our Geopark has very solid ties with our local Search and Rescue group who play a role in planning for and responding to disasters

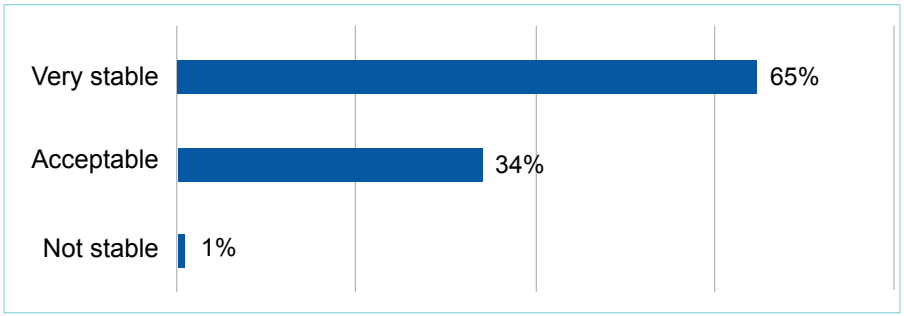
We have a co-operation with local groups regarding risk reduction of floodings and landslides
Fire Forest Risk Educational activities and Reforestation actions
change in soil cultivation (activity is in early stage)
integration in new programmes and tools for activities
Geological disaster prevention education

Sustainability

Q33. To what extent is the functioning of your geopark secured for the foreseeable future from a financial point of view?
Number of responses: 99

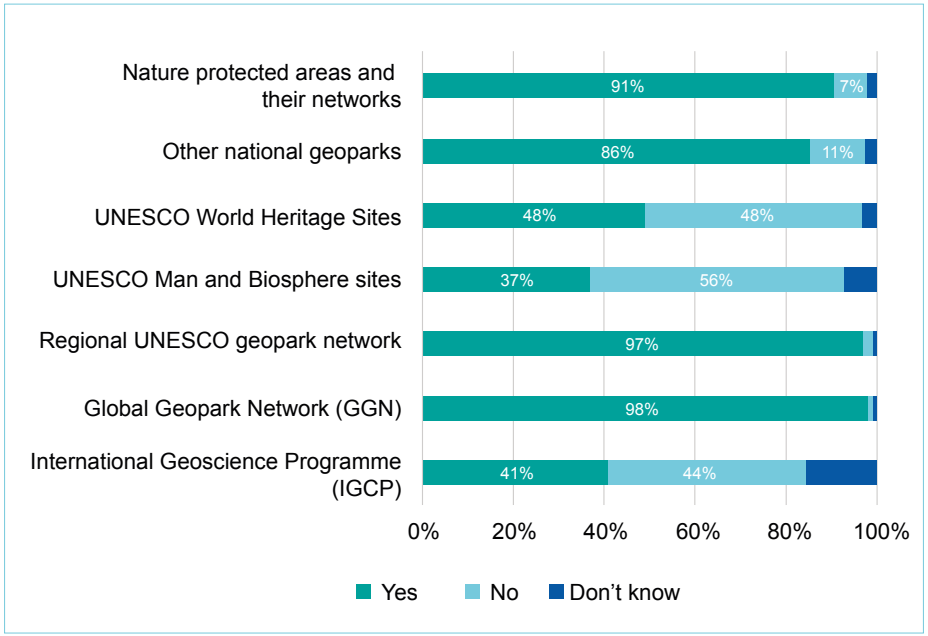


Q34. How stable is the institutional arrangement of your geopark?
Number of responses: 99



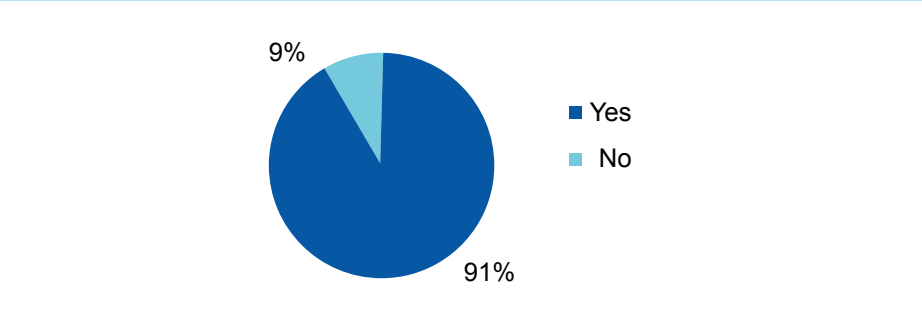
Partnerships and cooperation

Q36. Please indicate whether your UNESCO Global Geopark actively cooperates with the following:



General recommendations for improvement for the programme

Q41. Would it be appropriate if we contact you after the survey for a further discussion about the impacts of the Programme?
Number of responses: 93



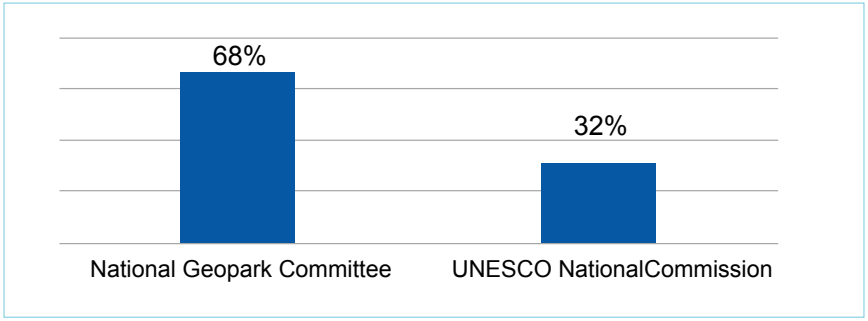
A.2 Results of the UNESCO Global Geoparks Survey for UNESCO National Commissions and National Geopark Committees

- Survey release date: October 30, 2019
- Survey closing date: November 27, 2019
- Total number of replies: 19

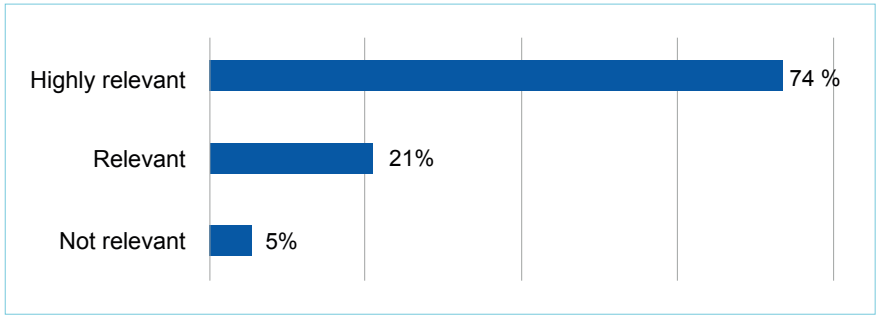
Q1. Which country are you based in?

1. Netherlands ☐
2. Rep. of Korea ☐
3. Spain ☐
4. United Kingdom ☐
5. Slovenia ☐
6. Czech Republic ☐
7. P.R.China ☐
8. Norway ☐
9. Croatia ☐
10. Italy ☐
11. Russia ☐
12. Finland ☐
13. Japan ☐
14. Canada ☐
15. France ☐
16. Germany ☐

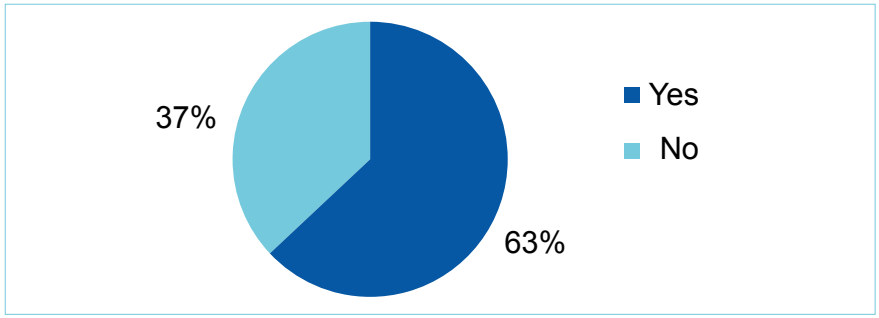
Q2. Please confirm whether you respond on behalf of a UNESCO National Commission or a National Geopark Committee:



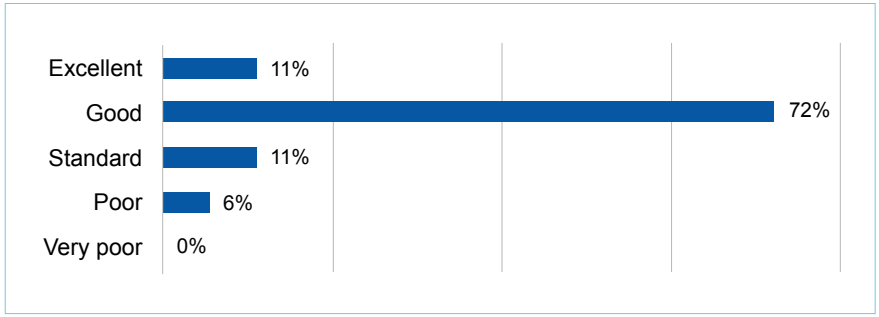
Q3. How relevant is the UNESCO Global Geopark designation with regards to your country needs and priorities?



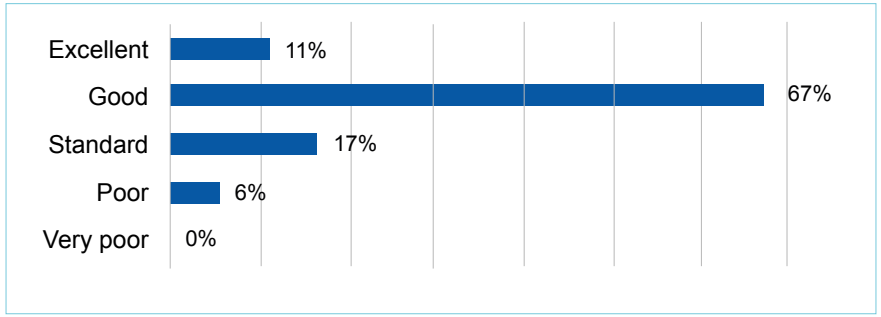
Q5. Outside of the designation and re-validation process, have geoparks in your country received any additional support from UNESCO?



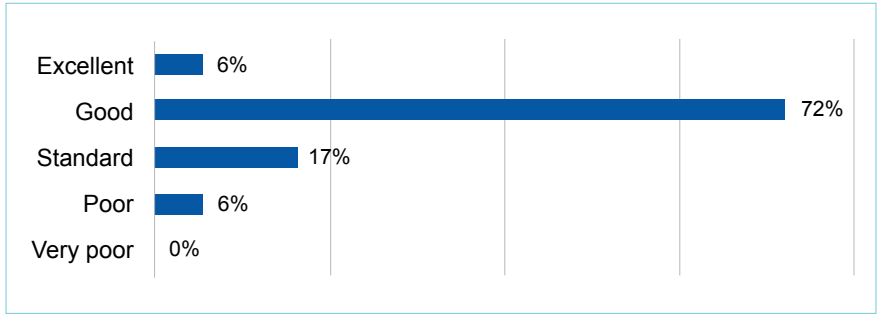
Q6. How would you rate the transparency of the UNESCO Global Geopark designation process (including evaluation mission)?



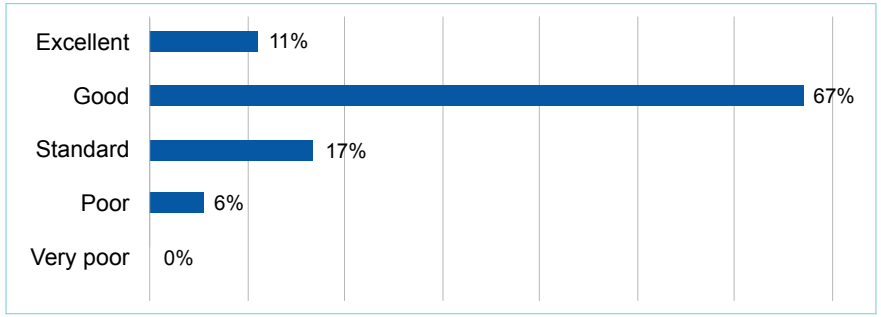
Q7. How would you rate the transparency of the re-validation process?



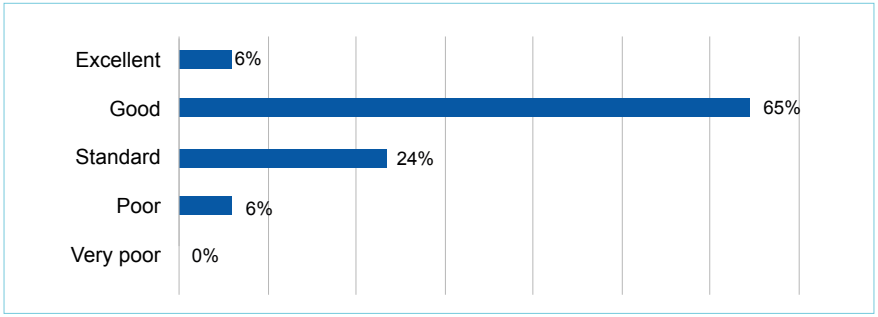
Q8. How would you rate the technical and scientific soundness of the UNESCO Global Geopark designation process (including evaluation mission)?



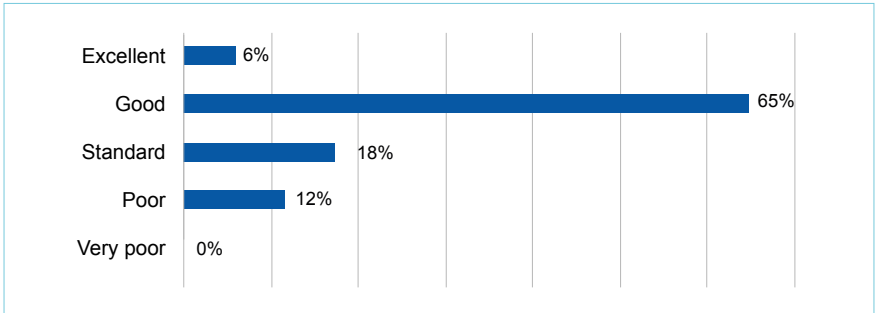
Q9. How would you rate the technical and scientific soundness of the re-validation process?



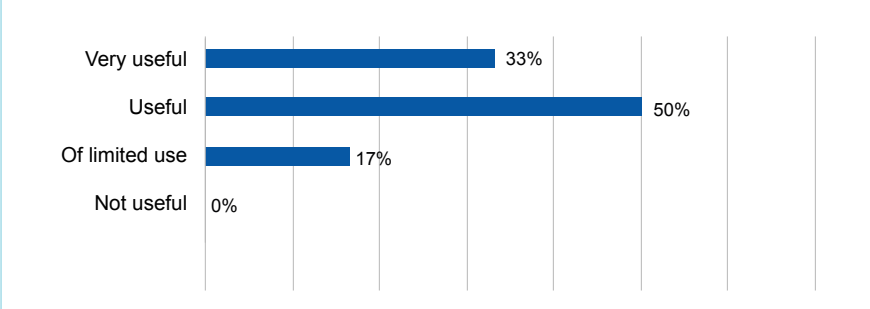
Q10. How would you rate the efficiency (i.e. timeliness, simplicity) of the UNESCO Global Geopark designation process (including evaluation)?



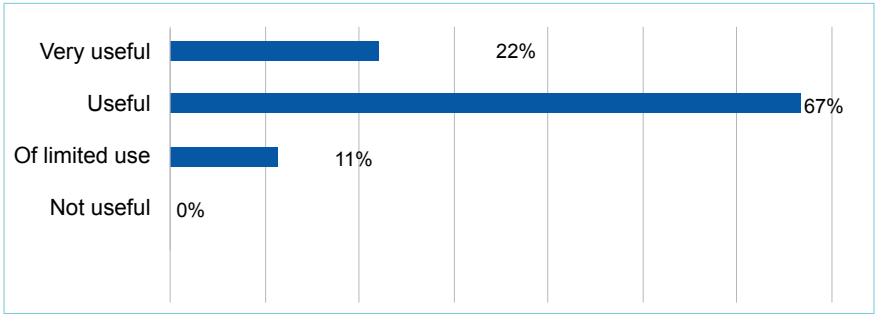
Q11. How would you rate the efficiency (i.e. timeliness, simplicity) of UNESCO Global Geopark revalidation process?



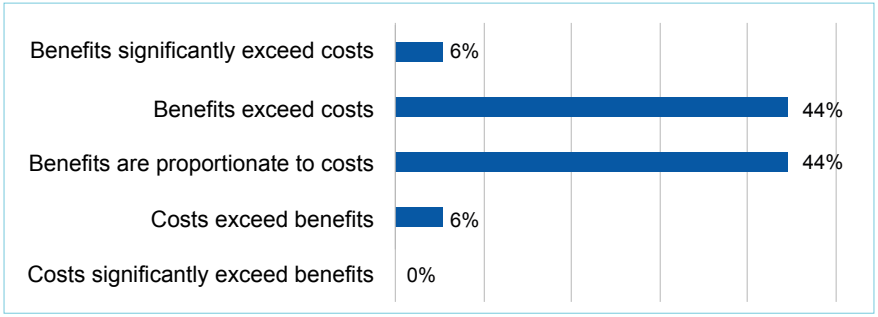
Q12. How useful is the support provided by the Global Geoparks Network (GGN) to geoparks in your country?



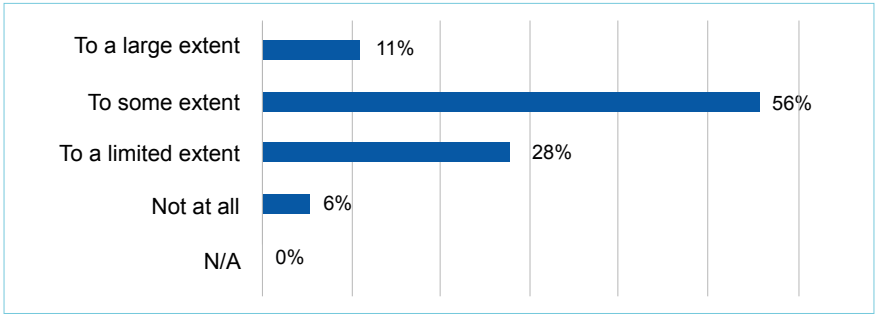
Q13. How useful is the support provided by the UGGp Secretariat to geoparks in your country?



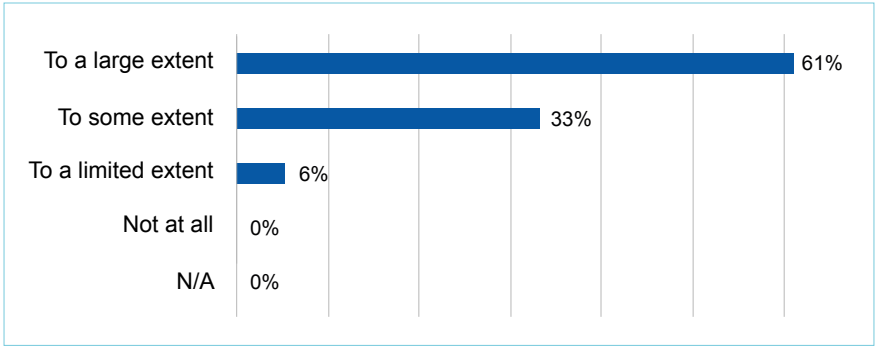
Q14. How would you rate the overall cost-benefit relationship between all costs related to UNESCO Global Geopark designation and all benefits?



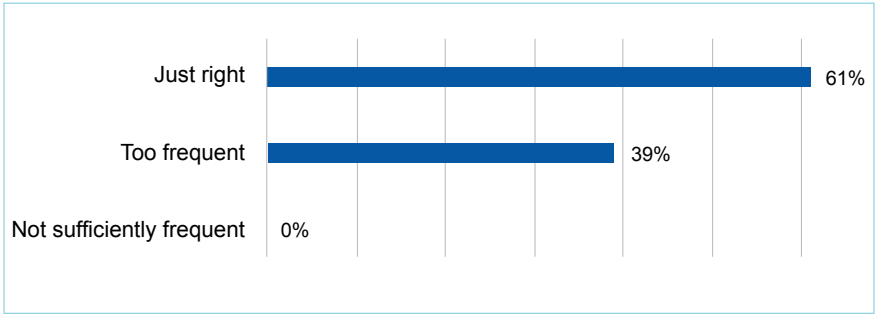
Q15. To what extent has the designation led geoparks in your country to be more mindful of issues related to inclusion of disadvantaged groups i.e. indigenous people, people with disabilities, etc)?



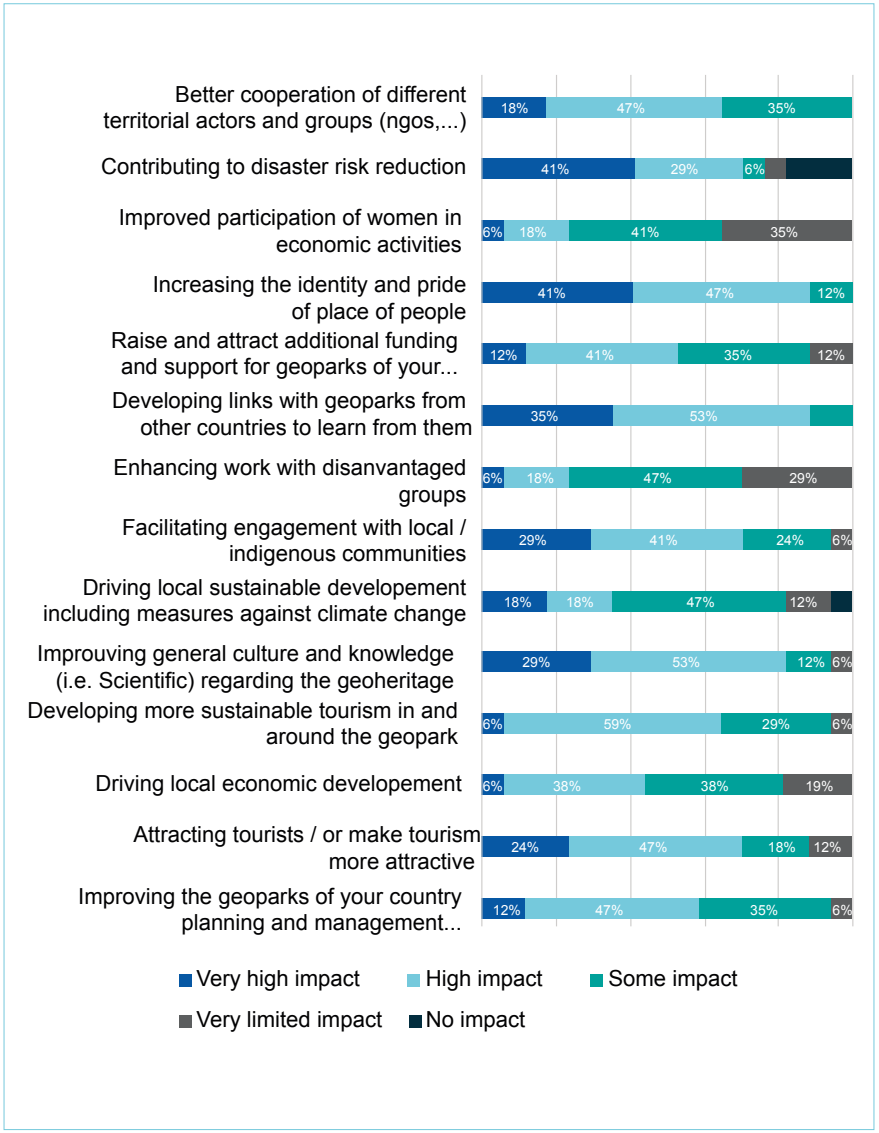
Q16. To what extent have geoparks in your country improved their quality/performance thanks to the recommendations issued after evaluation and/or revalidations



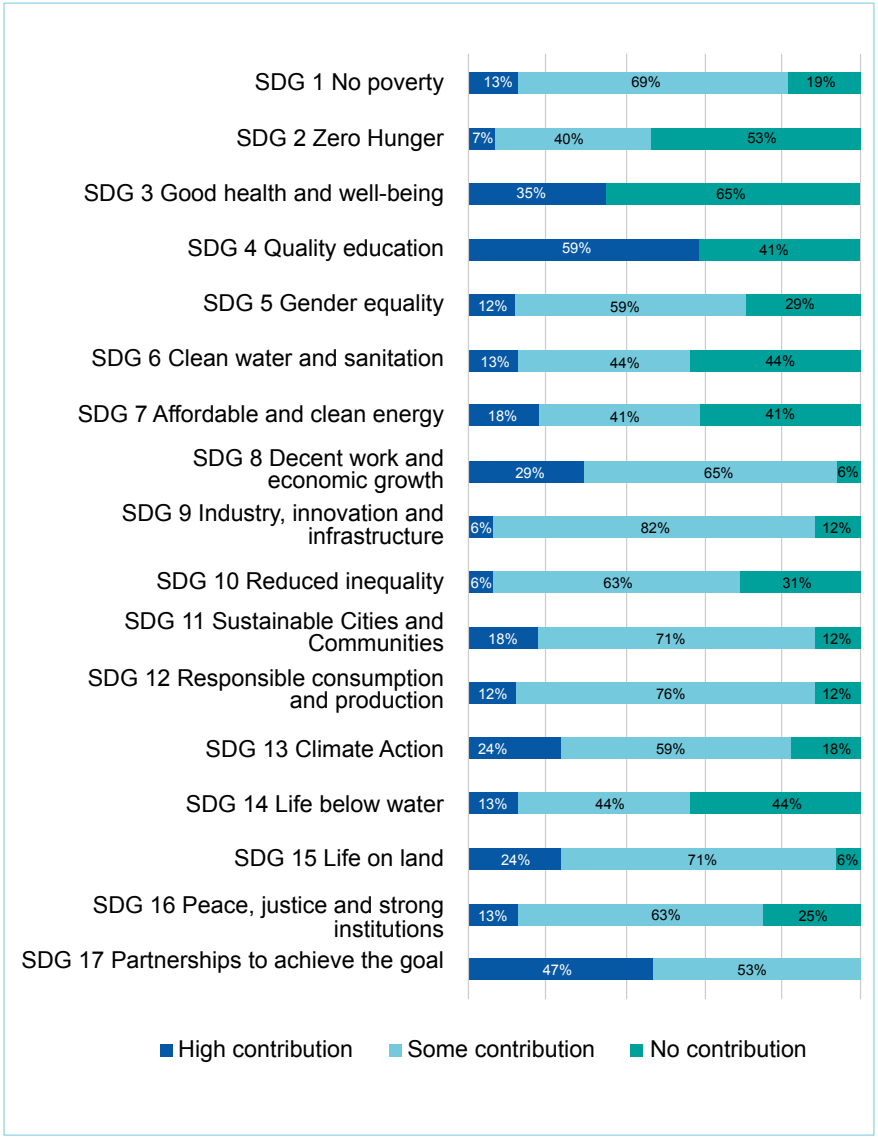
Q17. How would you rate the frequency of the re-validation procedure?



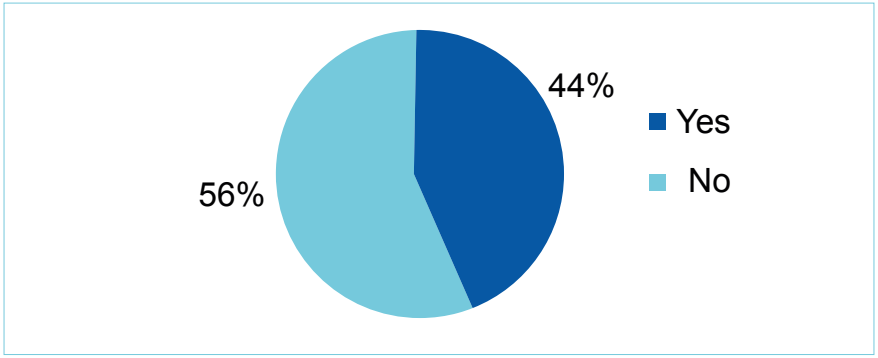
Q18. Please rate the impact of having the UNESCO Global Geopark designation on each of the following:



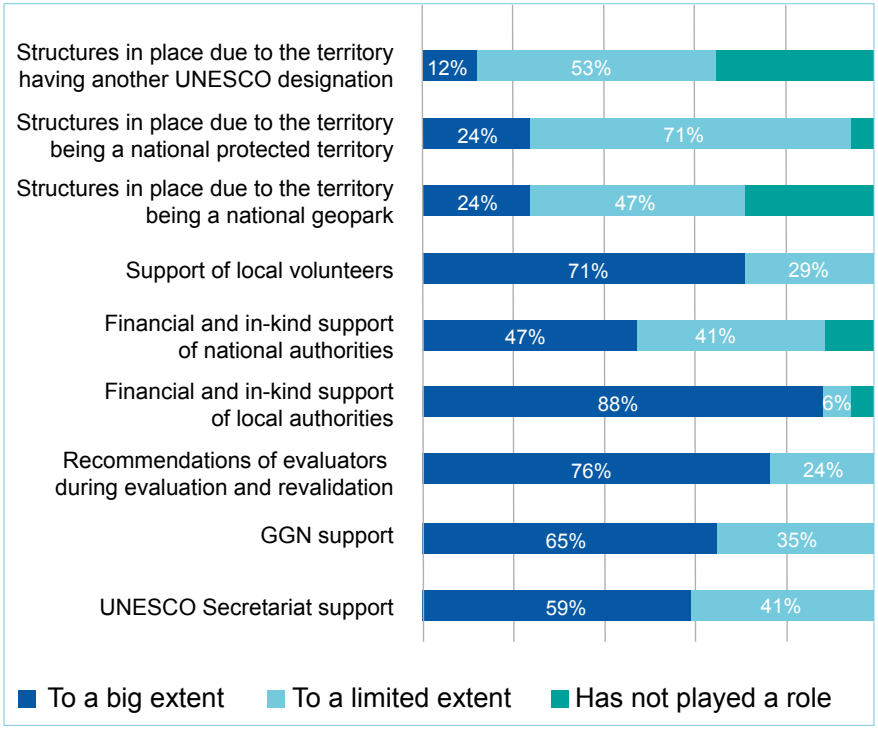
Q19. Please rate the extent to which you believe the UNESCO Global Geopark designation has helped the geoparks in your country to contribute to the following Sustainable Development Goals?



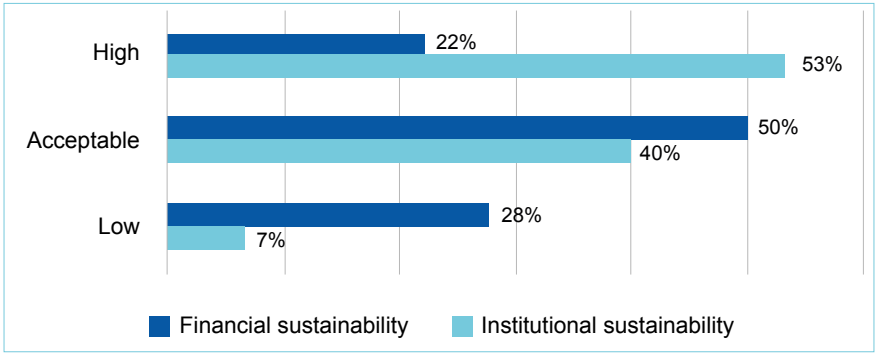
Q20. Have UNESCO Global Geoparks, local or national authorities in your country, conducted any studies on the impact of the UNESCO global geoparks?



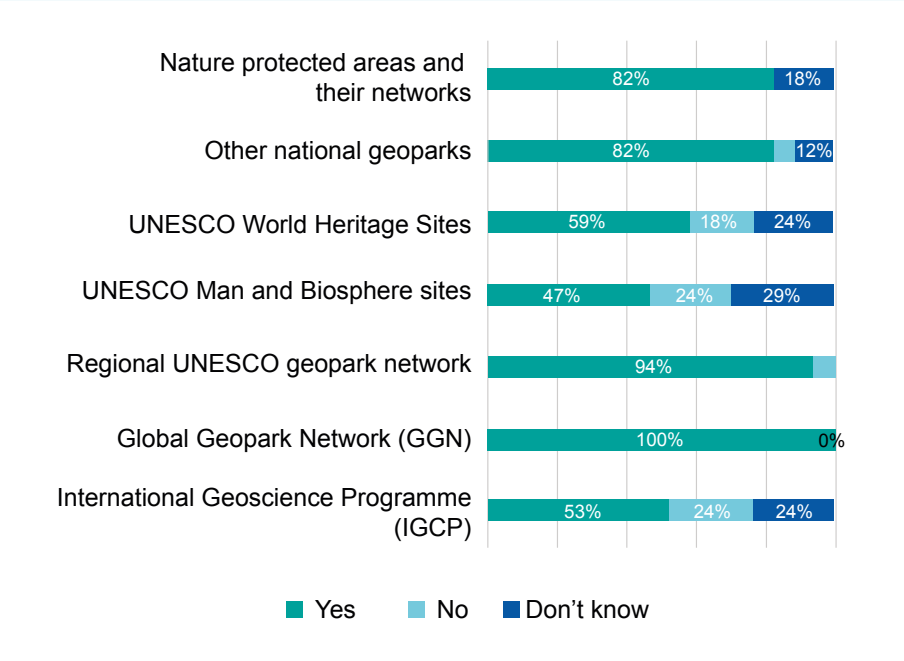
Q21. Please indicate to what extent the following have been important factors for the success of the UNESCO Global Geoparks in your country?



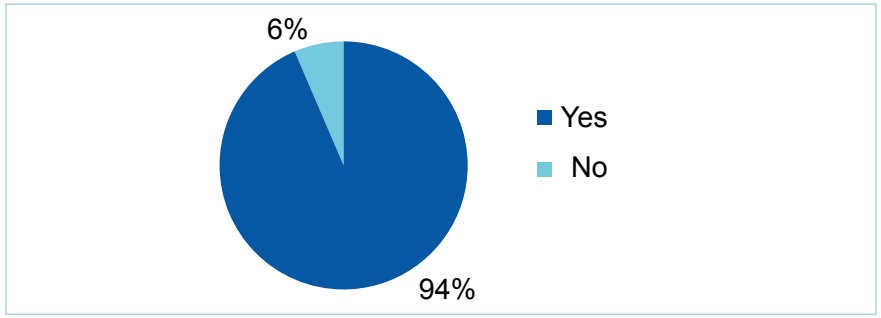
Q22. How would you rate the sustainability of UNESCO global geoparks in your country?



Q24. Please indicate whether UNESCO Global Geoparks in your country actively cooperate with the following:



Q30. Would it be appropriate if we contact you after the survey for a further discussion about the impacts of the Programme?



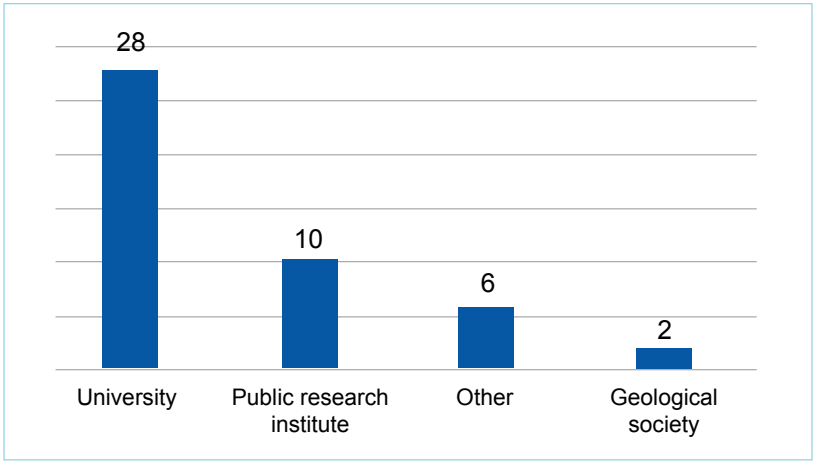
A.3 Results of the survey for IGCP project leaders

- Survey release date: October 31, 2019
- Survey closing date: November 27, 2019
- Total number of replies: 46

Q1. Please confirm your role as a IGCP Project Leader

Yes	No
39	7

Q2. Please select the type of organisation you were based in when you participated in an IGCP project



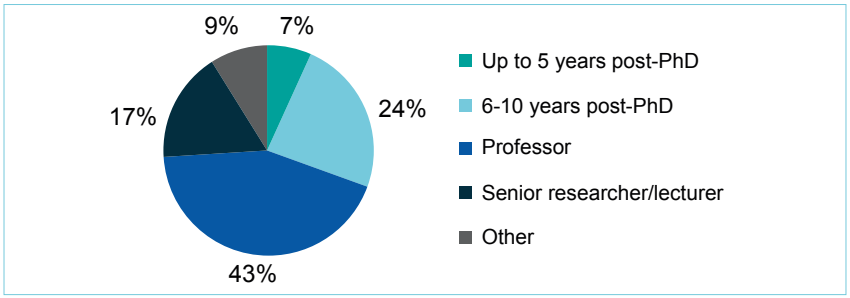
Q3. Please indicate your nationality at the time you participated in an IGCP project (if you have more than one nationality, please indicate the one you consider your main nationality):

Country	Number
Algeria	1
Argentina	1
Australia	2
Austria	1
Brazil	3
Cameroon	1
Canada	2
Chilean	1
China	9
Cyprus	1
Czech	1
Dutch	1
French	2
Italy	1
Ivorian	1
Japan	2
Lebanese	1
New Zealand	1
Sierra Leon	1
Spain	5
Thai	1
Unites States	4
Venezuelan	1
Zambian	1
NR	1

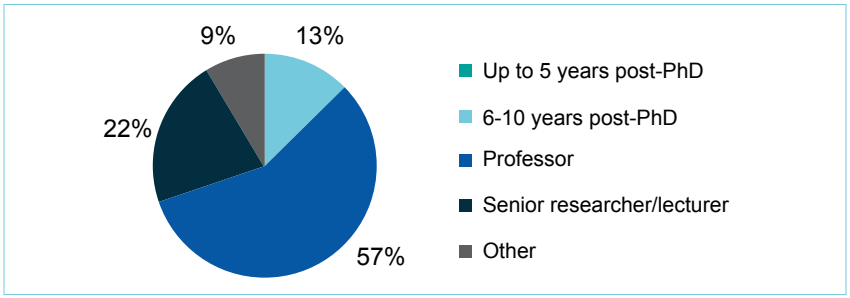
Q4. Please indicate the date when the IGCP project ended (or will end)

Year	Frequency
1997	1
2008	1
2016	2
2017	3
2018	3
2019	8
2020	6
2021	5
2022	2
2023	7
2024	3
NR	5

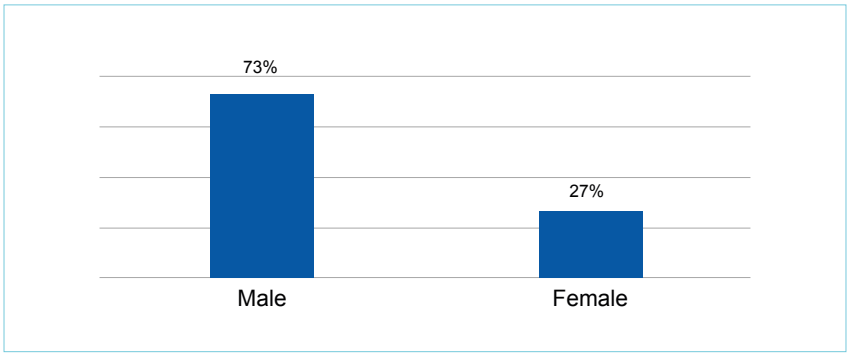
Q5. Please indicate your career stage when the IGCP project started (please select the category that aligns best with your career stage at the time):



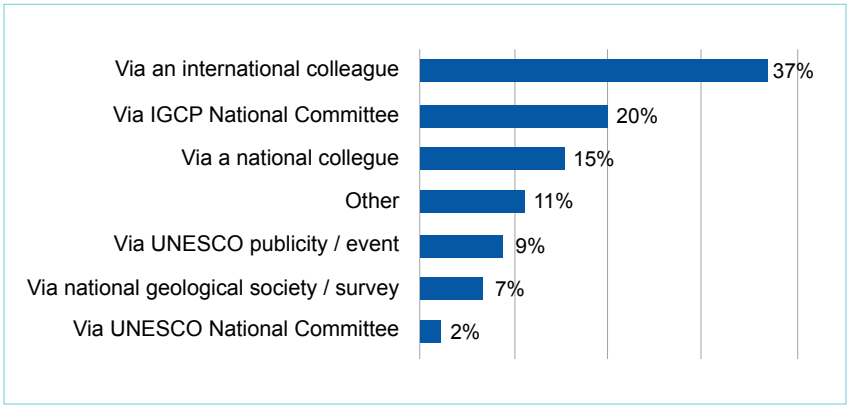
Q6. Please indicate your current career stage (please select the category that aligns best with your current career stage):



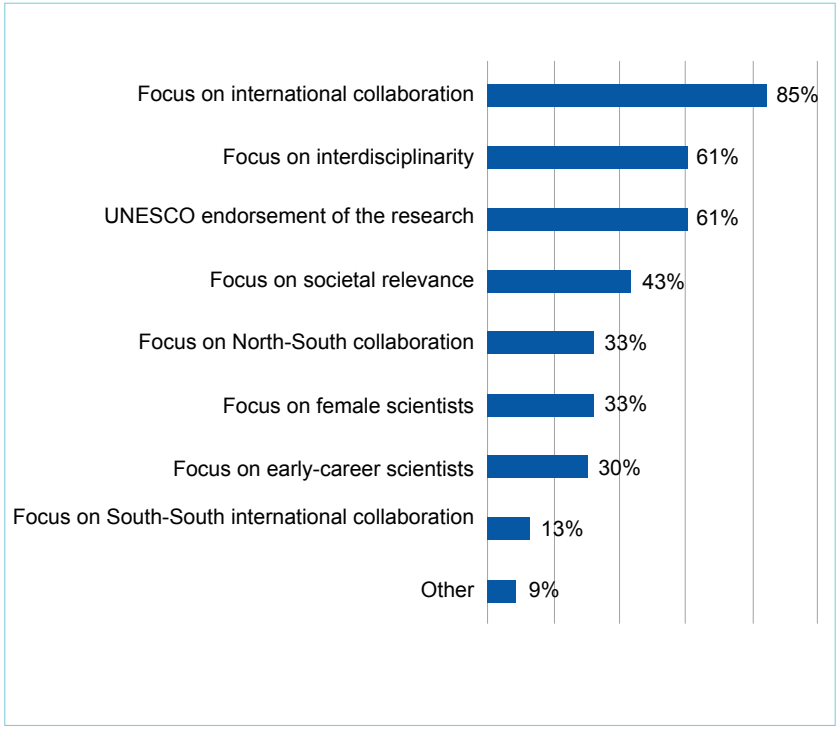
Q7. Please indicate your gender



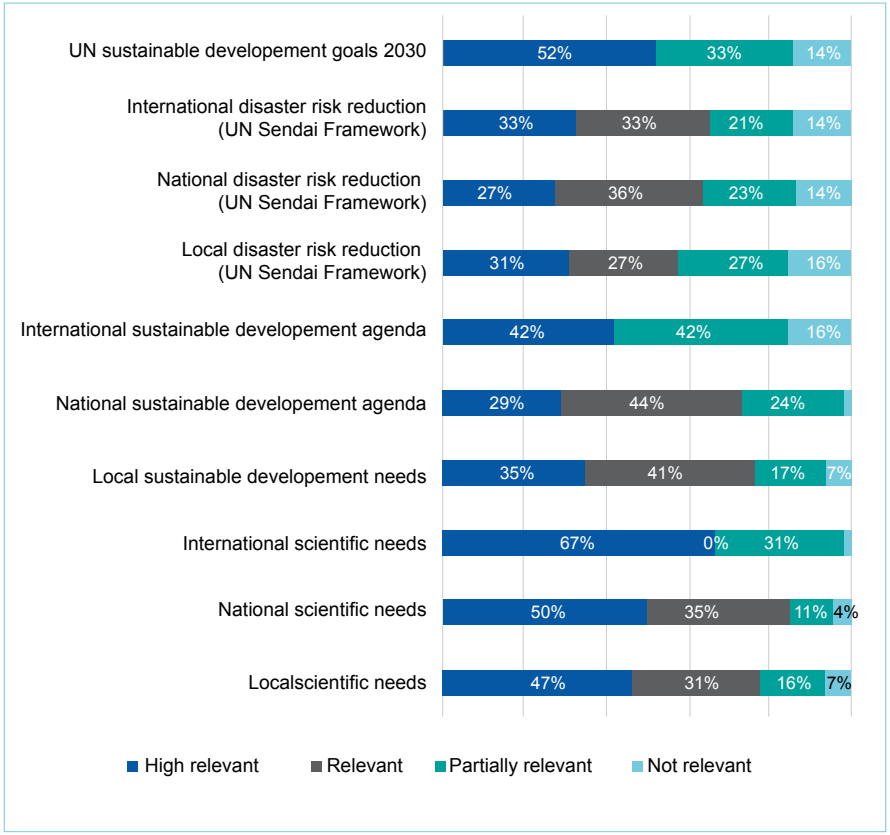
Q8. How did you first become aware of the IGCP?



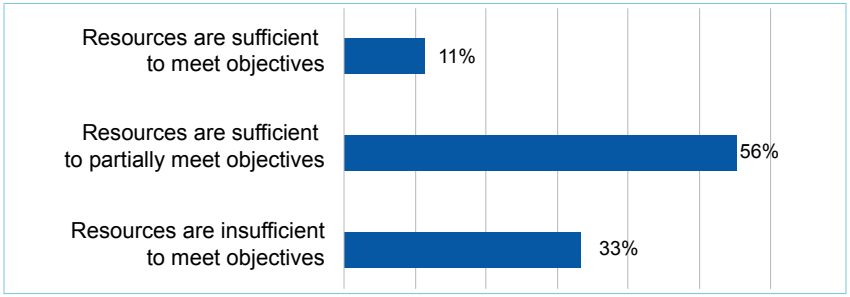
Q9. What features of IGCP were particularly attractive to you? Please tick all that apply



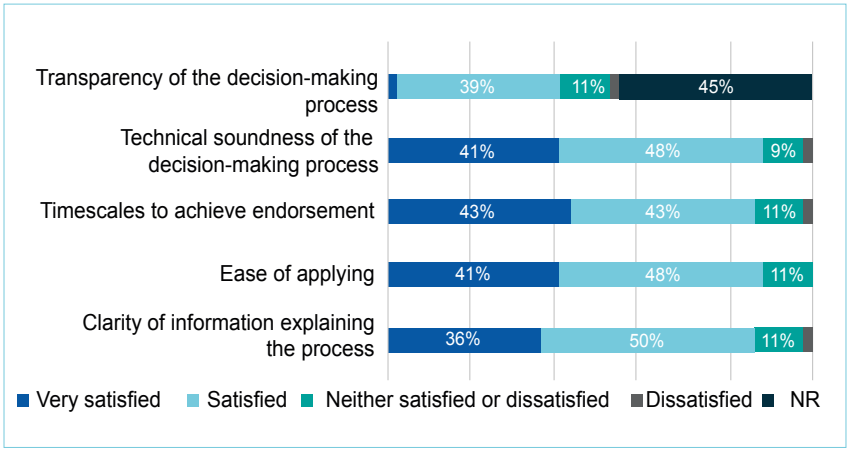
Q10. Is the design of the IGCP programme relevant to meeting:



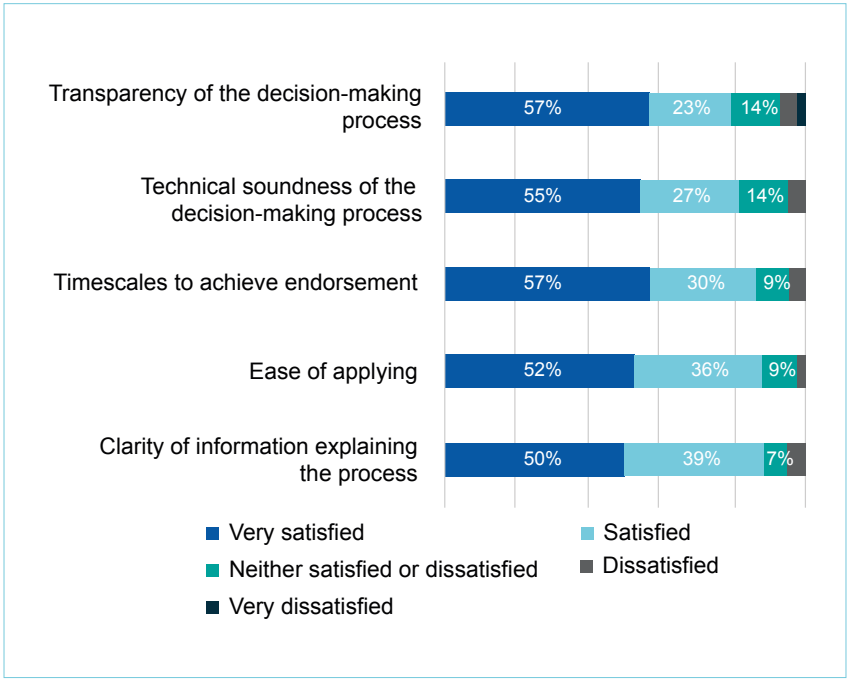
Q11. To what extent are the resources allocated to your project from IGCP appropriate to achieve its objectives?



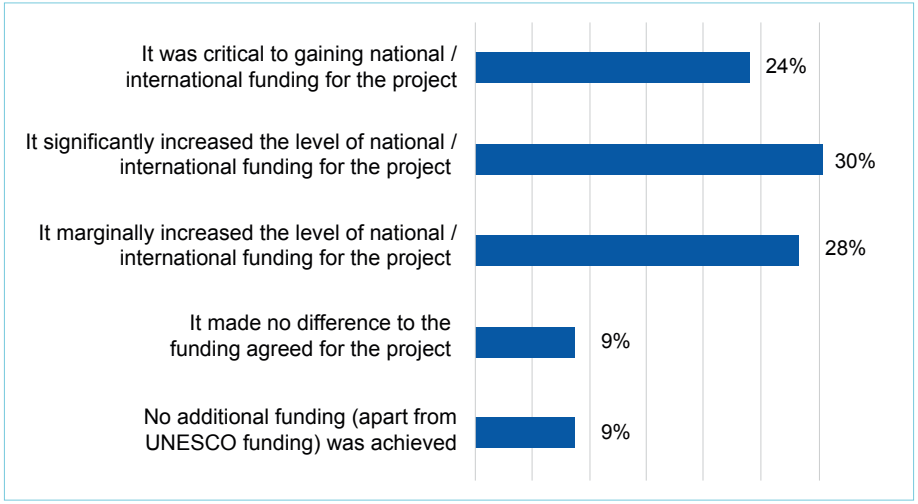
Q12. How satisfied were you with the following features of the process of applying to your IGCP National Committee to achieve endorsement of your proposal to IGCP



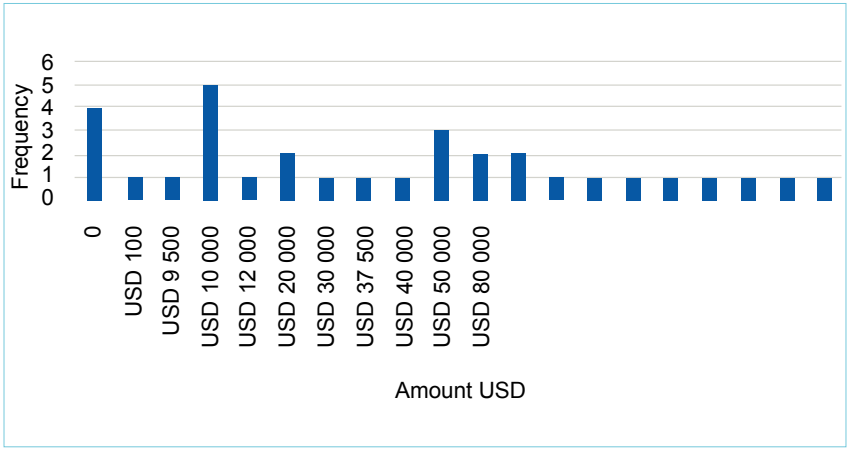
Q13. How satisfied were you with the following features of the UNESCO application process for IGCP?



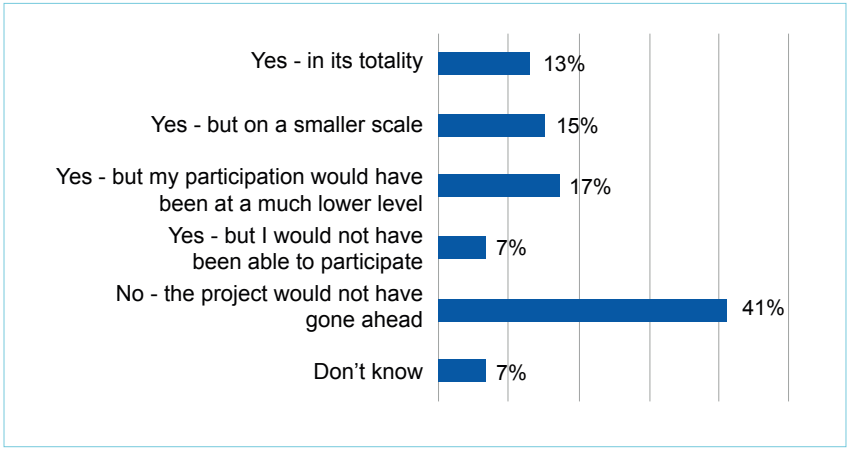
Q14. In your view, did achieving IGCP funding affect the total level of research funding to the project?



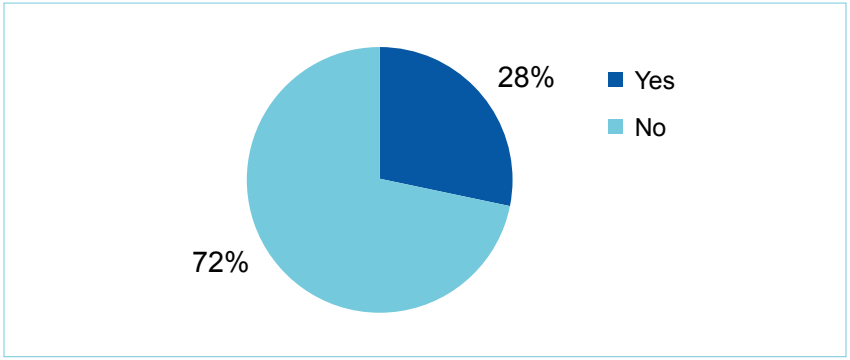
Q15. What was the (approximate) value of total funding for the project (excluding the IGCP funding) in US$



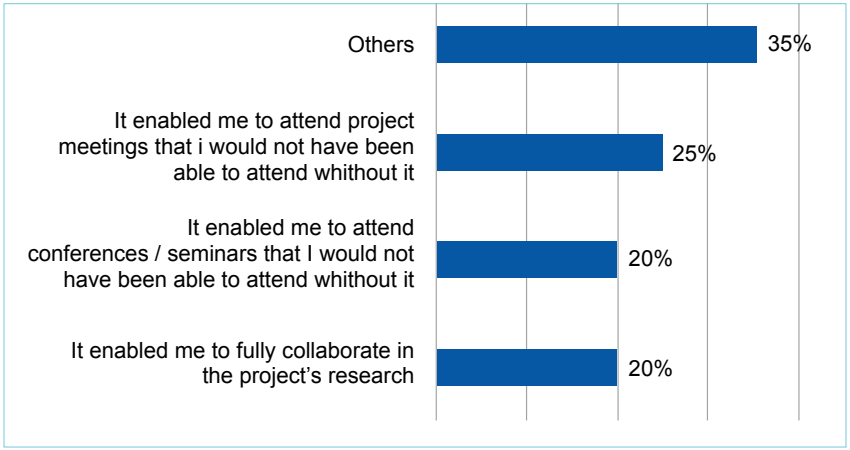
Q16. In your view, would the project have gone ahead without IGCP funding?



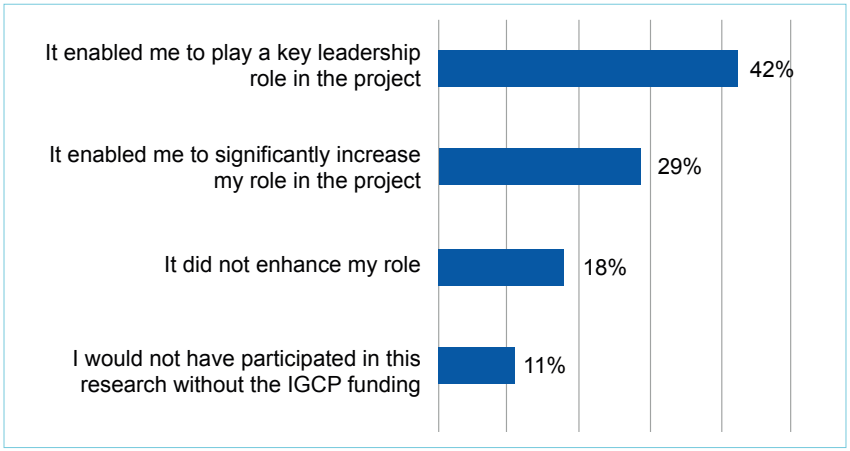
Q17. Did you personally receive IGCP funding?



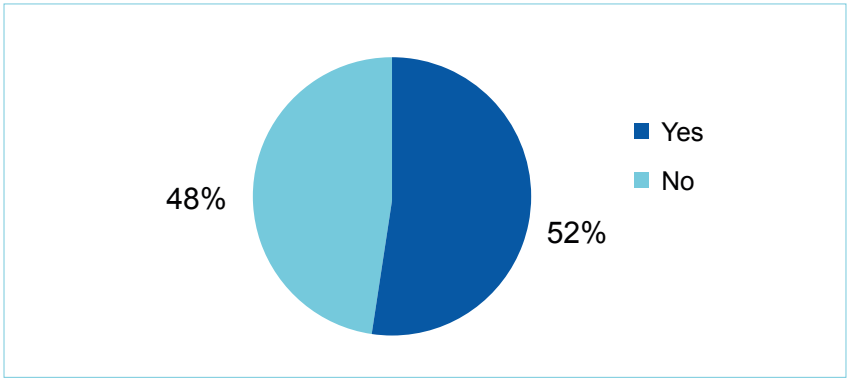
Q18. What did the IGCP funding enable you to do?



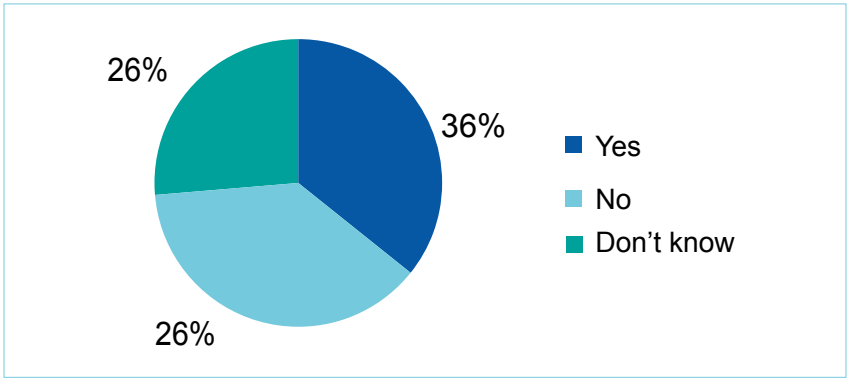
Q19. How did IGCP funding enhance your role in the project?



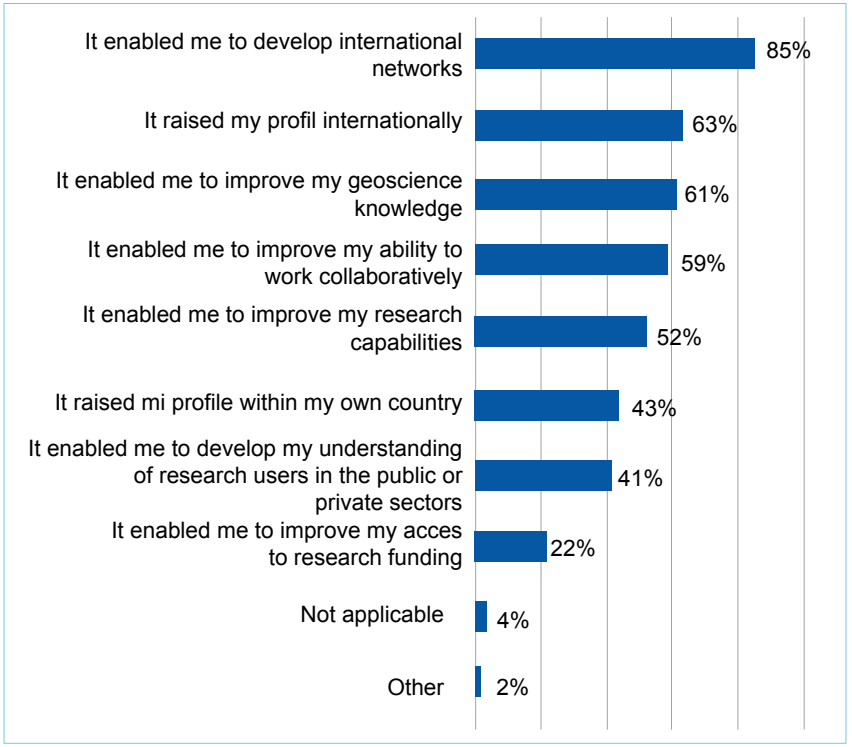
Q20. During your IGCP project, did you participate in any activities with other IGCP projects (other than your own IGCP project)?



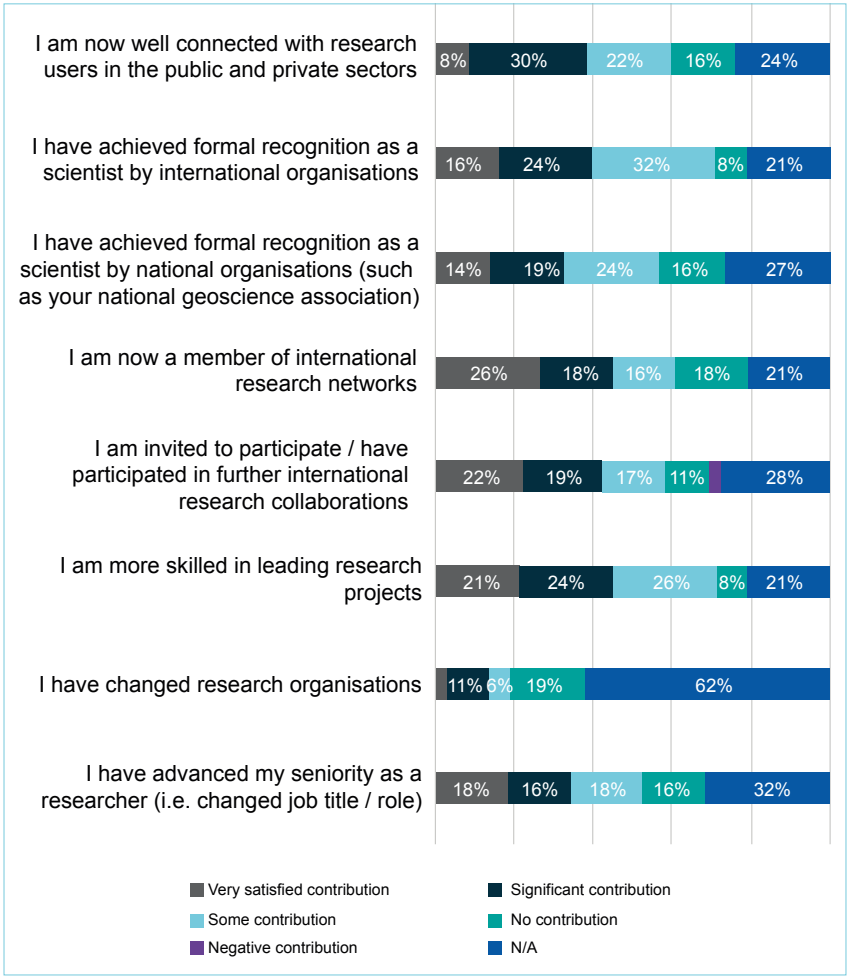
Q22. Were there any linkages between your IGCP project and any UNESCO Global Geoparks?



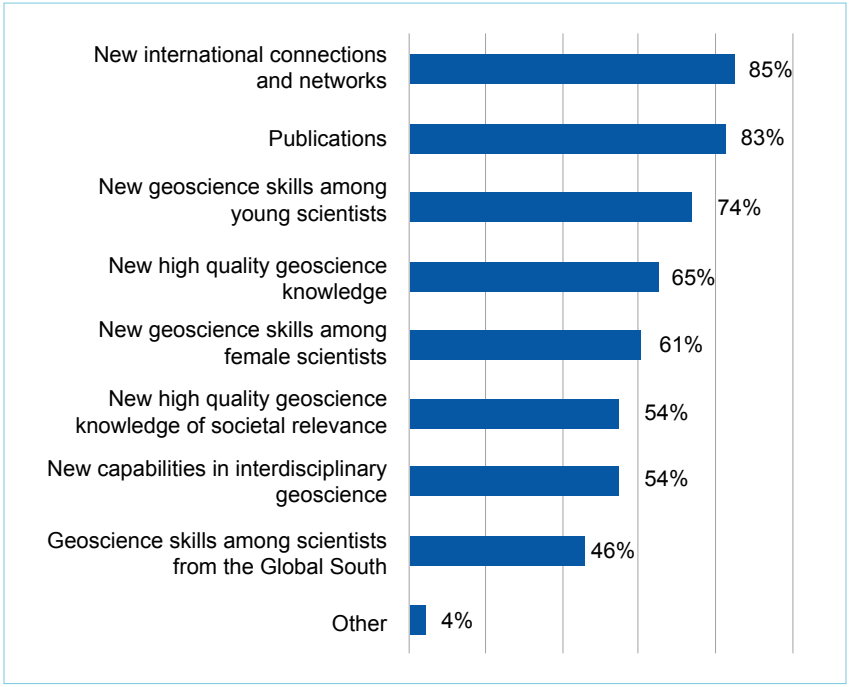
Q24. Did participation in the IGCP project enable you to develop your research skills and experience in one or more of the following?



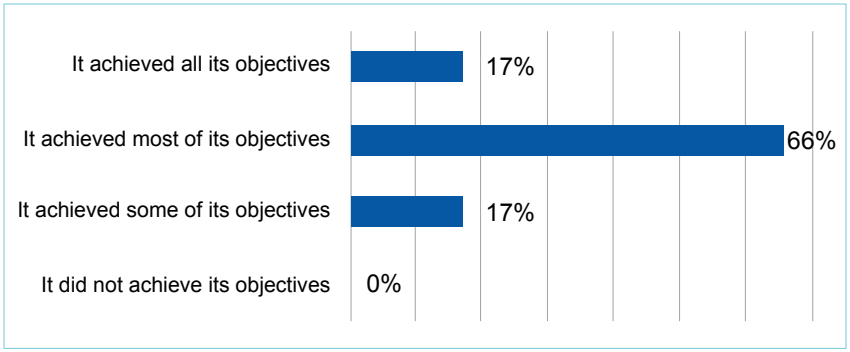
Q25. Since the project ended, has your career as a geoscientist advanced? If so, what contribution did participating in the IGCP project make?



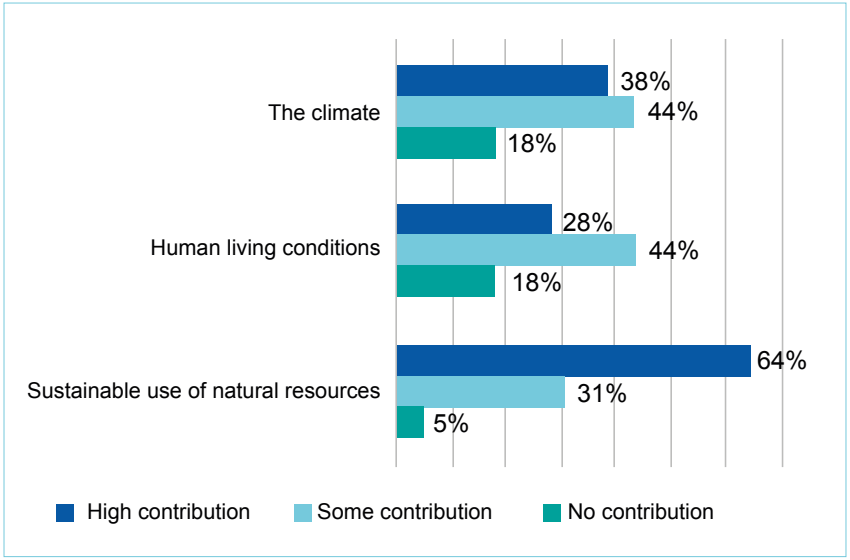
Q26. What are the key outputs (or expected outputs) of the IGCP project?



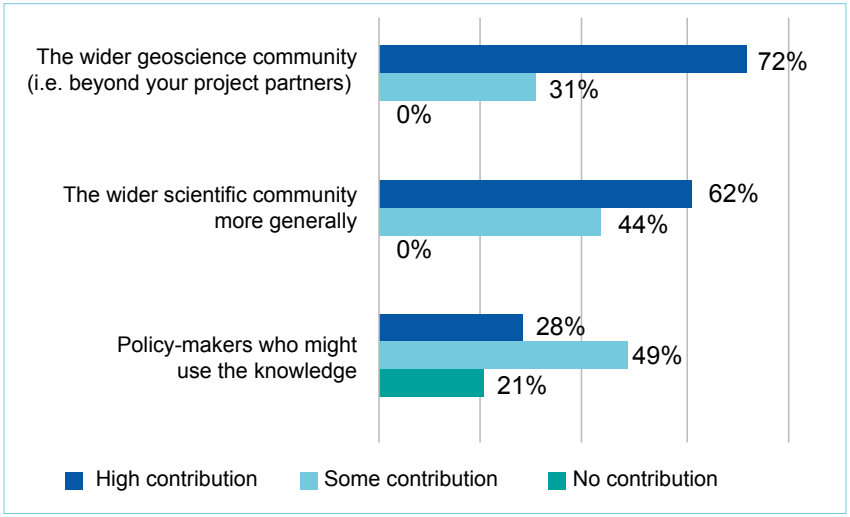
Q27. If your IGCP project has finished, did it achieve the expected outputs?



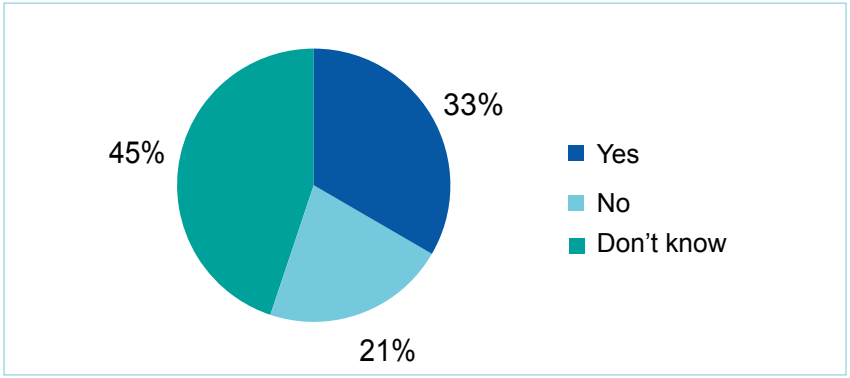
Q30. Has your IGCP project contributed (to date) to increased understanding of geological processes of relevance to:



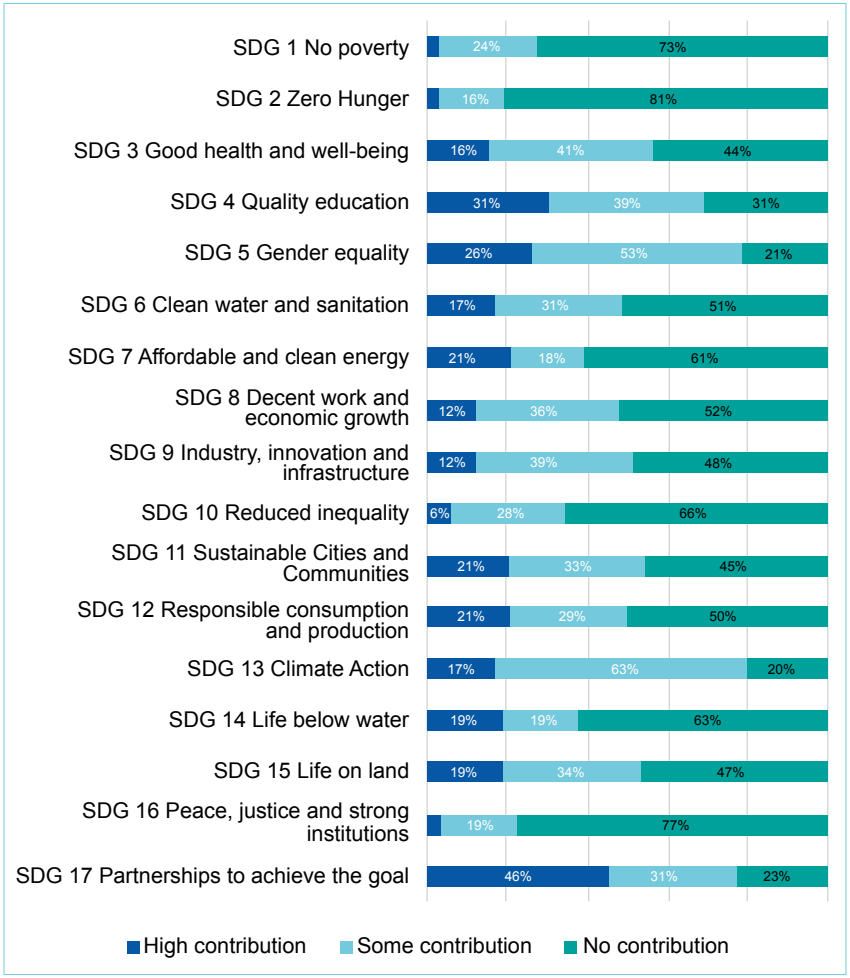
Q31. Has your IGCP project contributed (to date) to increased understanding of geological processes among:



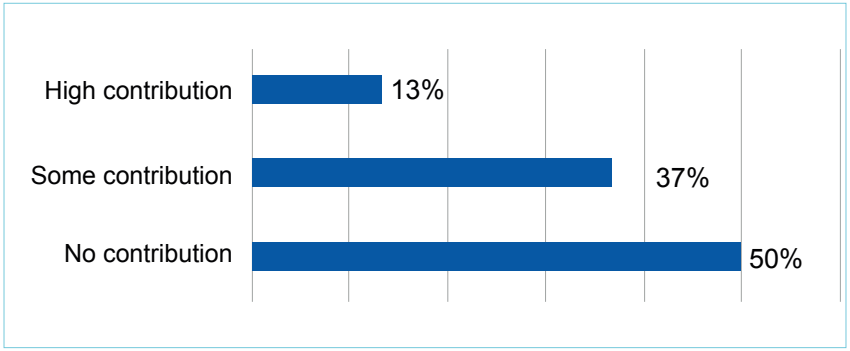
Q32. Are you aware of the outputs of your research being adopted or used by decision makers in government or the private sector (e.g. to support sustainable development, geological risk reduction, climate change action, protection of geological heritage, etc.)? Even if this activity is at an early stage, it is of interest to the evaluation



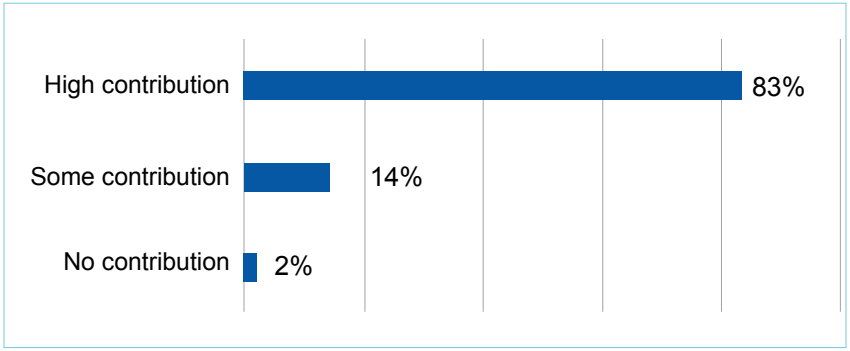
Q33. In your view, did your IGCP project contribute to the UN Sustainable Development Goals? If so, which ones:



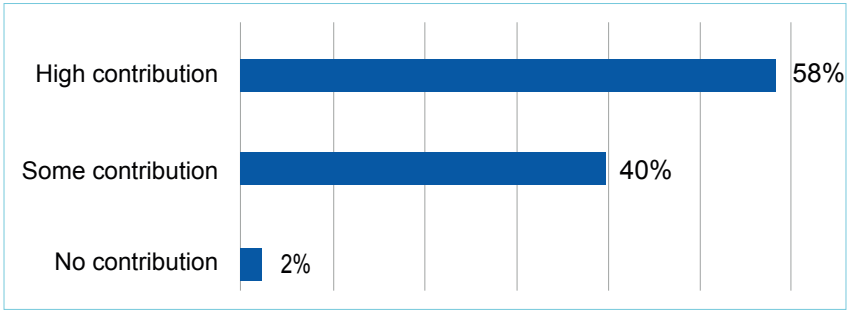
Q34. In your view, did your IGCP project contribute to the UN Sendai Framework for Disaster Reduction?



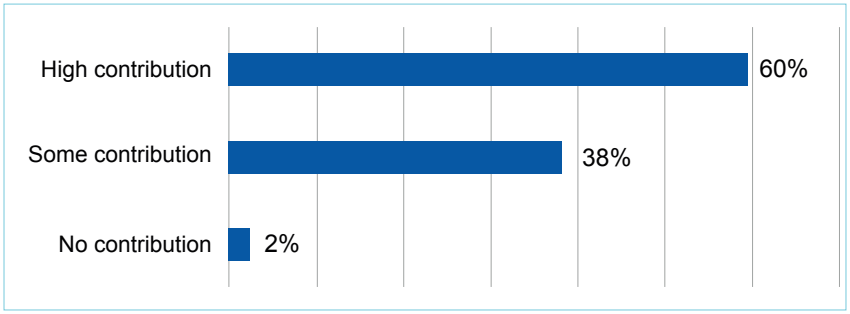
Q35. In your view has the IGCP project contributed to lasting stable and sustained international partnership and cooperation in geoscience?



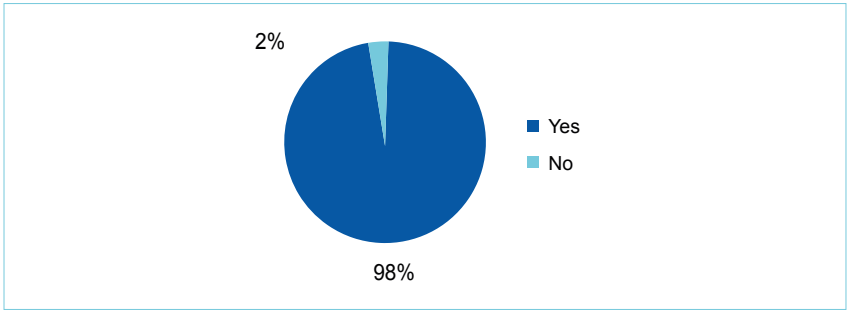
Q36. In your view has the IGCP project contributed to developing increased scientific expertise in the global south?



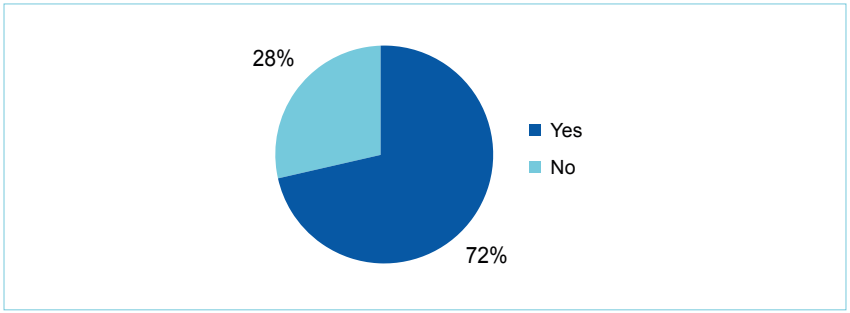
Q37. In your view has the IGCP project contributed to developing increased numbers of female geoscientists?



Q38. Would you recommend others to apply to the IGCP?



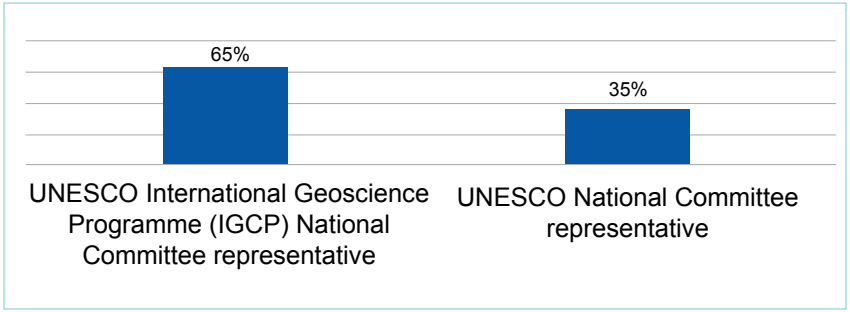
Q44. Are you happy for us to contact you about any of your responses to the survey?



A. 4 Results of the IGCP survey UNESCO National Commissions and IGCP National Committees

- Survey release date: October 31, 2019
- Survey closing date: November 27, 2019
- Total number of replies 20

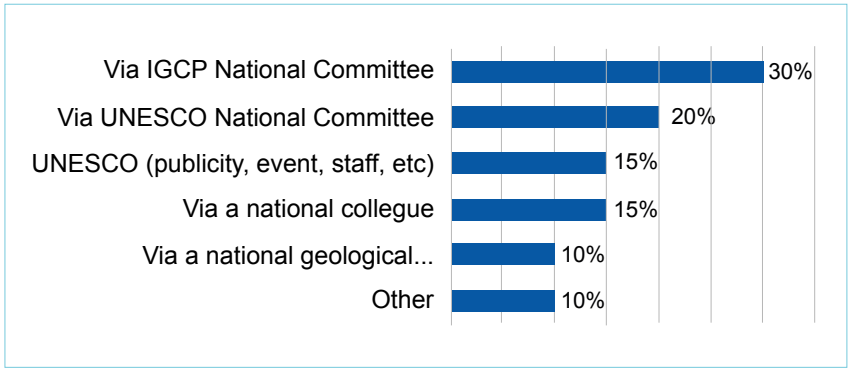
Q1. Please confirm your role as a UNESCO National Committee representative or a UNESCO International Geoscience Programme (IGCP) National Committee representative.....



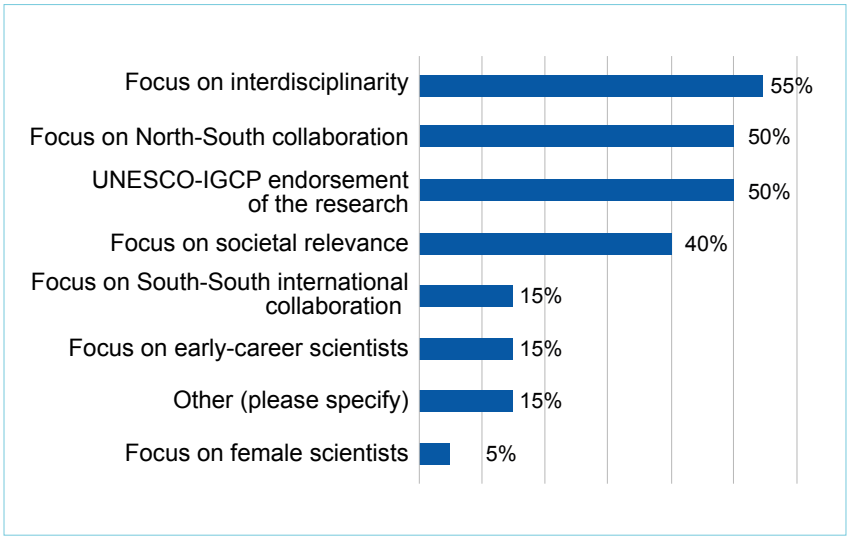
Q2. Please indicate the country you represent

- Australia ☐
- Austria ☐
- Brazil ☐
- China ☐
- Finland ☐
- France ☐
- Ireland ☐
- New Zealand ☐
- Portugal ☐
- Republic of Korea ☐
- Romania ☐
- Slovakia ☐
- Slovenia ☐
- South Africa ☐
- Spain ☐
- Turkey ☐
- Ukraine ☐
- United Kingdom ☐

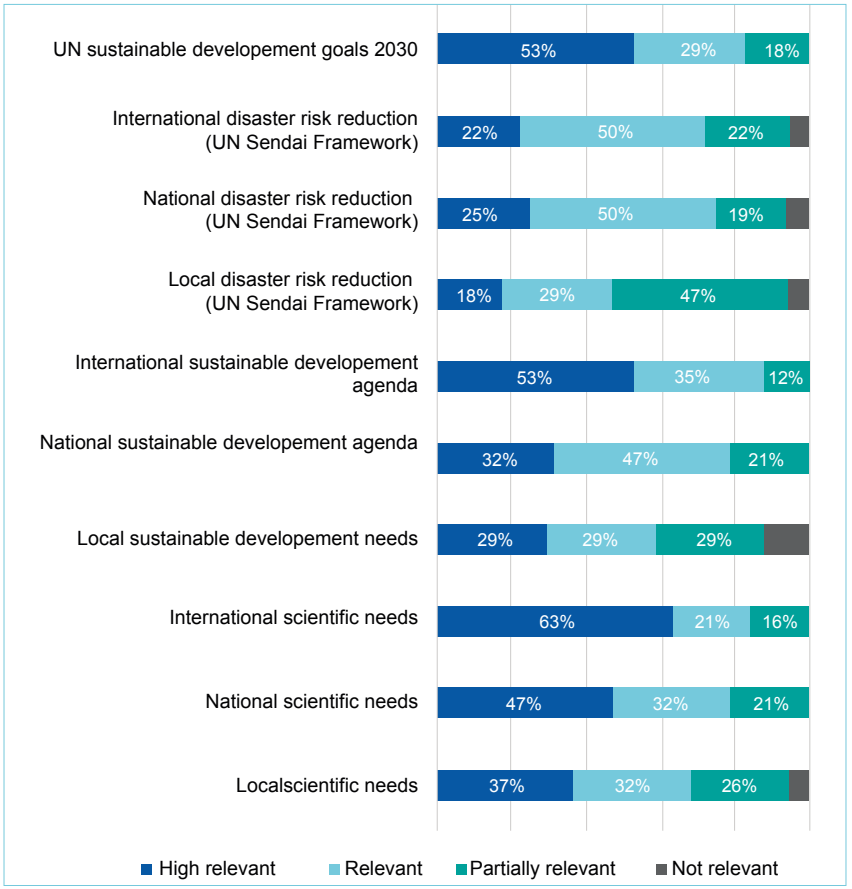
Q3. How did you first become aware of the IGCP?



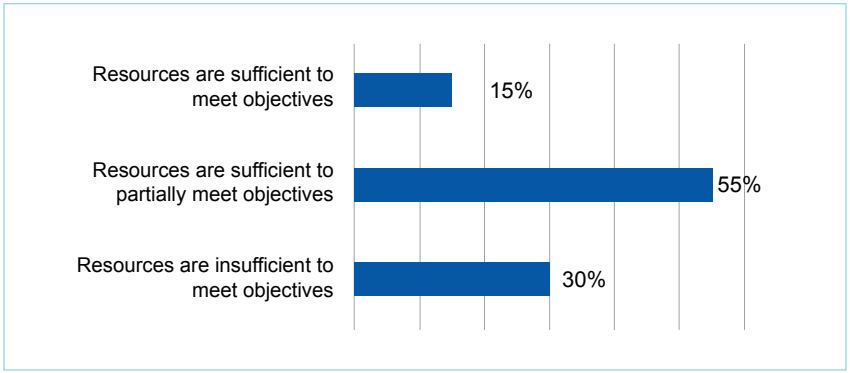
Q4. To your knowledge, what features of IGCP were particularly attractive to scientists in your country?



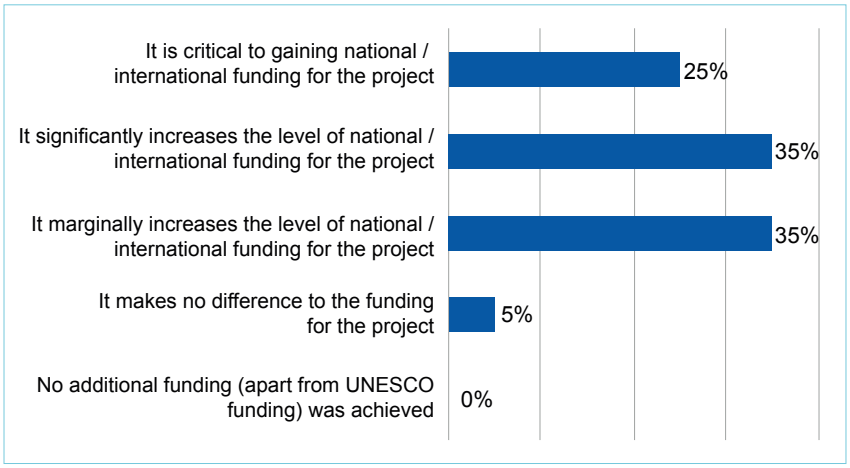
Q5. Is the design of the IGCP programme relevant to meeting:



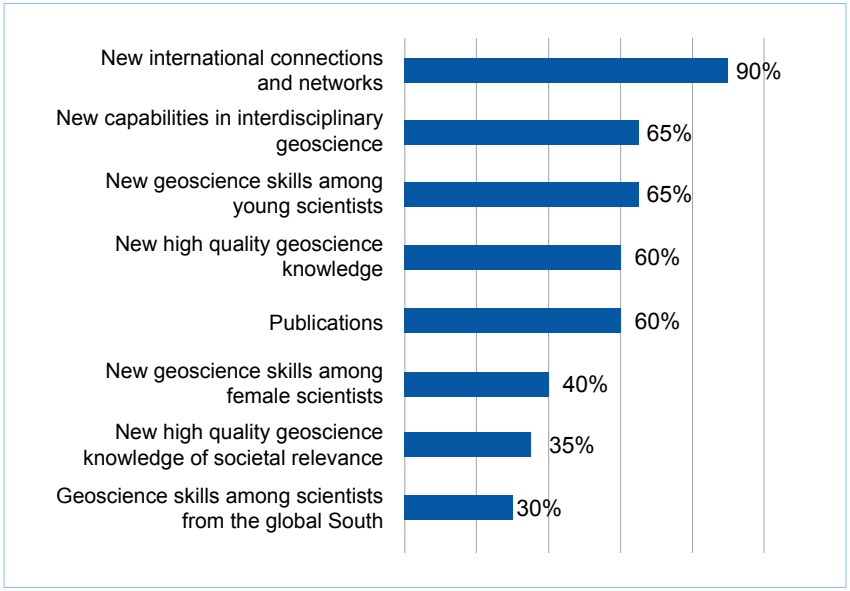
Q6. To what extent are the resources allocated to projects from IGCP appropriate to achieve projects' objectives?



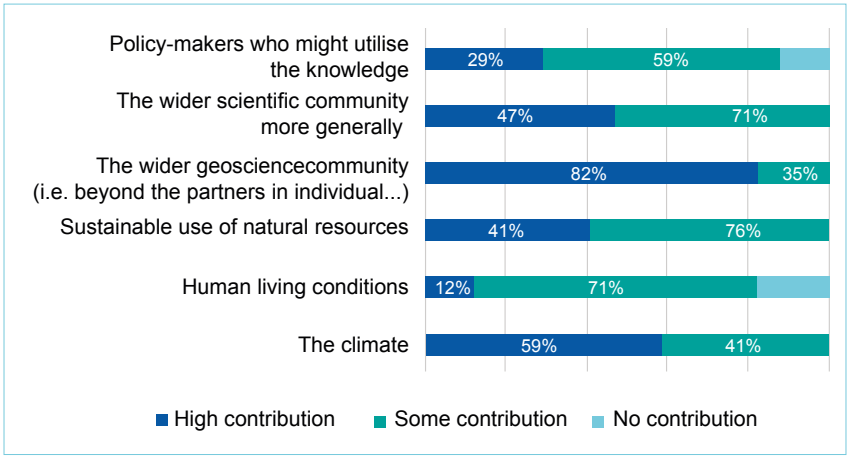
Q9. In your view, does achieving IGCP funding affect the total level of research funding to projects?



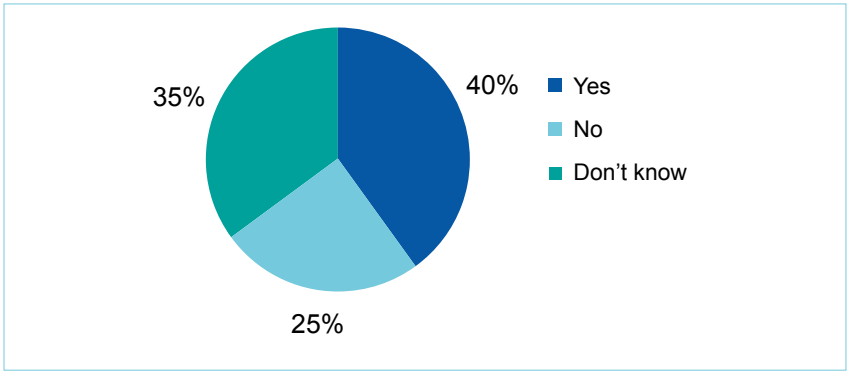
Q10. In your view, what are the key outputs of IGCP projects in your country?



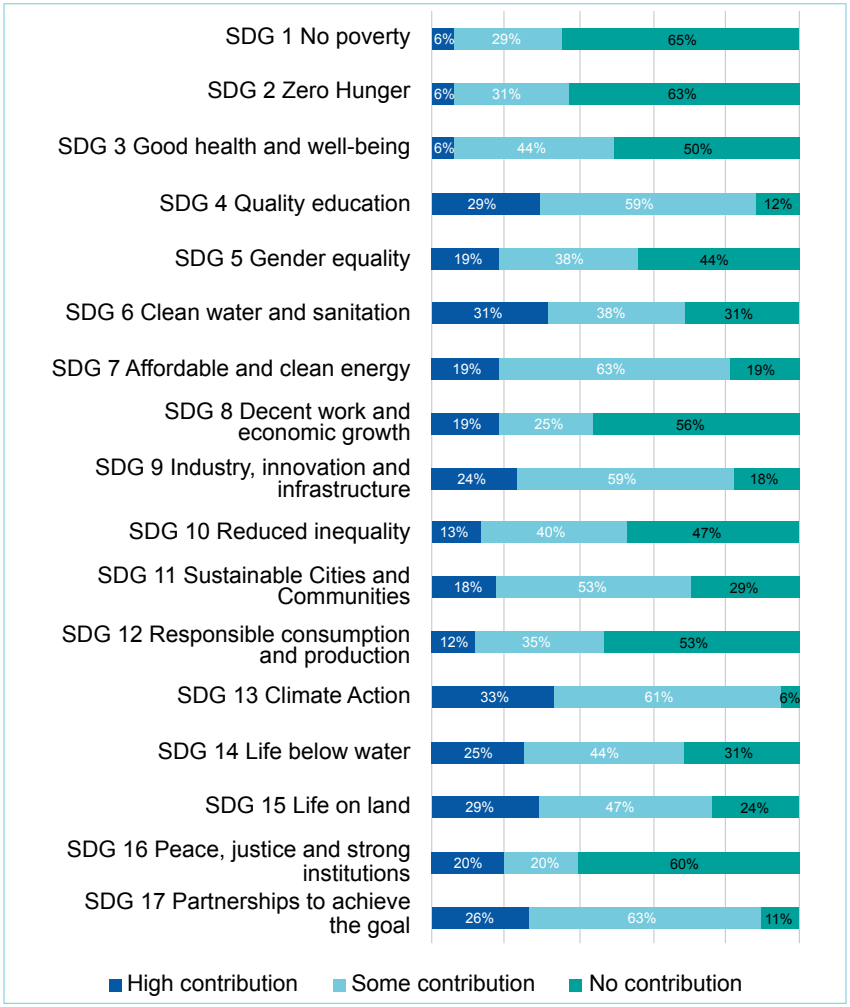
Q11. In your view, do IGCP projects contribute to increased understanding (in your country) of geological processes of relevance to:



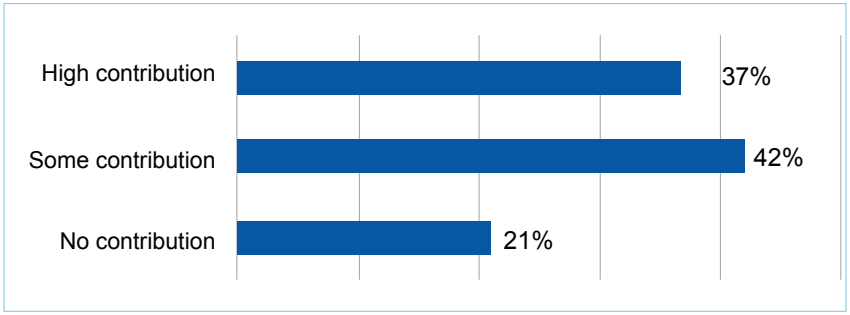
Q12. Are you aware of the outputs of IGCP research being adopted or used by decision makers in government or the private sector (e.g. to support sustainable development, geological risk reduction, protection of geological heritage, etc.)? Even if this activity is at an early stage, it is of interest to the evaluation



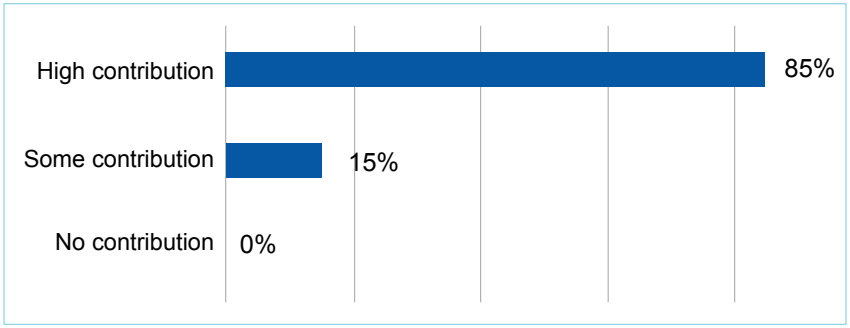
Q13. In your view, do IGCP projects contribute to the UN Sustainable Development Goals in your country? If so, which ones:



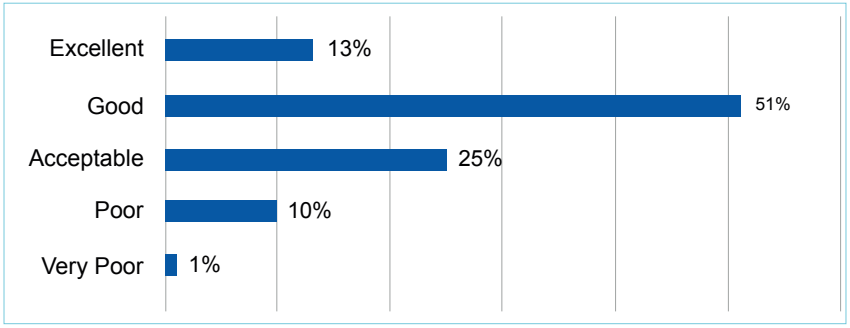
Q14. In your view, do IGCP projects contribute to the UN Sendai Framework for Disaster Reduction?



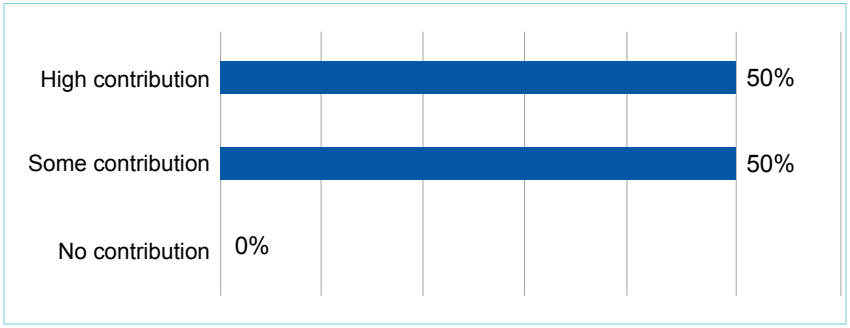
Q15. In your view, do IGCP projects contribute to lasting stable and sustained international partnership and cooperation in geoscience?



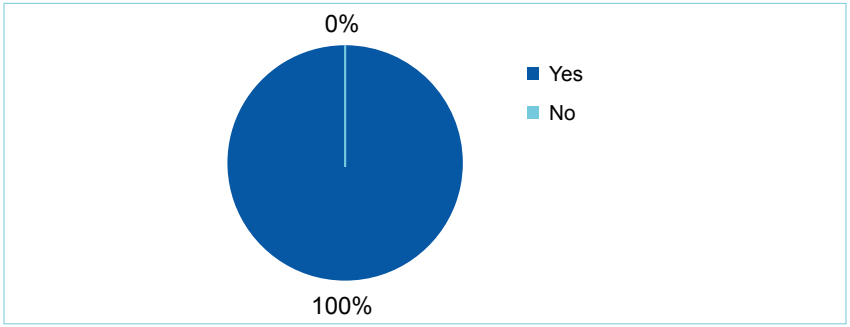
Q16. In your view, do IGCP projects contribute to developing increased scientific expertise in the global south?



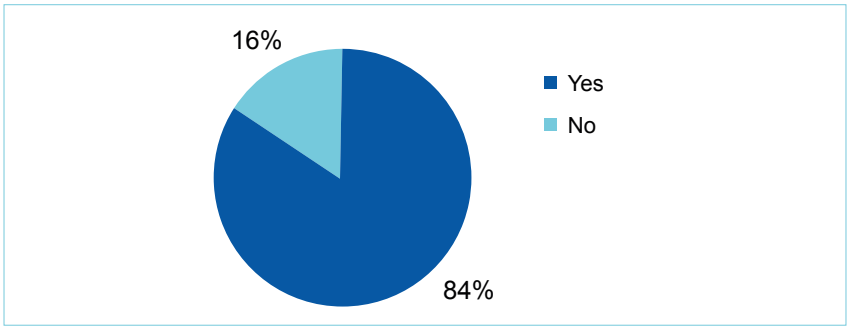
Q17. In your view, do IGCP projects contribute to developing increased numbers of female geoscientists?



Q18. Would you recommend scientists in your country apply to the IGCP



Q24. Are you happy for us to contact you about any of your responses to the survey?



E. Appendix E. Case studies

UGGP Case Studies

A.5 Case study Xingwen UNESCO Global Geoparkç

1. Introduction

The case study is a part of the evaluation of the UNESCO International Geoscience and Geoparks Programme (IGGP) carried out by Technopolis Group on behalf of the UNESCO Internal Oversight Service (IOS). The case study is one of the several data collection methods used within the evaluation together with documentary review, semi-structured interviews and a survey. The purpose of the study is the direct observation of the Xingwen UNESCO Global Geopark with a focus on gathering of evidence of its impact on local communities.

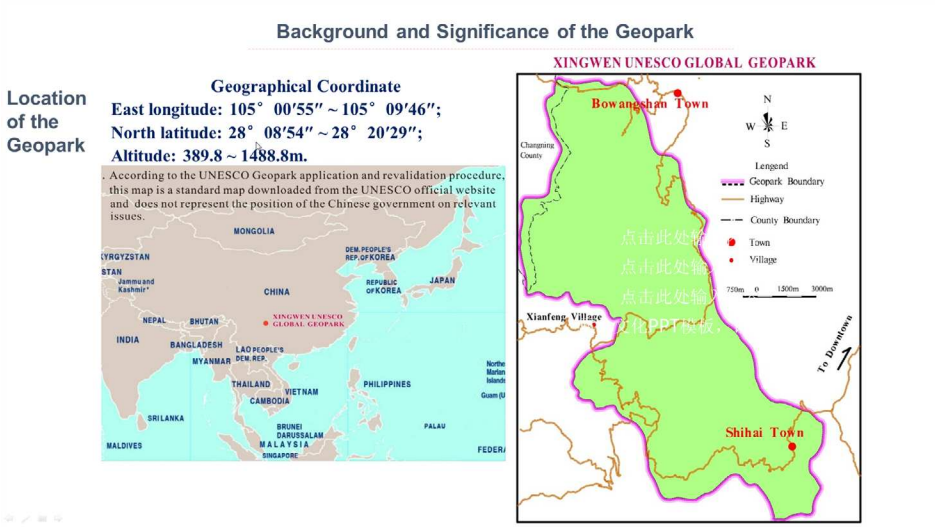
One of the main reasons for choosing Xingwen UNESCO Global Geopark as a case study is the fact that China is the country with the biggest number of geoparks (37 as of November, 2019). Besides that, Xingwen became an UNESCO Global Geopark more than 14 years ago which allowed for sufficient time for the impacts to materialise. Xingwen geopark does not have any other UNESCO designation such as Man and Biosphere (MAB) or a World Heritage Site (WHS) meaning that all observed impacts can be attributed to the global geopark designation. It has to be noted that before becoming an UNESCO global geopark Xingwen was a provincial and a national geopark for a brief period of time.

The study was drafted after a two-day visit to the geopark at the end of November, 2019. The visit consisted of a number of meetings with the geopark administration, the local authority, a local school, an agricultural cooperative, local companies, local museums, restaurants, cultural villages and a bed and breakfasts operator.

Xingwen County is located in south-east Sichuan with a territory of 1,379 km2. There are eight towns and four Miao villages in the county, with a population of 488,900 inhabitants. The minority group counts for 52,600 inhabitants or 11% of the total population. Remnants of another minority group – Bo – are present on the geopark territory.

Xingwen County is considered a poor county in Sichuan, with 57,000 people who were living in poverty around the time of the establishment of the geopark. By 2019, all people from Xingwen County have got out of poverty. There are 14 villages in Xingwen UNESCO global geopark, with a population of 15,000 (all of them Miao indigenous people), with some 2,600 people in six villages who were living in poverty.

Figure 1, Figure 2 Location of the geopark in China and map of the geopark



Source: Geopark administration

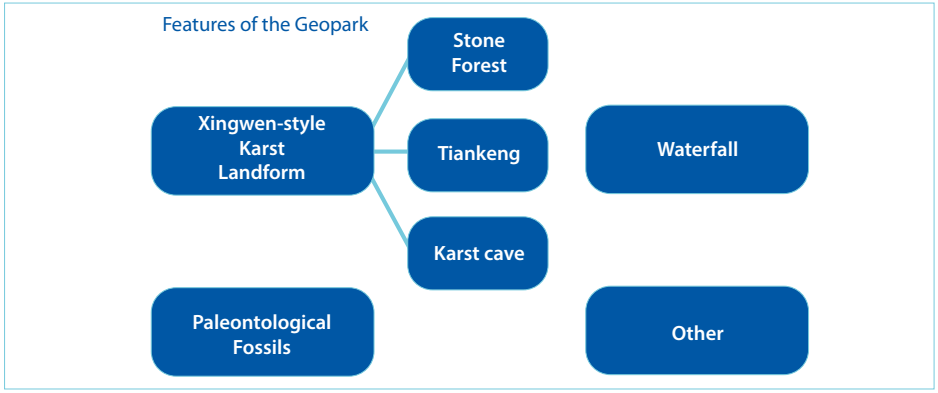
2. Overview of the UNESCO global geopark

Key facts	
Official name	Xingwen UNESCO Global Geopark
Location	Sechuan Province, Xingwen County, China
Surface covered by the geopark	156 km2 and four scenic areas: Xiao Yanwan Scenic area, Bo Wangshan Scenic area, Tai'an Scenic area and Ling Xiaoshan Scenic area.
Name of managing structure of the geopark	Administration of Xingwen UNESCO Global Geopark
Date of initial designation	02/2005
Date of subsequent revalidations (if any)	2009, 2013, 2019
Other designations	China's national scenic area\China national geopark

3. Brief presentation of the geopark and key geological significance

The park has undergone a long period of geological evolution. The strata are mainly constructed of carbonate and clastic rocks, creating rich karst-based geological relic landscapes. Geological sites include the world-class tiankeng, karst caves and stone forests. This typical karst was named as «Xingwen style carst. The Geopark is a study site for macro characteristics and micro mechanisms of karst. The strata

Figure 3 Geological features of Xingwen UNESCO Global Geopark



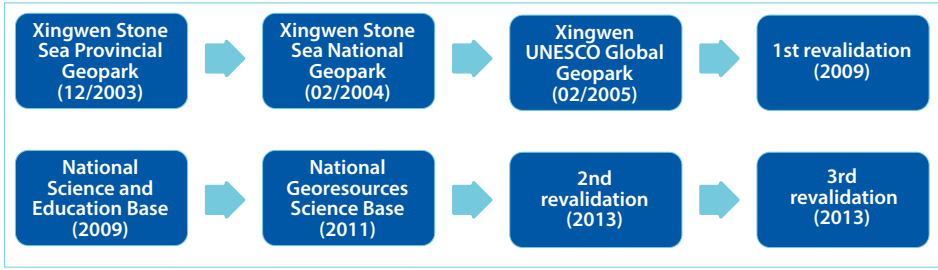
Source: Geopark administration

The geopark also contains paleontological fossils of salamander, brachiopod, foraminifera, etc. There is a rich diversity of biological species on the territory of the geopark including bamboo forests, tree fern, Chinese yew, Liriodendron Chinense, etc. Prominent animal species include giant salamander, blind fish, egret and Chrysolophus Pictus.

4. History of the geopark:

Xingwen Stone Sea Provincial Geopark was approved in December, 2003. In February, 2004 Xingwen became a national geopark. The geopark was awarded an UNESCO Global Geopark designation in February, 2005. Xingwen Global Geopark Regulation was published in 2009 while the Xingwen Global Geopark Plan (2010-2020) was released in July, 2010.

Figure 4 Timeline : from a provincial geopark to an UNESCO Global Geopark



Source: Geopark administration

The geopark management refers to the phase of establishment of the geopark as the construction stage as quite a lot of physical transformation of the area took place. For example, the dump site for a Sulfur Factory near the park gate before the establishment of Xinwen Geopark, has been transformed to a parking lot.

The geopark administration and local authorities identified several main motivation factors for creating and developing the geopark:

- Better protection of the scenic area and geological sites through improving population awareness of the geological heritage in the region. It has to be kept in mind that this was and continue to be the main focus of the national and provincial geopark programmes;

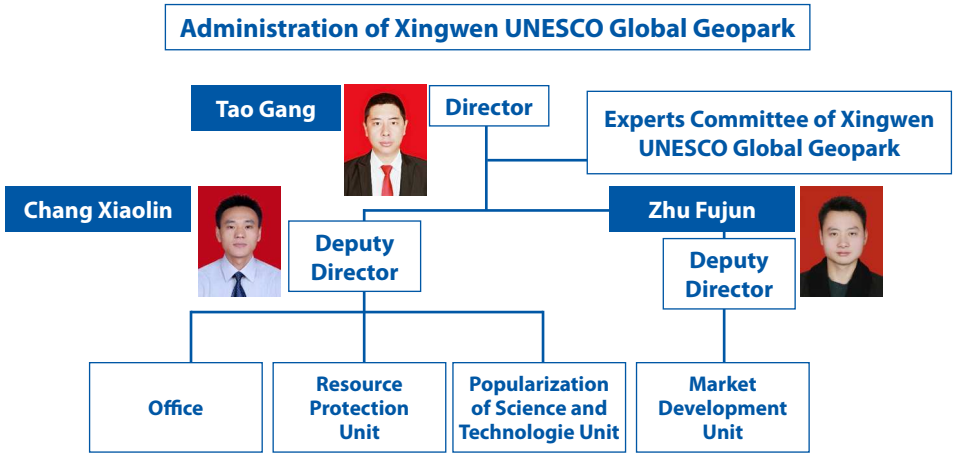
- Ensuring sustainable use of the natural and cultural resources in the area;
- Improving the economic development of the area and increasing the income of local people and the local minority through boosting sustainable tourism. The expectations were to gain additional visibility nationally and internationally.

The establishment of the geopark has followed a clear top-down approach coming from the central administration (Ministry of Land and Resources) and the local government.

5. Management structure

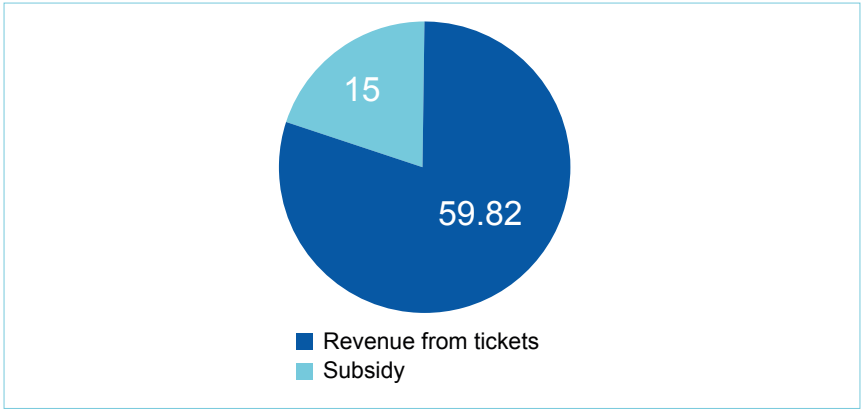
The geopark has a simple **management structure** whereby the director of the geopark is also a Vice Governor of Xingwen County People's Government, Sichuan Province in this way providing a tight link with the local authorities. There are two deputy directors and a number of small units under each of them dealing with different aspects of the functioning of the geopark. The staff of the geopark consists of nine experts (8 FTE). Reportedly, the smooth link between the geopark and the local authority is guaranteed by the fact that the geopark director is an employee of the local authority.

Figure 5 Administration of Xingwen UNESCO Global Geopark



Xingwen geopark has two main sources of revenue: approximately 80% come from ticket sales while the remaining 20% are subsidies from the local administration.

Figure 6 Geopark revenues in million Yuans



Source: Geopark administration (1 EUR = 7.77 RMB)

All activities of the geopark are covered from these revenues. Naturally, there are many other business activities in the geopark and associated with the geopark. As the geopark cannot form a profit from an accounting point of view revenues and expenditures need to be balanced.

6. Relevance of the UNESCO global geopark designation

The relevance of UNESCO Global Geopark designation is high. The UNESCO Global Geopark concept fits with a very strong national geoheritage conservation agenda and a powerful poverty alleviation and poverty elimination directives coming top-down from the central government of China to Sichuan Province government and the local authorities of Xingwen County. At the time of the application, the UNESCO Global Geopark designation was especially attractive for the local administration and the geopark because of its local economic development focus as opposed to the conservation-only focus of the provincial and national geopark designation. Xingwen Province had a high level of poverty in 2005.

In hindsight, the geopark administration considers its initial motivation on conservation and local economic development as still valid.

7. UNESCO global geopark designation and revalidation process

The geopark followed strictly the rules and guidelines in terms of expression of interest, preparation of the application. The geopark management finds the process professional and scientific but considers that there is a certain level of overlapping information in Form A and Form B. Additionally, the objectivity of the scoring systemin Form B is questionable to the geopark and there is no clarity how the scoring of individual criteria is done and the threshold under which a geopark could potentially get a yellow card.

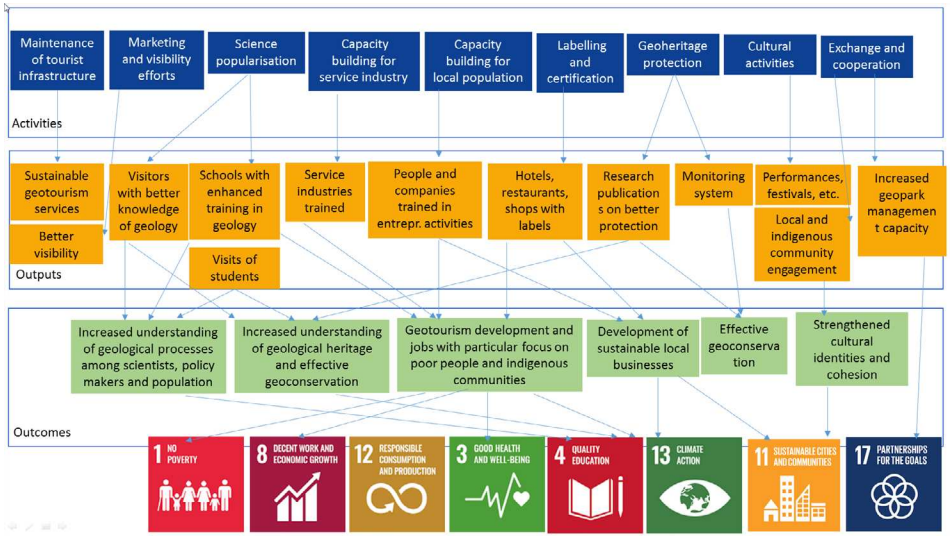
The feedback provided by the evaluators at the time of the initial evaluation and subsequent revalidations has been very helpful for improving the already very smooth functioning of the park. For example, during the 2017 revalidation a recommendation was given to improve the separate waste collection and recycling system in the park. The geopark administration implemented the recommendation and what is more, the local authority launched a 100 million+ RMB project on implementing an enhanced separate waste collection and recycling project in Xingwen County. This is a clear example of a spillover effect from the geopark to the county.

The support provided by UNESCO UGGp Secretariat and by GGN during the process of evaluation and revalidation has been assessed as useful. Nevertheless, the geopark considers the process to be expensive and too frequent for a geopark who has demonstrated high level of commitment and excellency. The suggestion would be to shift to a five or six years between revalidations or to draw a random sample of geoparks to be revalidated each year. The revalidation process is also a source of anxiety because of the insecurity around the scoring methodology.

8. Results and impact of the UNESCO global geopark

The geopark has a monitoring system in place and could readily report on precise numbers of different activities and outputs. The benefits of the UNESCO global geopark designation have been reported to significantly exceed the costs. In the graph below, we have attempted to reconstruct the impact pathways from activities through inputs, outcomes and impacts. These pathways confirms by and large the assumptions made in the Intervention Logic in the Inception Report of the evaluation.

Figure 7 Activities undertaken by the park and associated outputs



Source: Own compilation

9. Geopark activities and outputs

The geopark implements the following categories of activities:

- **Maintaining the physical infrastructure** within the park which includes secured paths, platforms, security railings, buildings, stations for waste separation and sewage treatment. The outputs of these activities are concrete and aim to improve the visitor's experience and security. The geopark is mindful about the problems of handicapped people by providing access to facilities and wheel chairs.
- **Marketing and visibility efforts** related to installation of billboards, signs, etc. aiming to make the park more visible and accessible. The geopark administration is aware that one of the natural drawbacks of the geopark limiting the number of visitors is its relatively low accessibility. Nevertheless, on the table below we can observe a sixfold increase of the number of visitors compared to 2004 and 12 times more revenues from entrance fees. The situation is expected to change dramatically for the better at the end of December, 2019 when a speed train will reach the city from Chengdu, the 20 million capital of Sichuan, in less than two hours. This is expected to increase the number of visitors significantly.

- **Science popularisation activities** targeted at visitors and at schools. It has been cooperating actively with two schools and one more will be added in 2020. Concrete activities include geology education; science travel notes competition; garden activities for adults with disabilities; stimulating teaching practice within the geopark for graduates of relevant specialities; organizing the World Earth Day and a National Science Popularisation Day. The purpose is to increase the understanding of the geological science and geoheritage conservation among the general public and children in particular. The park also hosts visits of geology students who study the geological phenomena at the geopark. The geopark maintains a museum with information on the geology, biodiversity and culture on the territory of the park. There is a margin for improvement of the exhibition and its presentation.

- **Launching the Research Centre of Sustainable Development and the Monitoring Station of Conservation of Geosites and Environmental Protection** in 2013 in this way combining the research and sustainability agenda. They have been founded to 'monitor the geoheritage and environment of caves and make contributions to the development of the geopark and the local economy'.

- **Capacity building activities for local service industry and entrepreneurs.** On one hand these are targeted at the service industry such as restaurants, hotels and B&B with the purpose of improving the tourist offer and experience. Tour guides and park management training also take place. On the other hand the geopark organises capacity building for local entrepreneurs to increase their entrepreneurial capabilities. Topics include marketing, starting a business, accounting, etc. Two trainings are organized per year for a total of eight trainings during the past four years.

- **Cultural activities.** Because of the Miao minority the geopark organises a number of cultural activities, festival and entertainment, ethnic handicrafts, clothing culture. These integrate the geological aspect of the geopark and the cultural texture of local people. The 15,000 Miao community living on the territory of the park is widely present during a visit and gives the specificity of the geopark in addition to its geological features. A traditional Miao village has been preserved and is currently a place where visits and cultural activities such as dances take place.

- **Support to different types of entrepreneurial activities** on the territory of the geopark known under the term agritainment coming from agriculture and entertainment. Agritainment includes mostly B&Bs and hotels in rural setting but also educational activities linked to the agriculture. Three hotels and eight B&Bs are partnering with the geopark out of which three have been endorsed with a label. A rice field on the territory of the park is used for the purpose of agritainment. These activities also include the offer of local products such as: ecological food; drinks (i.e. kiwi wine); local Miao cuisine; and traditional folk crafts (clothes, toys). These are offered in a shop and on stands around the geopark offered to local producers free of charge. For example, the geopark is partnering with three individual mid-size companies (i.e. a rapeseed oil mill) by providing its label.

- **Ecology restoration activities** are undertaken on the territory if the geopark in this way contributing to the fight against climate change.

The participation in the UGGp has increased significantly the geopark's capacity to conduct these activities and deliver such results and in this way the UNESCO Global Geoparks designation is making a huge difference.

10. Geopark outcomes and impacts

First and foremost, the Xingwen UNESCO Global Geopark has had a **tangible impact on reducing poverty and on strengthening the local economy** in this way contributing to SDG 1 No Poverty and SDG 8 Decent work and economic growth and SDG 11 containing an element on sustainable communities. The villagers from the Miao community were living in poverty before the geopark activities and associated tourism took off. Miao inhabitants are involved in cultural activities as well as the service economy. In the absence of the geopark Miao men and women would have left for the big city looking for a job. Keeping families together also contributes to the cohesion of the community. Additionally, the geopark has supported multiple families on the territory of the geopark to start sustainable businesses such as rice production, tangerine cultivation, etc. in this way contributing to SDG 8 Decent work and economic growth.

Hongyu Village is located at the East Gate of Xinwen Global Geopark. There are 10 villager's groups, 435 households, with a population of 1,688. Based on the advantages of the Geopark and its specialty, the village has become a major base for growing tangerines covering a land of over 5,000 acres, which has brought over 8.5 million yuan to the village, appr. 22.368 income for every household.

The village has successfully held the "Hongju Cultural Festival" 3 years in a row. The festival has made the local tangerines better known , promoting the development of the tourism of Shihai Town.

The increase of tourist numbers **increased job opportunities** for the Miao people in entertainment, service industry, local agriculture, product development, etc. Xingwen UNESCO Global Geopark also combines its science and poverty alleviation agenda by supporting local students earmarking one Yuan from each entry ticket directed for student subsidies for junior and senior middle class school students. Some 278 students have been supported through the programme so far.

The geopark activities on **geological science and science popularisation** lead to increased understanding of geological heritage and geological processes and contribute to a large extent to SDG 4 on quality education.

It could be stated convincingly that none of these impacts would have existed without the establishment of the Xingwen UNESCO Global Geopark.

11. Factors of success & challenges to implementation

The following factors of success have been identified by different interviewees:

- Strong financial and administrative support from the local government and the national government. Another dimension of this support is the fact they pushed the integration and strong coordination of different departments from the local administration as long as the support to the geopark is concerned.
- Strong sense of responsibility of the management of the geopark. The development of the geopark has been compared to building a business which requires dedication and responsibility.
- Strong support from representatives of the local community including schools, village committees, local companies, etc.

12. Sustainability

The stable finances of the geopark are considered as the main factor for its sustainability. The revenues from the geopark entrance fees are expected to grow due to the growth of visitors per year. The launching of a fast train from Chengdu to Xingwen is likely to boost weekend tourism from the capital of Sichuan (20 million inhabitants). The geopark management does not envisage increasing the level of the entrance fee which is currently around 10 EUR/person.

There are no concerns that the geopark might reach a visitor saturation point which was estimated by the management at around 2 million visitors per year far from the current 500,000 visitors. Naturally, seasonality matters.

The sustainability of the park is closely linked to the quality of the service industry such as hotels and restaurants which needs to provide a high-quality service. Therefore, the geopark invites external experts to provide trainings on topics such as: increasing the quality of services; technical improvements; handicrafts, etc.

The geopark outcomes and impacts are likely to be sustained in the future but the financial and organizational sustainability of the geopark is a condition for that.

The UGGp Secretariat is instrumental in providing the overall conditions for the functioning of the geopark and for facilitating fair and objective criteria and their implementation but is not instrumental in guaranteeing its sustainability. It should, of course, guarantee a fair process for revalidation of the geoparks and maintain, together with the GGN, the exchange and capacity building activities for the geopark management.

The geopark did not identify any particular way for GGN and the UGGp Secretariat in supporting the sustainability of the park rather than through

13. Partnership and cooperation

In case the geopark needs support, it turns to the Chinese Geological Network (CGN) based in Beijing. The geopark seldom communicates with the Asia-Pacific Global Network (APGN) besides visiting the biannual conferences and exchanging information with other geoparks. The geopark also cooperates with other Chinese nature protection areas and their networks.

Xingwen geopark actively cooperates with several sister geoparks: Zhijindong Cave Geopark (China); Sobrarbe UNESCO Global Geopark (Spain); Papuk UNESCO Global Geopark (Croatia); and Stone hammer UNESCO Global Geopark (Canada).

Xingwen geopark administration would be willing to increase their Chinese and global exposure and share experiences with other geoparks. One way this has been

happening is through the conferences organised by the Chinese Geological Network and the national administration in charge of the geoparks.

The geopark is also collaborating with the Geoparks and Geoheritage Research Centre doing work on the geological significance of the geosite. It is also working with the Sichuan Bureau of Geology and Mineral Resources In Chengdu.

As described earlier partnership with a number of local schools have been established as well as partnerships with hotels, restaurants, shops, B&Bs, local businesses, etc. The geopark logo and certification is visible and serves as a stamp of quality. Partnership with local companies are also active and consist of providing the geopark label to its products.

14. Conclusions and key lessons drawn

The relevance of UNESCO Global Geopark designation is high. The UNESCO Global Geopark concept is aligned with a very strong national geoheritage conservation agenda and a powerful poverty alleviation and poverty elimination agenda of the Chinese government. The move to become an UNESCO Global Geopark was made as the conservation-only agenda of the Chinese national geoparks was not sufficient for a poverty-stricken region. Other UNESCO geoparks and aspiring geoparks can should consider a string alignment between national, regional and local priorities with the geopark concept and its main pillars.

The application, evaluation and revalidation process has been relatively smooth and the geopark always excelled in these. The recommendations of the evaluators have been very useful and have triggered real improvements in the geopark. After many years of excellent performance the revalidation frequency of four years is considered too short.

The geopark undertakes a wide spectrum of very successful activities including maintenance of the geopark infrastructure for better tourism experience; extensive marketing and visibility efforts; science popularisation activities; active support to local entrepreneurs; labelling for local service industry, producers and agriculture; climate change adaptation efforts through ecology restoration; and a wide range of cultural activities. Current and aspiring geoparks can take inspiration in many individual activities weaving together scientific, educational, ecologic, economic and cultural aspects.

The geopark has produced significant impacts on understanding of geological processes and geoconservation among the local population and the visitors; geotourism and cultural tourism development with a focus on local indigenous population; development of sustainable local businesses; and strengthened cultural identity and cohesion. These outcomes can be related to a number of SDGs such as SDG 1 No Poverty; SDG 8 Decent work and economic growth; SDG 12 on Responsible Consumption and Production; SDG 4 Quality Education; SDG 13 Climate Action; SDG 11 Sustainable Cities and Communities and SDG 17 on partnership. The contribution to the remaining SDGs has been minor.

The main factors for the success of the geopark include the strong support from the local, provincial and national government; the lean organisational structure and the level of professionalism and dedication of the directors and the employees; as well as the strong support from the local community. Any current and aspiring UNESCO Global Geopark could be inspired by the solidity of these three conditions.

The geopark seems to be on a good way for a bright future given the sustainability of its finances and the high probability of an increased number of tourists. The support of the local administration is stable and likely to continue to be stable. The geopark is a main instrument for poverty alleviation in the County. The role of the UGGp Secretariat and GGN to enhance the sustainability of the geopark would be limited to providing a fair and transparent framework of operation and opportunities for exchange and further capacity building. Maintaining and nurturing the factors of success seems to be the best approach to securing the sustainability of geoparks.

The geopark is operating in a context of active partnerships with the local, provincial and national authorities as well as with relevant geological and research institutes. The geopark participates in trainings and events organised by GGN, APGN and others and would be in a good position to share its success with others.

A.6 Case study of the Mixteca Alta Geopark in Oaxaca Mexico

1. Overview of the UNESCO global geopark

Key facts	
Official name	Mixteca Alta Geopark
Location	State of Oaxaca, Mexico. The Geopark includes 9 municipalities of the district of Nochixtlán, State of Oaxaca.
Surface covered by the geopark	421,5 km2
Name of managing structure of the geopark	Asociación Geoparque Mixteca Alta
Date of initial designation	05/2017
Date of subsequent revalidations (if any)	None to date

1. Brief presentation of the geopark and key geological significance

The Mixtec Alta Geopark is located in the Mexican region of Oaxaca, which is located on the Pacific coast of southern Mexico. Oaxaca has historically been one of the country's poorest regions, despite being home to a tremendously vibrant and rich cultural landscape, as well as to some of the country's most visited tourist destinations. The geopark draws its name from the fact that its located in the Mixteca region of the state, which is named after the Mixteca civilizations which flourished there prior to the arrival of the Spanish colonizers. The Mixteca Alta section of the region is interesting because it's there that two of the country's mountainous chains meet - the Sierra Madre del Sur and the Sierra Madre Oriental – creating the 'Mixteca knot'.

The Mixteca Alta has some of the most important traces of Mesoamerican culture and has continuously hosted human populations for thousands of years. It's characterized by a variety of erosional features strongly related to natural climate changes as well as consequent traditional farming practices carried out over the last 3500 years. As explained in the evaluation report (2017) the region is marked by badlands developed in the Palaeogene red beds of the Yanhuitlán Formation. This formation, composed mostly by montmorilonitic clayish deposits, is heavily eroded and the original vegetation is restricted to small patches of oak pine forest at high altitudes. These erosional features include gullies, badlands, erosive amphitheatres derived from fluvial and mass wasting processes, alluvial deposits, paleosols, and water and sediment terracing traps used for farming purposes (locally known as lamabordos). Other sites of interest in the geopark include examples of intrusive magmatic dikes, spheroidal weathering and sites of paleontological interest. As mentioned by the evaluators, "despite the fact that (the geopark's) geological processes and landforms are quite common and universal, the relation of these with early human occupation and use of a very homogeneous geological landscape, even integrating the deepest symbolic meaning, with the early development of agricultural techniques that are still in use, a long tradition in pottery making and the effective projects against erosion, make this geopark a very coherent cycle of sedimentogenesis morphogenesis pedogenesis with singular attributes among UNESCO Global Geoparks, a soil and erosion laboratory, and a great opportunity to transmit the importance of the concept of Geoconservation". Given these particular attributes, the geopark project is strongly developed around the concept of "Erosion, Culture and Geoheritage".

In addition to its geological properties, it's also worth mentioning that the Mixteca region where the geopark is located is also characterized by extreme levels of poverty. It's estimated that the regional has 36,5% of its population living in extreme poverty, which is twice the national average of 18,8%. As is the case for many other Mexican regions, the Mixteca has also lost much of its productive labour force given the high levels of emigration to the United States. These very particular conditions have significant implications on the rationale of the geopark, as well as on its activities and results; particularly as compared to other geopark counterparts located in more developed countries or regions.

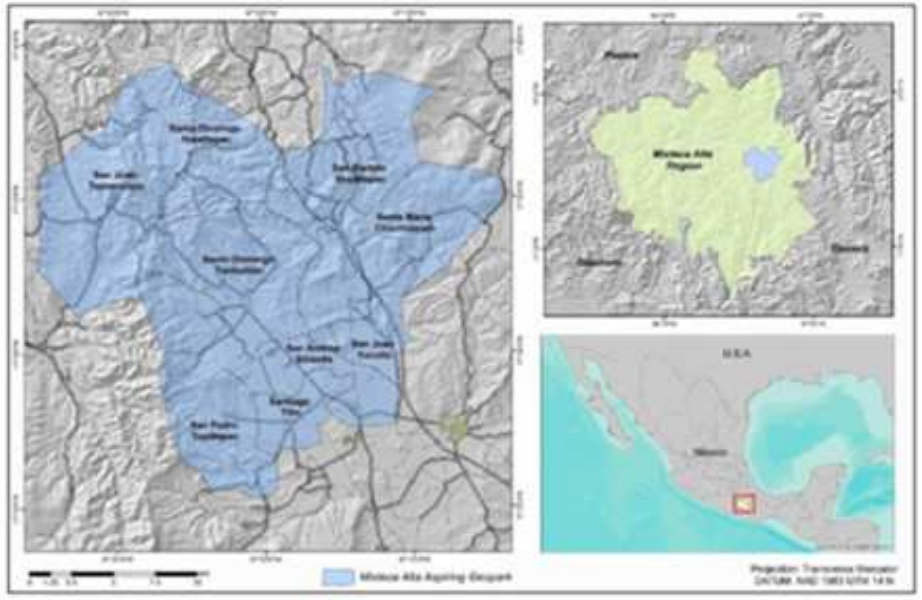


Figure 1: Location of the Mixteca Alta Aspiring Geopark, Oaxaca, Mexico.
Source: evaluation report (2017)

2. History of the geopark:

The Mixteca Alta is a very young both in absolute terms as well as with regards to the UNESCO Global Geopark validation. Compared to some of the European geoparks, the Mixteca Alta is at an infancy stage. The creation of the park was driven mostly by a group of researchers from the National Autonomous University of Mexico (UNAM) hosted by the institute of geography. One particular researcher, Dr. José Luis Palacio, appears to have been instrumental in driving this process and remains one of the central figures of the geopark. Dr. Palacio's first exposure to the work supported by UNESCO in the field of geoparks dates back to the early 2000's, when through his involvement in the international geographical union, he was invited to support the work carried out by the geological union in collaboration with UNESCO.

Based on the knowledge and experience gathered since then, Dr. Palacios decided to link the geopark approach to work being conducted in the Mixteca region of Oaxaca, which he considered to have a high potential of becoming a geopark because of its characteristics. According to Dr. Palacios, developing a geopark in the region made sense not only from the scientific standpoint, but also from an economic development standpoint given the region's poverty levels, social, and developmental challenges.

In 2014, representatives of the GGN were invited to Mexico to carry out a workshop on geoparks (Macever and Martini). According to Dr. Palacio, it was thanks to these workshops that some early geopark projects in Latin America starting to consolidate, and it provided some thrust as well to the early work to develop the geopark in the Mixteca Alta. Based on this, a team of UNAM researchers decided to support the development of a UGGp geopark proposal in 2015.

According to Dr. Palacio, developing the project was not an easy task. Challenges mainly stemmed from the fact that they were dealing with a territory and community that given their indigenous roots, tended to be skeptical about initiatives coming from the outside world. In addition, the territory is somewhat fragmented given the existence of 9 municipalities, as well as the existence of a traditional government and decision-making systems, based on local traditions. In spite of this, important efforts were carried out to raise awareness on the meaning of a geopark and its potential benefits, as well as to build buy in for the project from local stakeholders and community representatives.

This led to the development of a geopark proposal which was evaluated and approved in 2017 with a green card. It's worth noting that the entire process, from the early stages of introducing the geopark concept to obtaining the final approval, took approximately two years. According to Dr. Palacio, despite having been highly rewarding, the process also proved to be quite enduring. This is mainly related to the fact that it's difficult to keep momentum going for such an extended period of time, particularly among the local constituencies of the geopark. According to him, it often proved challenging to motivate local communities during this period in the absence of any tangible and immediate results along the way.

In hindsight, it appears that despite the importance of the role played by the UNAM in the emergence of the project, the project which submitted to UGGp for evaluation did have a strong backing of the local communities and key representatives of geopark territories. In addition to this and as will be explained in further sections of the case study, the geopark development process appears to have significantly (positively) influenced the levels of cooperation and understanding across local communities and administrations. The

emergence of the Mixteca Alta appears to be a balanced mix of top down support provided by the National University, and bottom-up support on behalf of local communities. This process has strongly influenced the level of ownership on behalf of the latter.

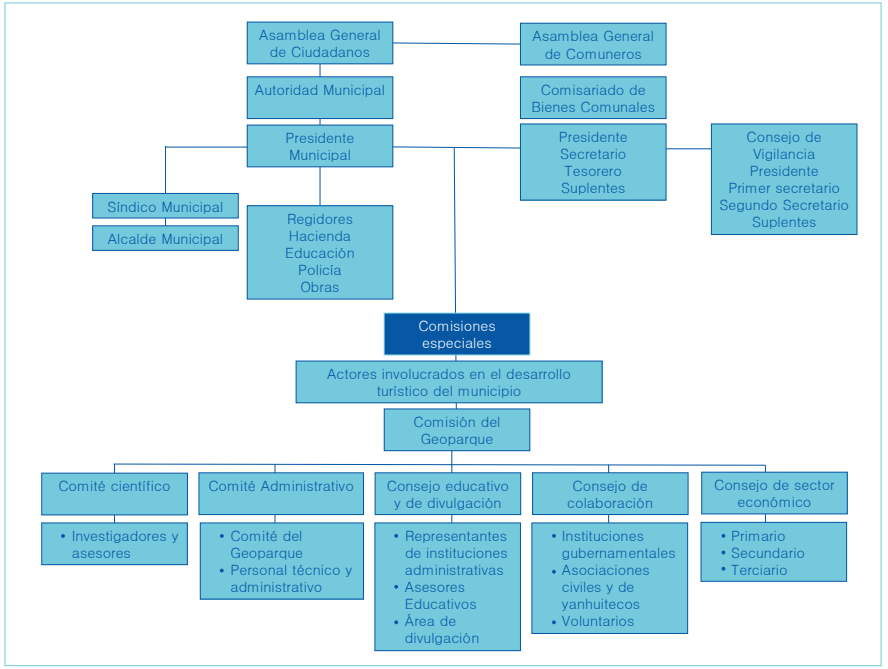
3. Management structure (a figure and a short description)

Mixteca Alta has developed a fairly complex, yet robust governance and management system. As illustrated by the following figure, the main governance body is the Geopark Commission, which has been place under the supervision of the two most important local authorities i.e. municipal authorities and communal goods commissaries. This Commission is intermunicipal in nature, and it includes representatives from all of the localities within the geopark. The Commission has a rotating presidency. The role of the Commission is to provide high level guidance and validate key strategic decision regarding the development of the geopark. There appears to be a strong level of involvement in the Commission by local municipal leaders.

The day to day activities of the geopark are overseen by the Geopark Committee which includes a number of members such as representatives from the scientific committee, operational staff members, representative from the different municipalities and geopark guides. Alongside the Geopark Committee, the Scientific Committee headed by the UNAM in charge of overseeing research activities and providing scientific guidance to the geoparks. Operational staff – excluding geopark guides and researchers from the UNAM – appears to be limited to 1 Full Time Equivalent. This team of two is mainly in charge of organizing Commission meetings, carrying out educational activities, representing the park in national and international fora, and organizing visits to the geopark.

Organized geopark visits are carried out by members of the geopark guides team which have been trained by the geopark, and do this work on a voluntary basis. Each participating municipality has designated two or three individuals to become guides. Guides are not employed by the geopark, nor do they do this on a full-time basis. When asked how often they were asked to lead groups, one guide said that this happened usually about three to four times per year. As will be illustrated in the following sections, the number of visitors to the geopark remains relatively low.

Figure 1 Overview of the Mixteca Alta Geopark governance system



The UNAM as one of the most important universities in Latin America, remains an essential partner in the project with a major contribution in the scientific committee and for research in different areas, fostering scientific research and the development of educational programmes. The great majority of geopark visits are channeled via the UNAM.

4. Relevance of the UNESCO global geopark designation

Obtaining the UGG designation was considered highly relevant for the stakeholders who drove the process. From the standpoint of the UNAM the certification was seen as an opportunity to further enhance the potential of the region as a platform to conduct scientific research. Further, the certification was also seen as an opportunity to leverage the unique geological, cultural, and historical heritage, in order to promote economic development, mainly via the development of scientific tourism. As previously explained, this particular region of Mexico hard hit by poverty, economic depression and loss of human capital due to migration. The geopark was of course seen as a potential antidote to some of these conditions.

At the time of its creation, the geopark was also meant to be part of broader efforts supported by the local regional government to create a tourism route focusing on the Dominican heritage (Dominican Route) of the state, which included the impressive Dominican monastery and church located in the heart of the geopark. The regional government invested significantly in the development of a local museum which was meant to showcase the regional cultural heritage and could also feed into the development to the geopark. This project however never materialized and the building was soon abandoned by the regional authorities (it remains until this day vacant).

The relevance of the project is of course illustrated by the high level of buy in displayed by the local communities located within the park. The fact that there is and was such enthusiasm for the project speaks to the fact that local stakeholders considered the project to be a good fit to their needs.

5. UNESCO global geopark designation and revalidation process

As explained by Dr. Palacio, the UGG certification process was challenging yet highly satisfactory. According to him, the two evaluators designated by the programme to conduct the visit and evaluation report were highly experienced and truly sensitive to the local conditions of the Mixteca Alta Geopark. The fact that both spoke Spanish was also considered to be very valuable. This allowed them to apply the evaluation criteria set forth by the UGGp, while ensure that these were adapted to the local conditions of this territory. This included the fact that financial resources did not abound for the development of the geopark. To a certain extent, the fact that the geopark had managed to do so much with so little, illustrated its merit to become a UGGp.

The evaluation visit has also been described as highly satisfactory. Based on the account of Dr. Palacio, but also of the evaluators as described in the evaluation report, there was a widespread showing of support on behalf of the local population during the visit. The evaluators came away with a very good impression of the participation of local communities in the process, as well as of the level of enthusiasm displayed by these communities with regard to the geopark project.

According to Dr. Palacio, one of the main challenges during the process was linked to its duration. The geopark project was submitted in 2015, but validation only came in 2017 given the fact that the programme was acknowledged as an official UNESCO programme in 2015. According to Dr. Palacio, this lengthy process put the community in somewhat of a negative impasse, given that there was no clarity of the result nor of the timing of the result expected.

According to Dr. Palacio, there is a firm will and expectation that the geopark will seek revalidation. The UNAM is once again strongly expected to support during this process. The geopark appears to be fully convinced of the importance of being part of the global geopark network, as well as of having the UGGp label with UNESCO backing.

6. Results and impact of the UNESCO global geopark

The Mixteca Alta does not appear to have a formal performance framework or Key Performance Indicators. As a result, no formal quantitative targets or baseline data are available which would allow to quantitatively characterize the results achieved since the time of the geoparks certification.

This said, the interaction and exposure to the geopark enabled by this evaluation did allow the evaluator to identify some important results linked to the UGGp certification. As will be described in the following sections, these are mostly anecdotal and qualitative in nature.

1. Geopark activities and outputs

First and foremost, since its formal creation the geopark is providing a set of services and activities which would be unlikely to exist were it not for the UGGp certification and the process it entailed. These activities appears to be structured around a fairly well defined work programme, which is line with the overall vision of the geopark and the strategy defined by its governance members. Acivities appear also to be strongly influenced by the work and examples carried out by more mature geoparks in other regions of the world.

The main activities of the geopark can be categorized as follows:

- **Hosting of groups of researchers and academics interested in studying the geopark and its geological heritage**. This appears to be one of the main outwards facing activities of the geopark, which has led to an increased visibility of the geopark, an increased understanding of its geological properties, and an increase in the number of visitors visiting the region. It's very important to highlight that the geopark is not officially 'open to the public' and that in order to visit the geopark, it's necessary to arrange the visit through the local team. So far,

visits have been limited to research groups and expeditions, while the number of 'general public' visits is still very low. Not being able to visit the geopark out of one's own initiative does somewhat appear to contradict the geopark spirit, and it has obvious negative implications on the geoparks ability to generate a more steady flow of tourism towards itself. Yet the decision to only host 'contained' tourism through formal approval and organization channels is also explained by the fact that the local communities and authorities wish to remain informed about who is entering the geopark and for what reasons. Regardless of whether this approach is justified or not in light of the geopark's more general ambitions and its current state of maturity1, it's clear that this approach is not sustainable in the medium-to-long term and that further efforts should be carried out to ensure the geopark is in a position to receive a wider number of visitors from different sources

- **Hosting scientific activities and research projects,** mainly through the team of UNAM investigators supporting the geopark's scientific council. The creation of the geopark appears to have facilitated the development of a scientific research platform which has allowed to conduct more research in the area, leading to the production of wider knowledge on it (see outcomes in the next section). A special research unit of the UNAM has been established in the neighboring city of Oaxaca which is very active in conducting research in the geopark. A number of recent publications and master's and PhD dissertations have been carried out with a specific focus on the geopark.

- **Development of a series of geotrails allowing to present and visit the geoparks' most valuable geosites.** There is currently a total of 8 geotrails which have been developed based on the inventory of geosites of the park. Only a limited number of geotrails can be done in full autonomy, most of the trails must be visited with skilled and trained local guides. Maps of geotrails have been developed, along with information panels which are on display when reaching the geosites. Special vehicles (i.e. 4x4 are needed to reach many of the geoparks most important geosites).

- **Training of a team of local guides, able to carry out guided visit.** The geopark has trained a number of guides who are now able to carry out guided visits of groups hosted by the park. It is worth noting that the majority of these guides did not have any previous training in geology or in the geoscience. The tips guides receive as the part of the work they carry out represent a limited yet valuable source of additional income for them.

- **Organization and delivery of educational activities.** These are mainly targeted at local schools and universities. The Mixteca Alta's educational programme is strongly inspired by the worked carried out Villuercas (Spain), with whom the geopark has signed a collaboration agreement. Professors and students belonging to the Scientific Committee of the Geopark are responsible for the educational activities, and are supported by the local guides. Many of the educational activities are carried out in collaboration with a local Communitarian Museum "Rastros y Rostros" located in the city of Yanhuitlan, which is at the heart of the geopark.

- **The geopark hosts a range of local activities which are organized in collaboration other local associations or groups.** For instance, the geopark will host a running race which is open to the general public.

- The geopark's activities are showcased in a Facebook page which is regularly updated and appears to be very active. This facebook page works as the de-facto main source of information on the geopark's activities and work. The geopark's website is on the other hand very limited in its content, and provides little information on how the park can be visited and the activities that it carries out.

2. Geopark outcomes and impacts

Given its very recent creation the Mixteca Alta Geopark has not yet conducted any studies on the broader impact generated though the UGGp certification. Most of what will be described in the following sections is based on the appreciation of the evaluator in charge of conducting this case study.

The main achievement of the Geopark appears to be at the human and community level. Indeed, the certification process appears to have injected a true sense of pride and interest in the territory on behalf of its inhabitants and communities, which are indigenous in nature. For some members of these communities (i.e. the guides who have been trained by the geopark), the project has provided a source of additional income, as well as a possibility to learn and grow on a professional and personal level. For the local leaders of the communities in the geopark, the project has also acted as a platform for dialogue,

leading to the development of a common vision for development. According to the representatives interviewed as part to the visit, the geopark label has helped them in their efforts to tap into other sources of financing or support. The geopark label is said to put the territory 'on the map' and increased the legitimacy of their development project. Through the educational activities it carried out, the geopark appears to be significantly improving the level of understanding of its inhabitants of their environment, how to protect it, and its uniqueness. These results in and of themselves, are quite a remarkable for a territory facing the challenges and constraints the Mixteca Alta does.

The economic spillovers of the geopark are still extremely limited, and are not likely to increase until further investments in infrastructure are carried out, and the geopark becomes more open to the world and general public. Currently, it's very difficult for anybody to understand how and whether the geopark can be visited, the supply of accommodation and meals is very limited, and access to the geo-trails is extremely complicated. This said, the creation of the geopark has slowly increased the number of visitors to the region (mostly scientists), which is said to have a had a positive economic impact (on hotels and local restaurants for instance). One of the sectors which appears to have benefit from this is the group of local pottery makers, mostly made up of women. The capacity to generate further economic spillovers for the region remains one of the main challenges for the geopark. This said, in a region that previously used to receive a very limited number of visitors prior to the creation of the geopark, any increase is considered to be significant.

The creation of the geopark has undoubtedly increased the amount of knowledge available on the geological characteristics and heritage of the area. Given the focus of the geopark on the interaction between nature and human settlements, the multidisciplinary dimension of this research is important. As a result, it is safe to say that the creation of the geopark has led to higher levels of understanding of the geological heritage of the region both at the level of the scientific community, but also at the level of the local communities of geopark inhabitants. Mechanisms such as the training of local guides on behalf of the researcher community involved in the geopark, or the educational activities carried out in schools have enabled trickle-down effects from research to the general population regarding the geological characteristics of the region. This was very clear to see when speaking to the local guides who accompanied the evaluator during the case study visit. This has been mostly been driven by the sustained investment and presence of the team of UNAM investigators in the region. The creation of a special research unit in the neighboring city of Oaxaca which regularly works on and in the geopark illustrates this, and also represents a good example of decentralization of research capacities from the capital city to other regions.

The impact of the geopark creation on gender also appears to be important. Direct effects are displayed at two three levels. First and foremost, the group of guides trained by the geopark is fully gender balanced. Second, the direct economic impact of the geopark appear to be benefiting women owned businesses, such as the two main hotels of the city, the restaurants, as well as the group of women producing the local pottery that is sold in the geopark. Third, the staff of the geopark is currently composed of two women.

These benefits have been in for the most part enabled by the motivation to obtain the geopark certification and the related work that has accompanied it. Information sharing and collaboration with other geoparks and actors of the global geopark network have played an important role in this process. And naturally the role of UNESCO as a promoter of geoscience for sustainable development is widely acknowledged by actors who are in direct contact with the geopark.

There does not appear any impact on policy making or disaster risk reduction.

7. Sustainability

There appears to be a clear sense of ownership of the geopark project on behalf of both the local communities, leaders and supporting institutions such as the UNAM. Regional authorities (i.e. the State of Oaxaca or the national government) do not appear to be involved in the project. This however does not seem to pose a direct threat to the level of ownership or institutional stability of the geopark, given the very strong level of involvement on behalf of the local communities and authorities.

Despite the very important results achieved by the geopark thus far, the overall project remains fairly fragile and vulnerable to a number of threats and limitations. First and foremost, the financial sustainability of the geopark is all but ensured. The geopark is not generating any revenues on its own, and is not receiving any type of financial support from any local authorities or international donors. All financial support (including the payment of the GGN fees and the LAC geopark network fees) is provided by the UNAM. This has obvious direct implication on the park's ability to further develop its infrastructure to attract a higher volume of visitors, as well as to deliver a wider range of activities thorough a team of paid personnel. There is a clear need for the park to define a business plan and model, which is adapted to its reality and specificities, as well as the constraints and

limitations it faces. Financial sustainability of the geopark appears to be a key bottleneck to further development.

In addition, while the level fo buy in and participation on behalf of local communities and stakeholdres and communities appears to be very high, the geopark is still very much dependent on the support, leadership and technical capabilities provided by the UNAM and its team of researchers. It's clear that were the UNAM to withdraw from the project (which does not appear to be the case, far from that) the project would likely crumble. As such, there appears to be a need to gradually reduce reliance on the UNAM and build local capacities to manage and run the geopark. This of course is easier said than done, particularly in a region which seriously lacks human and institutional capacities to manage a project such as this one.

8. Conclusions and key lessons drawn

The Mixteca Alta Geopark is a clear example of the value generated when applying the geopark concept and approach to a territory which is lagging behind in a number of ways. As opposed to the work being done in other more mature geoparks in Europe for instance, Mixteca Alta illustrates the developmental value of the geopark approach, and the potential benefits it can generate for highly isolated communities and indigenous groups. To this extent, the Mixteca Alta case can serve as a valuable example for the further development of geoparks in similar developing regions, as may be the case in Africa or other regions in Latin America or Asia. The bottom up approach driven by the UNAM to develop the geopark has high potential for replication, and could serve as a good practice example for other actors wishing to support similar processes in other similar contexts. By the same token, it also illustrates the importance of having a strong and financially stable sponsor who is willing to commit to the project on a long-term basis, such as the UNAM.

The creation of the geopark in such a fragile context also implies that some of the challenges traditionally faced by geoparks are catalyzed and multiplied. The financial stability of the geopark clearly represents its Achilles heel, and may act as a significant roadblock for the geopark to stay on the path of development and growth now that it has been launched. The geopark is likely to require additional support from the UGGp allowing it to overcome these challenges, and ensure it reaches its next stage of development.

A.7 Case study of the Villuercas Ibores Jara UNESCO Global Geopark in Spain

1. Introduction

The case study is a part of the evaluation of the UNESCO International Geoscience and Geoparks Programme (IGGP) carried out by Technopolis Group on behalf of the UNESCO Internal Oversight Service (IOS). The case study is one of the several data collection methods used within the evaluation together with documentary review, semi-structured interviews and a survey. The purpose of the study is the direct observation of the Villuercas-Ibores-Jara UNESCO Global Geopark with a focus on gathering of evidence of its impact on local communities.

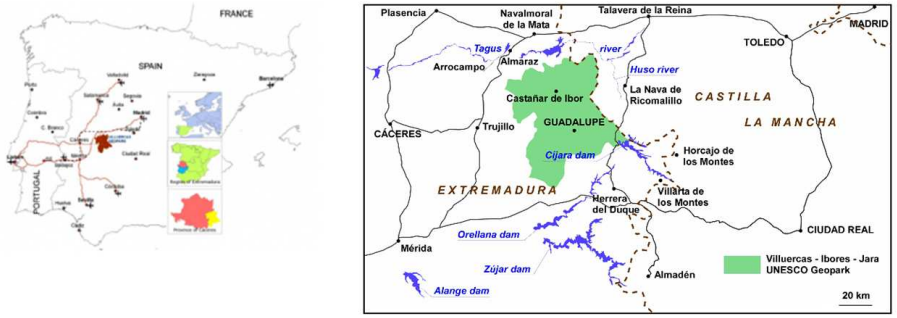
This study is based on a 2.5-day visit to the geopark at the beginning of December 2019, as well as phone interviews with two (former and current) members of the National Commission of Geoparks in Spain. The visit consisted of meetings with the geopark administration, representative of regional authorities, local authorities, representatives of the scientific committee of the geopark, a local school, a family business and representatives of local companies, two local museums, restaurants, as well as the visit in the field of several geosites and a geotrail.

The Villuercas-Ibores-Jara Geopark is one of 13 UNESCO global geoparks in Spain. One of the main reasons for choosing this geopark for a case study is that it follows a successful example of bottom-up management structure. This geopark has also been UNESCO Global Geopark for 8 years and has undergone 2 reevaluations. It is one of UNESCO Global Geoparks that has developed in a notoriously deprived area in western Europe, and that offers an insightful point of comparison with our other two case studies in Mexico and China.

The Villuercas-Ibores-Jara Geopark is a UNESCO accredited geopark since 2011, which has successfully undergone two reaccreditations in 2015 and 2019. The geopark encompasses and area of 2544 km2 with a small population of approximately 15'500. Population density is therefore very low in this geopark (approximately 6/km2). The geopark occurs in a rugged mountainous area (up to 1601 m), which is easily accessible from Madrid by motorway and includes mountain roads of generally good quality. The geopark does not overlap with large protected areas and mostly consist of private land. The area of the geopark is entirely within the territory of Caceres Province that is one of the two provinces within the Autonomous Community of Extremadura. The name of the geopark corresponds to

the Villuercas, Ibores and Jara association of comarcas (mancomunidad) that is the local administrative division. The Extremadura region is one of the most deprived areas in Spain and western Europe, with an employment rate of 19.7% in 2018. A large part of the economic activity in the geopark area is associated with traditional agriculture and pasture. Challenging economic conditions and limited job opportunities have led to continuous rural exodus in the geopark area during the past decade, with a decrease of population of approximately 15% in the past decade.

Figure 1. Location of the Geopark (source: www.geoparquevilluercas.es).



2. Overview of the UNESCO global geopark

Key facts	
Official name	Villuercas Ibores Jara Geopark
Location	Caceres Province, Spain
Surface covered by the geopark	2544 km2
Name of managing structure of the geopark	Council of the Villuercas-Ibores-Jara Geopark
Date of initial designation	2011
Date of subsequent revalidations	2015, 2019

3. Brief presentation of the geopark and key geological significance

The geopark preserves a remarkable example of an Appalachian-style orographic core and morphology. Some of the most prominent geological features of the area reflect a multi-stage tectonic evolution starting with the Hercynian orogeny approximately 350-300 million years ago, with subsequent uplift, deformation and erosion until the active, on-going formation of the Alpine mountain system. This geological evolution has resulted in the formation of a rugged and spectacular landscape that is, notably, of high value for nature-oriented tourism. Nature-oriented tourism also benefits from the large diversity of ecosystems found in the geopark, which hosts bird-watching spots of international renown. Another remarkable feature of the geopark is that it includes world-class paleontological deposits that preserve one of the main events in the evolution of life: the origin and radiation of the earliest animals during the end of the Ediacarian period approximately 550 million years ago. The palaeontological value of the geopark is complemented by a rich assemblage of fossils associated with the Great Ordovician Radiation that led to significant diversification of organisms approximately 450 million years ago. The fossils of the geopark have attracted considerable attention from the international scientific community that studies the apparition and evolution of life. These fossils are also of great interest for the general public and school children interested in the origins of life. In addition to the high tectonic, morphological and paleontological value of the geopark, the geology of the region is also associated with a history of mining that constitutes an interesting historic heritage of touristic and educational interest. The historic value of the geopark region is also complemented by the Royal Monastery of Santa María de Guadalupe that is a UNESCO World Heritage Site since 1993.

4. History of the geopark

The original idea to establish the geopark dates back to 2005, when a fire consumed 12'000 hectares of land in Villuercas and Ibores Comarcas. Together with the Spanish economic crisis in following years, this raised awareness in regional authorities and local communities about the need to better develop a sustainable model of economic development in the region. The project was initiated by the current president of the geopark Mr. José María Barrera as a part-time (50%) contracted activity for the Caceres Council. The first steps of the project benefited from EU financial support through the LEADER funds to help recover from the 2005 fire (LEADER: "Liaisons among actors in the rural economy"). Help has been continuously provided since then by a team of geoscience amateurs and researchers, as well as local political to educational partners. The project of the geopark

was developed with the idea to dynamize local tourism and other activities that could benefit from the natural heritage of the area. The original bottom-up design of the geopark, that has been followed until today, was facilitated administratively by full inclusion of the geopark in the Caceres Province territory. Establishment and original UNESCO accreditation of the geopark benefited from advices from other geoparks managers in Spain, which are part of an active national network of UNESCO geoparks in the country.
Management structure

The geopark is not directly managed by, and under the exclusive remit of, regional authorities. It follows a "bottom-up" management structure with an interaction between several social and political partners. Its management takes place through the interaction of representatives of local communities, companies and the scientific community (Figure 2). These collaborating groups include:

- Government of the Cáceres Province
- General Direction of the Natural Environment (Government of Extremadura)
- General Direction of Tourism (Government of Extremadura)
- General Secretary of Rural Development (Government of Extremadura)
- General Secretary of Education (Government of Extremadura)
- General Direction of Cultural Heritage (Government of Extremadura)
- General Secretary of Rural Development (Government of Extremadura)
- University of Extremadura
- Council of Municipalities (mayors of the Mancomunidad Integral de Villuercas-Ibores-Jara)
- Association of Tourism Companies of the Geopark
- Geological Association of Extremadura (AGEX)
- Local Action Group (APRODERVI) to promote rural development in the geopark.

The overarching goal of the geopark, as well as the role and ethos of contributing institutions or partners, is agreed upon in an Agreement of Collaboration that is signed every 4 years by all contributing institutions or partners. This agreement is transparent and accessible to all through the website of the Geopark. The timing of renewal of the **Agreement of Collaboration** is not determined by the UNESCO reaccreditation process of the geopark, but follows the 4-year duration of a regular political mandate in Spanish politics.

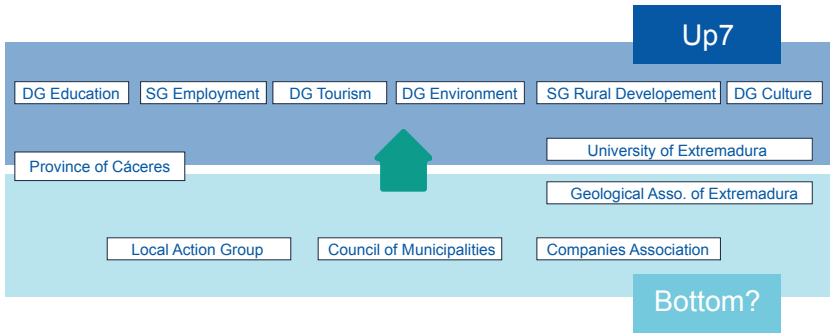


Figure 2. Bottom-up management of the Geopark (source: Geopark administration).

A **Geopark Council** composed of the representatives of the collaborating authorities and local partners (Figure 3) meets once a year to discuss following points:

- The Management Plan
- The Geopark's Action Plan
- The appointment of the geopark's technical structure
- The appointment of the members of the Educational and Scientific Committee
- Establish collaboration agreements to finance projects related to the Action Plan

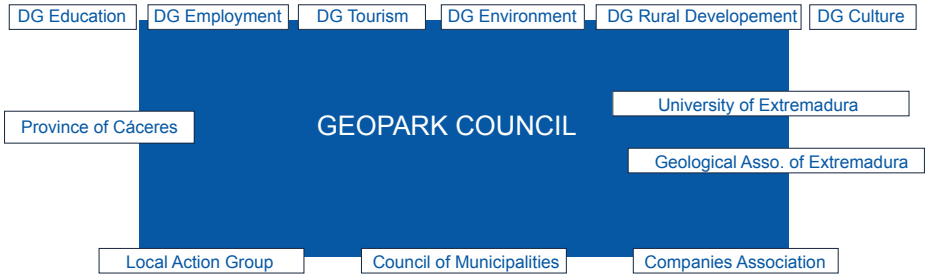


Figure 3. Structure of the Geopark Council (source: Geopark administration).

A **Geopark Steering Committee** (or Geopark Territorial Commission) (Figure 4) meets on a regular basis through the year to manage more practical issues that include:

- Proposal of activities in accordance with the objectives of regional development and geotourism
- Proposal of a draft Action Plan including educational, scientific, geotourism, sustainable development and networking that must be approved by the Geopark Council.
- Monitoring the execution of the programmed activities, guiding them and resolving any doubts about their interpretation.

Figure 4. Structure of the Geopark Steering Committee (source: Geopark administration).

In this structure all partners and contributors of the geopark can suggest the development of new infrastructures and activities that feed into the main objectives of the geopark. The funding of the activities comes from resources of the different political and local contributors as named above (Figure 2), as well as European funds sought after by the Geopark management team when relevant. This means that the geopark benefits from a **large range of resources that organically support infrastructures and activities (e.g., infrastructures, website, education, communication activities,** branding, etc.). The salary of five staff working part- to full-time is covered by funds from the regional government (Province of Cáceres) as well as local councils and companies through the Local Action Group APRODERVI. APRODERVI was founded in 1996 as a **non-profit organization to promote rural development** in the Villuercas-Ibores-Jara area through collaborative actions of local communities and companies. As such, its role, combined with other support from all geopark stakeholders, has likely been significant in the establishment and maintenance of the bottom-up management structure of the geopark.

Relevance of the UNESCO global geopark designation

As also explained in the introduction, the motivation to develop the geopark emerged during a period of crisis following the 2005 fire that severely impacted economic activities in the Villuercas-Ibores-Jara area. Interestingly, the idea of the geopark evolved first without the objective of acquiring the UGG accreditation. The main ethos that has guided the Geopark activities from the beginning is to promote the value of the natural and cultural heritage of its territory following sustainable development principles. The UGG designation was therefore an important recognition for the work achieved by the geopark management and local communities. The designation is highly coherent with regional strategies and is regarded by the management team and local communities as a guarantee of the quality of the geopark and associated philosophy of sustainable development.

5. UNESCO global geopark designation and revalidation process

The idea to develop the geopark emerged following the 2005 fire in Villuercas-Ibores-Jara that incentivized local communities and political actors to find sustainable solutions to the economic precarity within the territory. Preparatory work for the original designation benefited from staff support from the Caceres Province and Local Action Group APRODERVI. Previous political experience of the initiators of the geopark, and intrinsic support of regional local administrations, allowed the project to mature with positive support from regional political institutions. The management of the territory has been greatly facilitated by its full inclusion in the Villuercas-Ibores-Jara administrative remit, which allows efficient political and policy management associated with the development of infrastructures and activities within the geopark. This has certainly played a key, albeit indirect, role in the success of the geopark towards obtaining and revalidating its UGG designation.

As already partly explained above, the UGG designation was not part of the original objectives to initiate a geopark in Villuercas-Ibores-Jara area. However, as the project was maturing to address local needs to foster sustainable development, UGGp was receiving increasing international recognition and several geoparks in Spain were obtaining UGG designation. This led the management of the geopark to consider working towards the accreditation to maximize the visibility of Villuercas-Ibores-Jara Geopark. In this process, the national and European networks of geoparks proved to be instrumental by allowing the exchange of ideas essential to the designation process. In practice, the management

team of the Villuercas-Ibores-Jara Geopark traveled to the Pyrenees to learn from the experience of the Sobrarbe Geoapark and prepare for the UGG designation.

An important, challenging aspect to obtain the UGG designation in Villuercas-Ibores-Jara was to ensure support from local, often fairly remote communities. This required significant communication efforts of the management team to make sure that the meaning and objectives of the geopark would be well understood and received by these communities. This was essential to avoid perception of the geopark project as a threat by rural communities that own most of the territory. Raising the awareness of the communities on the mutually beneficial objectives of the geopark required several years to complete. However, the benefit of this original and continuing communication effort is very obvious today, as notably illustrated by the very positive comments received by a large number of stakeholders during the visit in the field.

The UGG designation and revalidation process were extremely well received by the management of geopark. The designation system, which has continuously evolved during the history of the geopark, is regarded as a very constructive process to facilitate improvements. The evaluation and revalidation procedure is not regarded as a test to achieve designation, but a continuing dialogue with international experts of other geoparks to improve the efficiency, value and outcomes of the geopark. The opportunity for national and international networking within the UGGp is regarded as a very positive aspect of the programme by the geopark managers and stakeholders. This feeling is probably echoing to the relatively remote location of Villuercas-Ibores-Jara, where a sense of isolation might be expected to arise during the development of an ambitious project such as a geopark. Although belonging to the UGGp requires investment of financial and time resources, this cost is considered to be adequate and proportionate to the benefits of the programme by the management staff of the geopark.

6. Results and impact of the UNESCO global geopark

Assessing the results and impact of Villuercas-Ibores-Jara Geopark was challenging because of its bottom-up management system and the nature of most tourism activities in the territory, which do not allow collection of relevant data to feed into a performance matrix or monitoring system applicable at the scale of the geopark. However, based on UGG revalidation documents and the qualitative information collected during the field visit, it clearly appears that the performances of the geopark are excellent and well aligned with the philosophy of the UGGp. It was also clear during the visit that the geopark strongly benefited from the UGGp framework and designation.

7. Geopark activities and outputs

Facilitation of the conservation and research of the geological heritage and fostering the growth of the scientific knowledge. The geopark scientific committee has helped catalogue 50 geosites of scientific value within the territory, which form the backbone of the geopark. Ample documentation is available on these geosites in the form on online resources, maps and display panels in the field. The geopark serves as a natural laboratory for research activities of academic stakeholders such as the University of Extremadura. In most instances, the conservation of the geosites does not require special measures. Appropriate safety standards are ensured during the selection and valorization of the geosites.

Transmission of heritage to society. There is very dynamic communication with the General Direction of Education of the Province of Caceres and with local teachers that has resulted in the inclusion of geopark knowledge and activities in the curriculum of the schools in the region. A Visitor Centre and tourism office are open for most of the week, which offer museum-type information and guidance on the activities available in the geopark. There are many types of activities led by local communities to celebrate the natural and intangible cultural heritage present in the geopark.

Improvement of the creation of local companies for the realization of geotourism activities. Several companies of geotourism have developed since the creation of the geopark. These notably include companies offering multi-lingual guided tours on the geology (and other natural and cultural aspects) of the area, and a museum on a phosphate mine that was active until the beginning of last century. There are also several interpretations centres on specific geopark geological heritage such as sites with spectacular fossils and a unique, recently discovered cave with large aragonitic minerals.

Facilitation of all economic sectors, including agricultural and livestock industry. Significant communication and collaboration with local companies are achieved through the Local Action Group that meets on a regular basis to discuss activities relevant to fostering sustainable economic development in the region. To become member of the association the companies need to pay a small fee per year (of the order of EUR 50). This gives right to display a small glass sign on external walls of the company that show the association to the geopark. Associated companies have the right to use the logo of the geopark on their products.

8. Geopark *outcomes and impacts*

Research and conservation activities within the geopark provide clear international scientific visibility. A measurable outcome of the high geological and scientific value of the geopark is the organization of an international paleontological conference in Villuercas-Ibores-Jara in 2019. This led to the publication of several peer-reviewed scientific papers in English, which are accessible online.

From an economical perspective, the impact of the geopark is more difficult to assess. However, it is clear that a large number (>100) of companies are associated with the geopark through the Local Action Group. As a result, many companies (e.g., restaurants and shops) display the official glass signs of the geopark at their entrance door (which also greatly contribute to local visibility of the geopark). Discussions with different owners of small, generally family-led businesses reveal that their affiliation to the geopark is regarded very positively. In addition, the geopark is commonly used for branding purpose. For instance, small businesses producing local food products such as cheese, olive oil and cured ham frequently display the logo of the geopark on their products. This is clear indication that local communities consider that the geopark represents well their region and cultural identity. The UGG designation clearly played an important role in this process by providing a quality label that attests for the valuable geological and cultural heritage of the region. Members of the Local Action Group see this label as an integral part of their marketing strategy to create a new investment platform to develop new sustainable economic activities in the region.

Another interesting example of the economic impact of the geopark in Villuercas-Ibores-Jara area is the Museum of Phosphorus of Logrosán. This museum initiated in 2012 and now employs 4 staff and hosts approximately 7500 visits per year. The museum includes a visit in a partly rehabilitated underground mine and its associated display centers. Although this setup originally benefited from financial support from the local council, the museum is now entirely self-sustained. Significantly, this museum helps raise the visibility of the geological and cultural heritage of the area because it is located at entrance of the geopark along the main road to the well-known Guadalupe Monastery.

A significant impact that came across very prominently during the field study is that there is very broad identification of the local population to the geopark. The education program implemented in schools probably played a key role in this outcome. Most schools are located in the countryside and can easily access some of the geosites. However, the school visited during the study uses rock gardens, hand specimens of rocks and fossils, pictures of activities in the geopark, etc., to teach a large range of knowledge associated with the geological and cultural heritage within the geopark. This means that the children (and their parents) are increasingly aware of the nature and value of the geopark. The exact impact of this intangible outcome is difficult to evaluate, but this follows the fundamental principle of UNESCO to promote sustainable development through knowledge exchange
Factors of success & challenges to implementation

The bottom-up management structure of the geopark is an important, intrinsic factor of success that was clearly witnessed in this case study. The bottom-up structure greatly facilitates the communication between the management bodies, political authorities and local stakeholders in the Villuercas-Ibores-Jara area. It eases the identification and implementation of the activities to address the strategic objectives by providing allowing efficient communication between the geopark and its local communities. Perhaps the high level of involvement of local communities is facilitated by the challenging economic and societal situation of the area. This setting probably helped the geopark serve as a logical platform to foster and focus collective efforts at the regional scale. A lot of support is coming from stakeholders willing to contribute to this collective effort, which is a clear indication that the geopark is regarded as a very beneficial structure by the local population.

Another important factor of success of the geopark is that its territory follows political boundaries of the area, which makes the management and communication with regional authorities more efficient. This has also helped the geopark to develop activities with continuing financial support from the regional political authorities. These political and financial aspects provide important stability for the management of the geopark (Figure 5).

A third important factor of success of the geopark is that the management and technical staff benefited from advices and guidance from the UGGp. Exchanges of ideas with other geopark managers helped prepare the geopark for UNECO designation. Revalidation procedure, travels of the managers to UGGp meetings and exchange activities with other geoparks in the world have ensured that the geopark has continuously benefited from a large pool of practical experience and recommendation to inspire continuing improvement of practice.

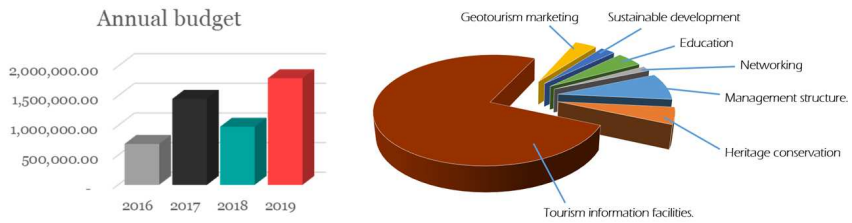


Figure 5. Budget of the geopark, with detail for 2019 (source: Geopark administration).

Among the challenges to implement the geopark, communication to local communities that own the land was probably the most critical. This required years of continuous efforts to raise the general awareness of the local population. Another important challenge has been to clarify to the local population and authorities how the objectives and remit of the geopark would differ from, but complement those of the Guadalupe Monastery UNESCO Heritage Site. Interestingly, these 2 challenges are not related to UGGp procedure but local constraints. The UGGp procedure was considered very effective and supportive, although albeit (positively) demanding by the geopark management.

9. Partnership and cooperation

The geopark is actively involved in collaborating with several partners around the world, in particular Latin America, where staff of the geopark has travelled on a regular basis to contribute to capacitation and advising for the development of new UNESCO Global Geoparks. This is an important international contribution of the geopark towards the education and cooperation objectives of UGGp. In addition, the geopark contributes to the collaborative project "I am a Geoparker!". This project organizes an international club of young people that define themselves as "geoparkers: the storytellers of the history of the Earth". The project wants to be operative in all the global geoparks that promote educative activities as an important work area in their territories. The project welcomes other UNESCO Global Geoparks that want to become partners. This cooperation is another example of the significant efforts of the geopark to communicate the value of the geological, natural, and cultural heritage to new generations. Another example of partnership is the recent exchange of school students between Villuercas-Ibores-Jara and Lesbos Island in Greece.

10. Conclusions and key lessons drawn

The Villuercas-Ibores-Jara Geopark is an excellent example of the benefits created by an UGG initiative in a relatively remote area that has suffered from challenging economic and demographic dynamics. An important lesson provided by the history of this geopark is that the bottom-up approach fosters efficient communication and collaboration between the population, local businesses and political authorities. This type of collaboration dynamics is highly beneficial for knowledge sharing and the creation of local synergies. Importantly, this collaboration dynamics has helped establish a feeling of cultural identification in local communities and a large range of stakeholders. The result is a social and economic environment in which the geopark plays a central role in federating ideas and fostering investments beneficial to the collectivity.

The geopark has also played a significant role in rejuvenating the understanding of the shared natural and cultural heritage in local communities. The geopark is much more than just a concept of preserving and utilizing the value of the territory - it is a common identity for local communities. Education initiatives within the geopark have helped revitalize the perception of an important intangible heritage that was threatened by economic difficulties and rural exodus. The geopark is obviously a significant vector of motivation for the local population, which has also most likely contributed to the well-being of people by providing them with a new common identity and, possibly, purpose.

Participation in the UGGp and the UGG designation has very positively contributed to the development of the geopark and helped improve its visibility regionally and internationally. Critically, the programme has offered many opportunities for exchanging experience with other geopark experts from around the world. The programme has also fostered self-reflection and constructive criticism through the UNESCO accreditation and reevaluation process. The prestige associated with the UNESCO accreditation has helped maximize the impact of the geopark – this accreditation is highly regarded by local authorities and stakeholders. It is clearly seen as a guarantee of the overall quality of the geopark and its associated natural and cultural heritage. Finally, the UGGp designation probably help federate the contribution of a large range of political, social and economic stakeholders in the Villuercas-Ibores-Jara area.

IGCP Case Studies

A.8. IGCP-640 (S4SLIDE)

Project details	
UNESCO IGCP ID no.	IGCP-640 (S4SLIDE)
Project title	Assessing Geohazards, Environmental Implications and Economic Significance of Submarine Landslides across the World's Continental Margins (S4LIDE)
Start and end dates	2015-2020 (from official webpage)
IGCP theme	Earth Resources, Geohazards, Global changer, (Hydrogeology, Geodynamics)
Project leaders parpicipants (name, organization of each one)	Project leaders: Dr. Lorena Moscardelli, Statoil RDI & University of Texas, Austin, Texas, USA Dr. Aaron Micallef, University of Malta, Malta Dr. Michael Strasser, ETH Zurich, Switzerland Dr. Jason Chaytor, United State Geological Survey, USA Dr. Joshu Mountjoy, National Institute of Water and Atmospheric Research, Wellington, New Zealand Dr. David Mosher, University of New Hampshire, Durham, Canada Dr. Maarten Vanneste, Norwegian Geotechnical Institute, Oslo, Norway Dr. Sebastian Krastel, Institute of Geosciences at Kiel University, Germany Dr. Claudio Lo Iacono, National Oceanography Centre, Southampton, UK Dr. Yasushiro Yamada, Japan Agency for Marine-Earth Science and Technology, Japan Associate leaders: Dr. Aggeliki Georgiopoulou, School of Earth Science, Dublin, Ireland Dr. Michael Clare, National Oceanographic Centre, UK Participants: See below 'Input - who involved in the project'
Value of total UNESCO funding	$38,500 (to date) (in order of US$8K per year)

Brief abstract of project	The IGCP-640 project builds upon the extremely successful IGCP-585 (E-MARSHAL) and IGCP-511 known as the Submarine Mass Movements and Their Consequences project. It is concerned with the study of subaqueous mass movements and their consequences in coastal areas, continental margins, fjords and lacustrine environments around the world. As with its predecessors, the IGCP-640 project has been focusing on facilitating the interaction of scientists, engineers, public and private sectors, and others interested in subaqueous mass movements and their geohazard potential, especially those from historically under-represented countries. This project is part of an initiative by the International Geoscience Program (IGCP) and UNESCO. Submarine landslides create a threat to coastal communities and offshore infrastructure. In spite of important contributions by the geoscience community, luck of understanding of some of the complex issues can only be addressed via a multidisciplinary approach. Hence, this project has been seeking to create an international and multidisciplinary platform allowing geoscientists from academia and industry to sustain a dialogue conducive to the integration of findings from different fields into a more cohesive understanding of submarine landslides.
Project objectives	There are many fundamental scientific questions listed in the S4SLIDE IGCP-640 project proposal related to submarine landslides and slope instability that need to be addressed. To answer these questions the project aimed at 1) Strengthening cooperation with International programs, public and private sectors to create awareness, 2) Promoting scientific results to researchers and the general public, especially into reaching out to developing countries and researchers working in highly sensitive regions, 3) Providing platform for the members to access funds to the study of submarine landslides, 4) Promoting events that enhance the exchange of results and scientific ideas associated with submarine landslides, especially focusing on inclusion of young researchers, 5) Influencing the agenda and research objectives of scientific proposals of significant value related to submarine landslides and slope instability to be funded. Furthermore, in 2019-2020 the project is aiming to develop an online, interactive web platform to host growing community database as well as promote collection of standardized, quantitative data for subaqueous landslide deposits that can be toolset as a bridge to better data collection practices, modeling efforts, and collaborations not only within the subaqueous, but also with the subaerial landslide community.

Who was interviewed for the case study	Dr. Lorena Moscardelli, The University of Texas, USA, Project Leader Dr. David C. Mosher, University of New Hampshire, Canada, Project co-Leader Dr. Michael Clare, National Oceanographic Centre, UK, Associate Leader Dr Amando Lasabuda, The Arctic University of Norway, UNESCO-IGCP grantee

CASE STUDY

Origin of the project

Who instigated the project:

IGCP-640 was "instigated" by its predecessors IGCP-511 and IGCP-585 on which the initiative was built upon. Key individuals for these initial efforts were Drs. Jaques Locat (Canada), Roger Urgeles (Spain), David Mosher (Canada) and Marteen Vanneste (Norway), among others. IGCP-640 project continues focusing on facilitating the interaction of scientists, engineers, private and public sectors representatives interested in subaqueous landslides and their geohazard potential. Regarding involvement by geoscientists from the global South and female geoscientists, the IGCP-640 project leader who is from the global South and a female, presently working at the University of Texas, led the effort to develop the IGCP-640 S4SLIDE proposal.

Why the project is needed:

Landslides that occur in subaqueous settings, are societally, economically and ecologically significant, affect coastal communities and offshore infrastructure. Tsunamis generated by subaqueous landslides threaten many coastal communities and have caused large numbers of fatalities. The project is vital to address the need of understanding of the causal mechanisms and timing of subaqueous landslides to advance prediction capability, which is essential to implement appropriate mitigation measures.

E.g., Michael Clair stressed the need for applied research to understand the threat posed to the UK's critical seafloor infrastructure by subsea landslides as UK is dependent upon seafloor cabled networks for telecommunications.

Why UNESCO-IGCP was selected as a suitable support program:

The past projects IGCP-511 and IGCP-585 were best practices where the UNESCO's and IUGS' IGCP label have been instrumental in promoting and obtaining funding to perform research related to this topic. An international and interdisciplinary approach found to be essential to improve understanding and prediction of geohazard from submarine landslides. IGCP is one of the few initiatives that may give such an international umbrella, allow international collaboration and the project to attract diverse group of research fellows from Global North and South.

How the consortium came about and members were chosen:

The consortium dates back several decades to major European and Canadian initiates to study slope stability issues along continental margins. These programs were known as COSTA (COntinental Slope sTAbilty) and CAN-COSTA. Participants realized the value of continued international efforts concerning submarine slope stability. Membership is entirely open to all interested parties.

How were project leaders selected:

Selection of project leaders is through progressive involvement as student, early career professional and then more experienced individual with recognizable interest to become a leader that has worked well. There are also a number of co-leaders in different institutions around the world and even though the level of involvement varies depending on a given year or project agenda, this format allows us to share the weight of the work.

How much influence the UNESCO-IGCP rules/guidance had on project design and selection of partners

The principal influence is encouragement for the engagement of representatives from developing countries.

How project aligned with UN (SDGS, Sendai, Paris), UNESCO/IGCP goals, national and other funder goals:

This project is well aligned with a number of the UN Sustainable Development Goals. For example the project is aligned with the four priorities for action of the Sendai Framework for Disaster Risk Reduction 2015 – 2030, especially understanding disaster risk and enhancing disaster preparedness for effective response. UNESCO focuses its activities in reducing mortality, affected people, economic loss and damage to critical infrastructure, as well as to increase international cooperation and availability and access to multi-hazard early warning systems and disaster risk information and assessment.

Relevant national context for the participants:
According to Michael Clare, from a UK perspective this project is well aligned with a need to better understand the threat posed to the UK from large submarine landslides that could trigger damaging tsunamis. Research by UK members of the project and ongoing collaborators is being used by the UK cabinet Office to understand the risk posed to coastal communities and also to critical seafloor infrastructure. Discussions are ongoing as to how to deal with such hazards in the UK National Risk Register. Michael represents NOC on the Natural Hazards Partnership – the steering group to the UK Cabinet Office, provides that link between this project and UK policy.

Inputs

Who was involved in the project:
Collaboration/participation is truly international. There have been multitude of roles by leaders and members of the community that would be impossible to list individually but in general:

A list of project co-leaders is available in the webpage: https://sites.google.com/a/utexas.edu/s4slide/project-chairs

Community members collaborated via proposal writing:

https://www.esipfed.org/wp-content/uploads/2019/08/S4Slide-ESIP-Lab-Incubator-Proposal-2019.pdf

Authors and editors who are members of the community contributed by publishing, reviewing and editing S4SLIDE articles and special volumes: https://sites.google.com/a/utexas.edu/s4slide/publications

Members of organizing committees in charge to organize bi-annual events, with the next one in Dublin: https://www.slidesdublin2020.com

Session co-chairs, list of past and future events: https://sites.google.com/a/utexas.edu/s4slide/recent-events

Input in terms of funding:
There are two levels of funding: 1) Secured by individual researchers to perform their own research (in the order of millions of US$) from a multitude of sources, 2) The UNESCO/IGCP-640 annual funding in the order of about US$8K each year. This money is reserved to foster networking events, often times used as seed money or grant support for students and early career researchers. It is also used to ensure dissemination of research results.

Influence that UNESCO IGCP funding had on the ability to gain other funding for the project:
The UNESCO/IGCP money that is used to promote networking activities encourages communication among researchers which in turns encourages collaboration to define research lines and grant proposals.

Where is the non-UNESCO-IGCP funding came from:
All these research endeavors received funding from a multitude of sources. A few sources are: IODP, USGS, Geological Survey of Canada, EU, NERC, Commonwealth Office, Royal Society, Private industry (aka. oil and gas, telecom, Fugro and many others) and other research institutions and universities. In addition to UNESCO-IGCP funding, small funds raised from conference proceedings to support students participating the programs. For further examples, please refer the interview response of Dr. Michael Clare, attached to this report.

What the UNESCO/IGCP funding was used for:

UNESCO/IGCP funding has been used to encourage networking and participation of students and early career researchers for: 1) Organization and attendance to the bi-annual S4SLIDE symposium (including field trips and short courses), 2) Workshops, and 3) S4SLIDE special sessions as part of international geoscience meetings such as (AGU, EGU, GSA, AAPG, etc.). The grant helped to cover expenses associated with the conferences, several research results are published that could not have been published if not for this project and acknowledged as an IGCP project.

Collaboration _List of countries involved:
Australia, Austria, Brazil, Canada, Colombia, China, Czech Republic, Egypt, France, Germany, Ireland, Israel, India, Indonesia, Italy, Japan, Republic of Korea, Russia, Netherlands, New Zealand, New Caledonia, Nigeria, Norway, Peru, Spain, Switzerland, Taiwan, United Kingdom, United States, Venezuela.

Collaboration _Participation of scientists from developing countries:
Total number of scientists participating are 74 out of which 26 are female. Young scientists (<35 years old) are 35 out of which 11 are female. Number of scientists from developing countries are 29 out of which 9 are female. Due to privacy concerns, it is optional for participants to provide demographic information (Ref. annual report, 2018).

Project's objectives

Project objectives (as stated in the proposal) and provide any relevant additional context and information:
As stated above!

In addition, the 2019-2020 objective is to consolidate subaqueous landslide data ranging from modern to ancient timescales across lacustrine to marine settings into a simple, open-access platform that is interactive, evergreen, and filterable. The end result will be a website where researchers can explore this global database as well as populate the database with new data. Tools allowing, users to manipulate data, researchers and political decision-makers to access the necessary data to assess hazards and model impact scenarios for subaqueous landslide occurrence.

Have the project's objectives changed at any point during the project:
There was no change in objective but there was a natural evolution from an initial focus on submarine landslides to a subaqueous landslide focus that includes lacustrine and coastal events such as those that are initiated sub-aerially and transition into the marine realm. This is important from a geohazard's assessment perspective.

The project is now broader to improve integration with other disciplines/researchers in related environments and with a push to focus on issues affecting developing countries, as earlier iterations have been more geographically focused on specific regions. The project has a much more global outlook.

Activities and outputs

Key outputs:
Most of the data that is generated by the group comes in the form of technical peer-reviewed publications in a variety of books, special volumes and scientific journals (Springer and Geological Society of London Special Publications/ Volumes). This guarantees that the science generated by project participants is preserved, searchable and accessible for other geoscientists globally and in the future. Bi-annual events that materialize in the publication of special volumes with more than 30 contributions each https://sites.google.com/a/utexas.edu/s4slide/publications

Workshops that are designed to define the most pressing scientific problems and how those issues link with societal needs. In that respect two key outputs that are interlinked:

1. Community consensus on how to collect morphometric data for subaqueous landslides Clare et al. (2018) (https://sp.lyellcollection.org/content/477/1/455) (result of 1st workshop, presented and tested a method to enable the consistent measurement of subaqueous landslides. This is new high quality geoscience knowledge of societal relevance towards disaster risk reduction)

2. Ongoing effort to materialize an online open access database and webpage with a catalog of morphometric measurements for subaqueous landslides (https://www.esipfed.org/esiplabupdate) (the result of the 2nd workshop, see the list of "New Class of *ESIP Lab Projects, part of a S4SLIDE initiative) *ESIP is Earth Science Information Partners, created by NASA.

Another significant achievement where IGCP-640 members participated was the successful completion of an international scientific logging and drilling experiment to investigate slow creeping submarine landslide by the Integrated Ocean Discovery Program (IODP).

How the collaboration and the role of UNESCO-IGCP support the output to come about (capability development in the global South/Female)
Operating under the UNESCO-IGCP branding provides coherency to a diverse group of researchers that come from academia, governments and industry. It helps students to attend these forums, to train the next generation of scientists to better understand offshore geohazards and submarine landslides. In addition, many gained skills and knowledge through pre- and post-conferences field trips, short courses and trainings. Capturing the level of involvement of participants from developing countries, it has been commented as challenging since UNESCO/IGCP doesn't seem to have a mechanism to recognize people from developing countries studying/working in North American and/or European institutions as people from the global South. The Project leader (Dr. Lorna

Moscardelli) is a Venezuelan/American female who is constantly connected with the scientific community in the global South. There are long standing active members of IGCP projects like e.g., Dr. Carlos Alberto Vargas from the National University of Columbia. A number of students from the developing countries (mostly studying in the west) were participating in the program, featuring their work and creating international connections through UNESCO-IGCP support.

How the collaboration worked in practice:

Most members of this community have been involved in the activities as organizers or participants. In terms of skill levels, this community congregates most expertise on the topic from student to subject expert. If a question arises about subaqueous landslides, this is the community to look answer from and to work with related challenges.

Outcomes and impacts

Examples of (significant) outcomes/impacts

The project introduced a standardized method of measuring morphometry, and emphasized the importance of accompanying metadata to explain any decisions made in the measurement process. This method of documenting subaqueous landslides is providing substantial benefits to both the research and applied community so that a consistent global landslide database can be developed.

In respect to the benefit to society and science, other main contribution of the project is the fostering of a multicultural and multidisciplinary atmosphere in which participants can interchange ideas and collaborate. Twitter is used as communication tool that continues to grow with 423 followers to date. The webpage is updated regularly and also used for data sharing.

Example of project support enabled outcomes (key features of the UNESCO-IGCP project outcome)

The role of S4SLIDE is to foster an environment of collaboration and knowledge sharing where our members can start conversations conductive to research. This results in several successfully-funded national and international collaboration projects, e.g.,

1. The Drilling Vessel JOIDES Resolution (economic value of several 100,000 USD per day) that drilled the Tuaheni Landslide Complex and many other research vessel expeditions dedicated to study submarine landslides
2. The Geological Survey of Canada and Ocean Networks provided additional funding to cover cost for the 8th ISSMMTC that took place in Canada (20,000 USD)
3. During "2nd Workshop on Subaqueous Landslides and Morphometric Parameters", a grant proposal was written to ESIP and US$8K additional funding was secured.
4. Michael said 'Project funding for our research in this area exceeds £3M and has been catalyzed in part by the collaborations and scientific background provided by this IGCP project'.

Project leader, Dr. Moscardelli suggested to pass a survey to project participants to quantify how much of this networking is responsible for the collaboration leading to successful grant proposals.

Examples of participants advancing their careers (key features of the UNESCO-IGCP project outcome)

S4SLIDE offered about 39 grants as partial financial support to students, post-doctoral fellows and early career scientists with a variety of technical, geographical and cultural backgrounds, to participate in conference/workshop and present their contribution. A number of young researchers found it beneficial in advancing their careers through networking and collaboration.

Dr Amando Lasabuda (UiT The Arctic University of Norway) mentioned that he met a number of senior scientists (e.g. Lorena Moscardelli, Dave Mosher) and early career scientists (e.g. Harya Nugraha, Benjamin Bellwald, Nan Wu, Lara Perez). He further noted examples as an outcome: 'Benjamin and I are now working together convening a marine geology session in a conference next year. Harya and I are sharing ideas on Harya's new manuscript. Lara, Dave and I met again in a workshop for another geoscience topic (IODP drilling).'

Apart from advancing his career, David Mosher is now a commissioner at the UN on the 'Commission on the Limits of the Continental Shelf' elected by 164 State Parties to the UNCLOS treaty. He explained that his involvement in UNESCO-IGCP played a role in his election and it provided proof of international engagement.

Michael Clare similarly appreciated the program as it is important for his own development due to the ability to collaborate and exchange ideas with experts across the globe.

Project outputs being adopted by decision makers:

Project leader, Lorena Moscardelli noted that the open access online database that the project currently working on will be THE resource to consult by scientists working on the issue of anthropogenic impact of subaqueous landslides worldwide (aka. tsunami risk, offshore infrastructure planning, etc.) to assess risk. Governments will, hopefully, take these assessments as input to influence policy. An important component of knowledge that is generated by this community is already been used by the private sector including the energy sector.

According to David Mosher (Co-Leader), a number of coastal States used submarine landslides in their applications for extended continental shelves. French Guinea, e.g., extensively referenced a paper from one of the UNESCO-IGCP volumes that showed submarine landslides off of their margin to substantiate their arguments for an extended continental shelf. This was paramount in allowing them to establish their outer maritime limits. Mosher has published a paper in one of the UNESCO-IGCP volumes that summarizes a number of coastal States that have used submarine landslides in a similar way (e.g. Norway, Ireland, Japan, French Guiana, Uruguay, Indonesia, Nigeria, South Africa).

According to Michael Clare, in conducting the national hazard assessment and designing database, the Geological Survey of Canada was the first to implement the recommendation given by IGCP S4SLIDE funded initiative (classification scheme provided in Clare et al, 2018). The International Cable Protection Committee (global umbrella organization for subsea cables) noted that IGCP S4SLIDE project information is essential for improving subsea cable routes and has been instrumental in the design of one new cable route through the cable-congested Strait of Luzon between Taiwan and the Philippines.

Creation or investment in new geoscience research groups particularly in the Global South

Unfortunately none. However, it is commented that if UNESCO/IGCP wants to get serious on this aspect, particularly regarding the S4SLIDE research line, current levels of investment AND expectations in terms of the quality of the science output will have to be revised. In these settings, based on the project leader experiences as adjunct professor of the Geoscience Department of Central University of Venezuela in Caracas, the priority should be development of human capital and that takes time in the Global South. According to Dr. Moscardelli it is likely that other institutions in Latin America might be better equipped to meet the high scientific expectations of the program during annual reporting and evaluations. Local conditions are very different to the ones that we experience in North American and European institutions.

Formal on-going collaborations between research institutions

None!

Public information (media reports, etc.) the project generated and its impact:

The IODP Expedition 372 "Creeping Gas Hydrate Slides and Hikurangi LWD" featured a public outreach website, including daily reports, blogs, information movies and more. This public information is not directly generated by the IGCP-Project, but as it links to submarine landslide research and as many IGCP Project members have been involved, it is here considered as part of our project public outreach activities, which was frequently accessed by different stakeholders throughout the world.

Key learning points

Project design - content participants, activities

UNESCO/IGCP might need to have a mechanism to recognize people from developing countries that are studying/working in western countries institutions as people from the global South.

Ways to improve project outcomes and impact

When it comes to addressing societal challenges and developing international geoscience research skills in the Global South, the project noted the priority should be development of human capital and that takes time in the Global South.

Despite the requirement and desire for participation of partners from developing countries, UNESCO-IGCP funding is not adequate to support this involvement and it is difficult to find elsewhere. Improvement in this aspect will improve the outcome.

Even though aware of the other UNESCO programs/initiatives, the project hasn't been able to establish lines of communication yet. However, efforts are underway to establish some collaboration with UNESCO's Earth Science & Geohazards Risk Reduction Initiative.

Comments on the role of UENSCO-IGCP funding/ support /endorsement - the balance of pros and cons (if any) of UNESCO-IGCP funding /support/endorsement

The outreach effort is small with most of the activities leaning into the scientific component. Given the limited resources that are available to develop a proper communication platform, there is a need for additional assistance to advance the agenda on this front.

A.9 Case study of the IGCP Project Characterization and sustainable exploitation of geothermal resources

Project details	
UNESCO IGCP ID no.	636
Project title	Characterization and sustainable exploitation of geothermal resources
Start and end dates	2016-2019
IGCP theme	Earth Resources Hydrogeology Young scientist project
Project leaders participants (name, organization of each one)	Daniela Blessent, Ph.D. (IGCP project leader, young scientist) - Universidad de Medellín (UdeM). Medellín, Colombia Jasmin Raymond, geo., Ph.D. (IGCP project co-leader, young scientist) - Institut National de la Recherche Scientifique (INRS-ETE). Quebec, Canada Pascal Goderniaux, Ph.D. (young scientist) - University of Mons. Mons, Belgium Idalia Jacqueline López Sánchez, M.Eng. (scientist) - Universidad de Medellín (UdeM). Medellín, Colombia Chrystel Dezayes (scientist) – BRGM. Orleans, France Paulo Herrera, Ph.D. (scientist)- Universidad de Chile. Santiago de Chile, Chile. Tanguy Le Borgne (experienced scientist as advisor) - Université de Rennes. Rennes, France Michel Malo (experienced scientist as advisor) - Institut National de la Recherche Scientifique (INRS-ETE). Quebec, Canada
Value of total UNESCO funding	$USD 21,500

Brief abstract of project	Geothermal fluids are extracted through deep wells drilled in a geological reservoir, which can be represented by highly heterogeneous volcanic complex, sedimentary basins or deep basement rocks. If the reservoir is not enough permeable for a profitable exploitation of geothermal fluids, it is enhanced through different engineered techniques in order to improve its exploitation. The main objective of this project is to propose suitable methodologies and techniques for the characterization and modeling of fractured geothermal reservoirs, to ensure their sustainable exploitation and, therefore, ensure acceptation of this kind of energy by local communities. This goal will be achieved with experiences from the volcanic complex of the Nevado del Ruiz (Colombia), the St. Lawrence Lowlands sedimentary basins (Québec, Canada), the Carboniferous limestone reservoir in the area of Mons (Belgium), the Soultz site and the Ploemeur fractured rock experimental site (France). Further, a site in Chile will also be considered. Ongoing and planned work conducted at these sites from international researchers teaming together will provide field data for modeling purposes of highly heterogeneous geological structures. This work will provide new insights into the construction of conceptual and numerical models for geothermal reservoirs, using available information from sites in Europe, North and South America
Project objectives	Analyze the conceptual model data for fractured porous rock. Develop numerical models of heat transfer and groundwater flow in porous and fractured media, considering different scales, from local scale (data provided from experimental sites of the H+ network) to regional scale (Nevado del Ruiz in Colombia and limestone reservoir in Belgium). Conduct a survey on geothermal resources exploitation among the general population, students and scientists to provide insights regarding the current fears related to environmental impacts caused by geothermal exploitation (Barbier, 2002) and microseismicity caused by fracking technologies or re-injection of geothermal fluids.
Who was interviewed for the case study	Daniela Blessent, Ph.D. (IGCP project leader, young scientist) - Universidad de Medellín (UdeM). Medellín, Colombia

CASE STUDY

Origin of the project

The project started as a result of the motivation of Daniela Blessent and Idalia Jacqueline López, at Universidad de Medellín (UdeM), in Colombia, and their desire to propose innovative field methodologies and modeling techniques to facilitate the decision process tying to the management of geothermal resources as well as evaluating public awareness and acceptance. The two professors, at Universidad de Medellín, decided to collaborate, tapping into Daniela Blessent's expertise in groundwater flow models, the experience of Jacqueline López, conducting environmental impact assessments and the significance of geothermal as a renewable source of energy.

Since in Colombia the funds for research are limited, they applied to IGCP after founding the call in Pivot, a funding database. They were interested in the IGCP call because of the opportunity to obtain resources for their project and also for the prospect of learning from the participation in UNESCO's programme network.

In Colombia, geothermal energy has not been widely studied but attracts much interest due to the potential for energy generation given the country's location in the ring of fire. On a global level, geothermal power generation is of great interest, as public concerns about energy demand have arisen, given the need to reduce greenhouse gas emissions and the pressure of a growing population that requires more and more energy. Geothermal energy is an appealing alternative for meeting energy needs, since it can contribute to global efforts to reduce carbon emissions by using a reliable energy source that is available worldwide. However, more studies and characterizations are needed, as the exploitation of geothermal energy remains a challenge for geoscientists due to the complexity and unpredictability of the reservoirs. This project aligns well with SDG 7, Affordable and Clean Energy, as its main goal is to propose suitable methodologies and techniques for the characterization and modeling of fractured geothermal reservoirs, to ensure their sustainable exploitation and, therefore, ensure acceptation of this kind of energy by local communities.

A first attempt to conduct the project was done in 2015, when a first proposal was submitted to the IGCP for evaluation. At that point, the consortium was formed only by the researchers from Colombia and Canada and did not get funding, presumably by its limited scope. For the researchers, it was not clear in the Terms of Reference that the proposal must include several countries. Next year, the proposal was adjusted, including feedback from the reviewing panel and resubmitted to finally become selected. The latter proposal expanded the base of researchers, by including scientist from France, Belgium, Chile, Canada and Colombia. The consortium came together thanks to the leadership of Daniela Blessent and previous collaborations among some of the researchers.

The two project co-leaders work in Colombia and Canada, with less than five years after finishing their PhD, therefore the proposal falls in the category of Young Scientist Project. The other members of the consortium range from middle- stage researchers to experienced researchers, all of them working in the field of geothermal energy.

According to the researchers, the application procedure is clear, and they appreciate that the due date is October because is convenient in terms of time, as it does not clash with the academic timetable. For the application, the Proposal was endorsed only from the National Committee of Canada, as Colombia and Chile do not have IGCP National Committees.

Inputs

Financial

The project obtained 21,500 USD from IGCP and ca. 30,000 € from other sources, that covered the costs of field work, materials, equipment and travel expenses. The leader researchers were committed to obtain funding from other sources and were successful to the extent of being benefited with the following grants, all of them obtained thanks to the UNESCO label:

Grant	Amount	Period	Description
ECOS Nord France-Colombia	10,000 Euro/year	2017 -2020	Travel expenses
Internal Funds UdeM	ca. 6300 Euros	2019 - 2020	INRS Project in the VRN area
PCI-ITALIA ITAL170012	-	2017 - 2020	Unraveling the structural control on geothermal reservoirs applying numerical simulations at San Felipe- Los Andes area (Chile) and Neapolitan geothermal district (Italy)
CYTED Network	25,000 Euros	2019	Shallow geothermal energy (Red Iberoamericana de Geotermia Somera – RIGS)

IGCP funds were mainly allocated (90%) to travel expenses for students from developing countries to attend a workshop in France. They covered accommodation, flight tickets, and local transport, benefiting 2 researchers from Colombia, 1 PhD candidate from Chile, 1 PhD student from Belgium, 2 post-doctoral fellows from France and Canada, 1 undergraduate student from France. The remaining 10% was used for administration purposes. Also, the participating institutions are contributing with in-kind resources, mainly in the form of salaries of the leader researchers.

Collaboration

The project consortium started as a collaboration between the INRS-ETE and the UdeM, and was latter strengthened by researchers from France, Belgium and Chile. The institutions cooperating in this project are Universidad de Medellín in Colombia, INRS-ETE (Research Centre on Water, Earth, and the Environment) in Québec, Université de Rennes in France, BRGM (Bureau de recherches géologiques et minières) in France, Université de Mons in Belgium and the Andean Geothermal Center of Excellence at University of Chile, in Chile. The team is composed by eight researchers with complementary expertises, 70% of the team (including students) are young researchers and 50% are from developing countries.

There were previous and ongoing collaborations among some of the researchers, which facilitated the creation of the consortium and the formulation of the proposal, i. e Jasmin Raymond was a visiting researcher at Universidad de Medellín in Colombia, for a workshop on geothermal resources characterization and exploitation and a field trip to the Nevado del Ruiz to conduct a preliminary estimation of the geothermal potential of the volcanic complex. Likewise, Daniela Blessent and Tanguy Le Borgne were both invited by the Colombian Association of Hydrogeologists as speakers to give a course on hydrogeology of porous fractured geological media. T. Le Borgne, was also previously collaborating with Pascal Goderniuaux.

The aim of the project was to understand and conceptualize the geothermal systems by transferring the techniques developed in recent years by the Rennes team, denominated Fibre optic Distributed Temperature Sensing (DTS) to allow further simulations of exploitation scenarios. Therefore, the project proposed to benefit from the French network of experimental sites (H+ hplus.ore.fr), which aims at coupling new instrument development and modeling approaches for assessing flow and transport processes in heterogeneous subsurface environments, such as those encountered in geothermal systems. An important antecedent, is the experience of Daniela Blessent with DTS technique, that she applied to measure water infiltration into waste rocks where she collaborated with researchers from École Polytechnique de Montréal.

A collaborative approach was proposed whereby each scientist shared its experience in the field or with computer modeling on geology and hydrogeology of fractured media for geothermal resources characterization. The expertise were complementary, D. Blessent had been working on numerical modeling of groundwater flow coupled to heat transfer in geological porous media and experimented with the DTS technique; Jasmin Raymond, is a leader in the area of geothermal energy; Pascal Goderniaux had been working for more than 10 years on regional scale modelling of groundwater resources and deep geothermal projects; Idalia Jacqueline López Sanchéz is experienced on the evaluation of environmental impacts and knows very well the geology of Colombia, Chrystel Dezayes is an experienced researcher that manages geothermal research projects concerning geothermal assessment, deep seated fluid circulation and characterization of fractured reservoir; Paulo Herrera is an expert in the numerical simulation of flow and solute and heat transport processes in porous media; Michel Malo is an internationally recognised expert on energy resources associated to sedimentary basins and he has a large experience in structural geology and finally, Tanguy LeBrogne has expertise in the development of innovative field characterization and modelling methods for heterogeneous and fractured hydrogeological systems.

Fieldwork was conducted in the five participant countries by both graduate and undergraduate students supported by the researchers of the project. On the other hand, the analysis of samples will be conducted mainly at the laboratories of INRS-ETE in Canada and the Andean Geothermal Center of Excellence at University of Chile.

Project's objectives

General objective: Propose innovative field methodologies and modeling techniques to facilitate the decision process tying to the management of geothermal resources as well as evaluating public awareness and acceptance, which can further impact the management of these resources.

Specific objectives:

1. improve the collection and processing of field observations that will enhance conceptual models capabilities for fractured geothermal reservoirs;
2. compare new generation of numerical software that best quantify groundwater flow and heat transfer processes defining geothermal resources;
3. evaluate the public perception and level of knowledge about geothermal energy in the countries involved.

Activities and outputs

Field work activities were conducted in the Nevado del Ruiz area (Colombia), Plomeurs (France), in Charlevoix (Québec), and in Madagascar. The real field data acquired was used to do comparisons with analytical and numerical data (Feflow, HydroGeoSphere, OpenGeosys and Comsol Multyphysics). Also, in 2016 a survey was launched to evaluate the public perception and level of knowledge about geothermal energy. The results have been analyzed in 2017 and shared with the scientific community in the European Geothermal Workshop (EGW) in Strasbourg (October 2018). A full journal paper will be produced as part of this exercise.

In terms of research outputs, more than 12 publications derived from this work, 13 conference papers, 5 project meetings/symposia were organized, and 48 students trained. The results in terms of capacity building are notable, considering that 70% of the participants are young scientist and 50% come from developing countries (mainly Colombia and Chile). During the project, 14 undergraduate students from Universidad de Medellin and Universidad de Chile have been involved, 4 master´s students from INRS-ETE and Universidad de Chile and seven PhD students from INRS-ETE, Université de Rennes and Universidad de Chile.

For the students, this project has been a milestone because it gave them the opportunity to participate in an international research project, have access to an international network of researchers in geology, attend events to present their results and publish their work. As an example, at Universidad de Medellín, most of the students involved are undergraduate, and this project was a big step for them to start doing research. Some of them continued master´s studies tapping on the project results and five of them were benefited with the Emerging Leaders in the Americas Program- ELAP scholarship to do a research stay Canada. In addition, two students participating in the project, PhD candidate Matias Taucare from UChile and undergraduate student Estefanía Ramirez were awarded by the GRC. M. Taucare, won the 2nd place prize in the Best Poster Award contest at the EGW and E. Ramírez won the GRC Undergraduate Scholarship and attended the GRC annual meeting in Reno (Nevada) in October 2018.

Another important result has been the creation of research collaborations and networks. Thanks to the IGCP label, UdeM and UChile researchers were contacted by researcher Mar Alcaraz from the Institute of Plains Hydrology in Argentina, to participate in a CYTED Network project, which later was successfully funded. This network may support a new IGCP proposal, which should be submitted next year. The Network has been funded for 4 years, starting in 2019, with 11 R&D groups and 55 researchers from 7 countries (Argentina, Colombia, Chile, Uruguay, Ecuador, Mexico, and Spain).

Also, In Colombia, Universidad de Medellín stablished a solid research collaboration with AGEOCOL (Colombian Geothermal Association) and Central Hidroelectrica de Caldas (Caldas Hydroelectric Central Company).

On the other hand, the Canadian team increased their international collaborations by integrating a new research area, Djibouti, with a graduate student from there.

Outcomes and impacts

One of the biggest outcomes was the appointment of Daniela Blessent as leader of AGEOCOL Antioquia Regional Chapter. The association was created in 2017, as a result of the motivation of a group of researchers aiming to promote the use of geothermal energy in Colombia. It was thanks to a meeting of the project held in 2016, where the relevance of geothermal energy for Colombia was discussed, that the initiative took momentum and result in the creation of the association. The association has members of the government, academia, and industries, and promoted the creation of a discussion panel to delve into topics such as geothermal as the baseload renewable in the Colombia´s energy matrix, the role of communities, funding support and multilateral banking, between others. Moreover, this year, UdeM was the host of the 4th Geothermal National Meeting, an important event with international speakers, workshops, forums, poster session. In addition to that, next year Colombia will be the location of the Latin-American Geothermal Meeting, which evidences the relevance that this topic is gaining.

All these activities have been a good opportunity for visibility of the project and at the country level it gave more relevance to geothermal energy as an alternative renewable energy source.

In general, the project has been very beneficial for the career of the researchers involved, because it helped them to gain more visibility, expand their professional links, publish in peer – reviewed papers and grew their research groups. It contributed largely at capacity building as it trained many young scientists.

Another promising outcome is the paper derived from the survey conducted among the 5 leading countries (Canada, Colombia, Chile, Belgium and France) to get information on public awareness and perception of deep geothermal energy. A pervasive opinion in all

countries is that the reduction of environmental impacts is the first condition that should be accomplished to support a pilot geothermal power plant. Chile, in particular, has the highest level of acceptance in the exploitation of geothermal resources to produce electricity. This opinion might come from the fact that Chileans are more familiar with these resources, also thanks to the Andean Geothermal Center of Excellence (CEGA), which works to generate and improve geothermal knowledge in the country, promoting the sustainable, environmentally friendly and economically competitive development of geothermal energy. In summary, this exercise gives an overview of what people think and what they know about exploitation of geothermal resources and it represents an interesting analysis that should be taken into account by decision-makers. Scientists can help building bridges between communities, promoters and decision makers, helping to increase the level of knowledge four all stake holders to take sound decisions.

This IGCP project has really helped to position the research team and it will surely continue in the future, since each year there are important outcomes and the research team continue growing, especially in Colombia, Canada, and Belgium, where young researchers leading this project are supervising several students and applying for new grants. The team submitted a second proposal recently to IGCP in order to follow up the advances achieved so far.

Key learning points

The application process was very valuable for the project leaders, in terms of learning, as it helped them to understand the factors that are important for an international project, to give importance to the social gains derived from the project, to assess the impact and work towards positioning the project applying different dissemination strategies. In particular, thanks to the feedback they got after the submission of the first proposal, they integrated more countries to the project, which was essential to expand the scope, achieve the proposed outcomes and increase the critical mass of researchers contributing to the discussions.

All the support from IGCP is well valued by the team, it helped them to focus and enhance the overall project.

UNESCO endorsement was key for the researchers to gain visibility and to become valid ambassadors of this topic not only within the academic community but among policy makers and citizens. As an example, in Colombia and Chile, are starting to do small workshops in schools, for kids to learn more about Geothermal Energy.

Another element that was crucial, according to the team of researchers, is that the students have been very engaged and involved along the project, they do not only contribute to the collection of samples and analysis, but take part in the discussions, develop posters and papers and attend the conferences and project meetings. All those activities contributing toward their training.

F. Appendix F. Literature reviewed

- 38 C/14 STATUTES OF THE INTERNATIONAL GEOSCIENCE AND GEOPARKS PROGRAMME (IGGP). October 2015
- Evaluation of the Earth Science Programme of UNESCO. Final Report of the external evaluation committee. March 1997
- Final Evaluation Report External Evaluation of the UNESCO-IUGS International Geological Correlation Programme (IGCP) for the Period 1997-2002. January 2004.
- REPORT ON THE AD-HOC REVIEW OF The International Geoscience Programme (IGCP). January 2013
- Draft. Strengthening UNESCO Global Geoparks. Suggestions by the German National Committee for UNESCO Global Geoparks to foster the transparency and consistency of the Geoparks pillar of the International Geoscience and Geoparks Programme (IGGP).
- International Geosciences Programme Council and Bureau. Rules of procedure. April 2016
- IGCP 2018 annual report
- IGCP 2017 annual report
- Report of the Councils of the International Geoscience and Global Geoparks Programme (2016-2017)
- Report of the Councils of the International Geoscience and Geoparks Programme (2018-2019)
- Report by the Board of the International Geoscience Programme on its activities (2004-2005)
- Report by the Board of the International Geoscience Programme on its activities (2006-2007)
- Report by the Board of the International Geoscience Programme on its activities (2008-2009)
- Report by the Board of the International Geoscience Programme on its activities (2010-2011)
- Report by the Board of the International Geoscience Programme on its activities (2012-2013)
- Report by the Board of the International Geoscience Programme on its activities (2014-2015)

G. Appendix G. IGCP data

Table 5 IGCP funding

	2012	2013	2014	2015	2016	2017	2018
IGCP Annual Budget	$ 205,000	$ 255,000	$ 265,500	$ 152,500	$ 141,802	$ 125,114	$ 149,327
Average seed funding per project	$ 5,900	$ 6,400	$ 6,600	$ 6,800	$ 6,500	$ 5,500	$ 6,800
Number of projects funded	23	22	17	20	22	20	22
Co-sponsoring sources							
UNESCO	$ 50,000	$ 45,000	$ 59,500	$ 72,500	$ 81,802	$ 65,114	$ 29,327
IUGS	$ 70,000	$ 70,000	$ 70,000	$ 60,000	$ 60,000	$ 60,000	$ 60,000
People's Republic of China	$ 11,000	$ 20,000	$ 20,000	$ 20,000	$ 20,000		$ 20,000
JDPC							$ 40,000
SIDA	$ 74,000	$ 20,000	$ 116,000				

Source: IGCP Annual Reports

Table 6 Project / Proposal data

	2012	2013	2014	2015	2016	2017	2018
Number of applications received			5	15	9	15	13
Number of new projects			2	8	7	9	7
Number of participants (project leaders)					161	135	160
Number of countries (country of the Project Leader)				52	38	52	57
Number of member states that submitted proposals	105		108	133	116	110	105
Number of active projects			18	25	26	21	27
Total number of participants			1988	2794	3558	3377	4485
%of participants from developing nations				52	52	47	65
%of participants that are woman			28	29	37	29	32
%of participants that are young scientist (<35 years old)			29.5	31	38	46	56

Source: IGCP Annual Reports

Table 7 IGCP project 2014-2019

	2012	2013	2014	2015	2016	2017	2018
Number of applications received			5	15	9	15	13
Number of new projects			2	8	7	9	7
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Total number of participants			1988	2794	3558	3377	4485
%of participants from developing nations				52	52	47	65
%of participants that are woman			28	29	37	29	32
%of participants that are young scientist (<35 years old)			29,5	31	38	46	56

Source: IGCP Annual Reports

Table 8 IGCP project 2014-2019

N°	Projects	2019 funding	2018 funding	2017 funding	2016 funding	2015 funding	2014 funding	2013 funding	IGCP Theme
589	Development of the Asian Tethyan Realm				8 000	6000	8 000	7 500	Geodynamic
592	Continental Construction in Central Asia				10 000	10000	8 000	7 500	Geodynamic
608	Asia-Pacific Cretaceous Ecosystems			9000	5,000 + 3,000 (Bang-kok)	6000	5500	7 500	Global Change
609	Cretaceous Sea-Level Changes			7500	6 000	4500	5500	10 000	Global Change
610	From the Caspian to Mediterranean: Environmental Change and Human Response during the Quaternary			5500	3 500	4500	5500	3 000	Global Change
618	Paleoclimate information obtained from past-recharged groundwater				8 000	3500	8000	10 000	Hydrogeology
628	The Gondwana Map Project			7500	3 500	3500	3500	5 000	Geodynamic
630	Permian-Triassic Climatic and Environ-mental Extremes and biotic responses		9 000	7500	8000	10000	8000		
632	Continental Crisis of the Jurassic		6500	7500	3500	6000	8000		
636-Y	Characterization and sustainable exploitation of geothermal resources		8000	5500	8000				
637	Heritage stone designation	7 500	6 500	5 500	6 000	6 000			Earth Resources
638	Paleoproterozoic Birimian geology for sustainable development	8 000	4 000	3000	3000				Earth Resources
639	Sea Level Changes from minutes to millenia	8 750	8 000	7 500	8 000				Global Change
640	Significance of Modern and Ancient Submarine Slope and Landslides	8 000	9 000	5 500	8 000	8 000			Geohazards
641	Deformation and fissuring caused by exploitation of subsurface fluids		4000	3000	3000	6000			
643	Water Resources in Wet Tropics of West-Central Africa	7 500	3 500	4 000	8 000	6 000			Hydrogeology
648	Supercontinent Cycles an Global Geodynamics	9 000	8 000	5 500	6 000	10 000			Geodynamic
649	Diamonds and Recycled Mantle	9 000	4 000	5 500	10 000	10 000			Geodynamic
652	Reading Geologic Time	8 750	6 500	5 500					Global Change
653	The onset of the Great Ordovician Biodiversification Event	8 000	6 500	5 500	10 000				Global Change
655	Toarcian Oceanic Anoxic Event	8 000	6 500	5 500					Global Change
659	Seismic Risk Assessement in Africa	7 500	9 000	NA					Geohazards
661	The Critical Zone in Karst Systems	8 000	2 000	2000					Hydrogeology
662	Orogenic architecture and crustal growth from accretion to collision	7 500	6 500	NA					Geodynamic
663	Land subsidence in coastal cities	7 500	4 000	NA					Hydrogeology
665	Sustainable use of black soil critical zone	8 000	0	NA					Earth Resources
667	World Map of the Orogens	7 500	4 000	NA					Geodynamic
668	Equatorial Gondwana history and Early Palaeozoic Evolutionary Dynamics	7 500	9 000	NA					Global Change
672	Himalayan glaciers and risks to local communities	8 000	9 000	NA					Geohazards
675	Sandstone-Type Uranium Deposits	0							Earth Resources
679	Cretaceous Earth Dynamics and Climate in Asia	7 500							Global Change
681	History of Toxic Phytoplankton in Patagonia	5 000							Global Change
682	Mine Tailing Revalorization	7 500							Earth Resources
684	The Water-Energy-Food and Ground-water Sustainability Nexus (WEF-GW Nexus)	10 000							Hydrogeology
685	Geology for Sustainable Developement	9 000							Earth Resources
689	Study the Ali-Sabieh aquifer recharge (Republic of Djibouti)	5 000							Hydrogeology
692	Geoheritage for Geohazard Resilience	7 500							Geohazards

Source: IGCP Secretariat

H. Appendix H. List of those interviewed

IGCP Members

Name	Position	IGCP Bureau	IGCP Council	IGCP Scientific Board	IGCP National Committee	IGCP donor	IGCP Project Leader/ Participant
Brigitte Vlaswinkel	Chairperson of the Council - Head of Research at Oceans of Energy	x	x	x			
Stanley C. Finney	Secretary General of IUGS. Department of Geological Sciences California State University, Long Beach	x					
Carlos Alberto Vargas J.	Leader Geohazards-Professor at Universidad Nacional de Colombia		x	x			x
Patricia Vickers-Rich	Professor at Monash University				x		x
Gezahegn, Yirgu	School of Earth Sciences, Addis Ababa University			x			
Wu Zhenhan	Secretary-General Chinese National Committee for IGCP				x		
Giwon Koh	Jeju Province Development Co. Water Resources Research Team					x	

UGGp members/representatives

Name	Position	UGGp Council	UGGp Bureau	UGGp Regional Networks	UGGp National Committee	Donor	Geopark´s representative
Asrat Asfawossen	Addis Ababa University (School of Earth Sciences)	x					
Chulepin, Helga	Independent Consultant	x					
Lee, Soo Jae	Korea Environment Institute (KEI)	x					
Guy Martini	Chair of the UGGP Bureau. Haute Provence UNESCO Global Geopark	x	x				x
Martina Pásková,	Czech Ministry of Environment	x			x		
Kristin Rangnes,	Gea Norvegica UNESCO Global Geopark	x		x	x		x
Ana Ruíz Conde	Sobrarbe⊠Pirineos UNESCO Global Geopark	x					x
Jianping Zhang	Vice-chair of the UGGP Bureau China University of Geosciences	x	x				
Nikolaos K. Zouros	GGN President. Professor at Aegean University	x					

Jin Xiaochi	Asia Pacific Geoparks Network (APGN)			x			
Carles Canet	LAC Geoparks Network			x			
Godfrey S. Nowlan	Canada National Committee				x		
José Luis Sánchez	Ecuador National Committee				x		x
Mahito Watanabe	Japan National Committee				x		
Kirstin Lemon	UK National Committee				x		
Melanie Border	UK National Committee				x		
John Norman	Canada National Committee				x		
Lutz Moller	Germany National Committee				x		
Maxis Syren	Germany National Committee				x		
Benjamin Van de Wyk	IUGS					x	
Mónica Ruíz Bustos	Spain UGGp National Committee				x		
Chiang Xiao	Xingwen UGGp - China						x
Lu Qinfei	Yandangshan UGGp- China						x
	Lesvos UGGp - Greece						x
	Comarca Minera Hidalgo UGGp- Mexico						x
	Mixteca Alta Oaxaca UGGp- Mexico						x
	Villuercas Ibores Jara						x

UNESCO Staff

Name	Position	IGCP	UGGp	UNESCO Permanent Delegation
Kristof Vandenberghe	Secretary of the International Geoscience and Geoparks Programme (IGGP) - Chief of Section on Earth Sciences and Geo-Hazards Risk Reduction, Natural Sciences Sector	x	x	
Ozlem Adiyaman Lopes	UNESCO Secretariat	x		
Margaret Patzak	Programme officer and member of the UGGp secretariat		x	
Philippe Pypaert	UNESCO Office in Beijing	x	x	
Hans Thulstrup	Senior Program Specialist- UNESCO Jakarta	x	x	
Denise Gorfinkiel	Oficial Nacional de Programa- UNESCO Montevideo	x	x	
Miguel Clusener-Godt	Director, Division of Ecological and Earth Sciences Secretary, Man and Biosphere (MAB) Programme Natural Sciences Sector			
Damiano Giampaoli	Gender focal point	x	x	
Patrick Mc Keever	Previous Chief of Section on Earth Sciences and Geo-Hazards Risk Reduction, Natural Sciences Sector	x		
Matthew Rabagliati	UK Permanent Delegation			x
Yang Shen	China Permanent Delegation			x
Dominique Levasseur	Canada Permanent Delegation			x
Patricio Zambrano Restrepo	Ecuador Permanent Delegation			x
Juan Andrés Perello Rodriguez	Spain Permanent Delegation			x

I. Appendix I. Relevance of geological science to the SDGs

The Geological Society of London presented an analysis of the relevance and contribution of geological science to the SDGs

https://www.geolsoc.org.uk/Geoscientist/Archive/June-2017/Sustainable-futures

(It is an adaption of an analysis conducted by Joel C Gill in: Gill JC (2016) Geology and the Sustainable Development Goals, Episodes, 40(1))

Group Definitions		
Earth Materials, Processes & Management	Understanding of '**Earth Materials, Processes & Management**' is important to one or more targets/means of implementation relating to the given SDG.	Colour
Skills & Practice	Sharing of and/or changes to geological '**Skills and Practice**' is important to one or more targets/means of implementation relating to the given SDG.	Grey

Sustainable Development Goals (SDGs)			Geological Sciences: Earth Materials, Processes & Management: Agrogeology	Climate Change	Energy	Engineering Geology	Geohazards	Geoheritage & Geotourism	Hydrogeology & Contaminant Geology	Minerals & Rock Materials	Skills & Practice: Education#	Capacity Building#	Miscellaneous
	1	No Poverty	End poverty in all its forms everywhere.										
	2	No Hunger	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.										
	3	Good Health	Ensure healthy lives and promote well-being for all at all ages.										
	4	Quality Education	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all.										
	5	Gender Equality	Achieve gender equality and empower all women and girls.										[a]
	6	Clean Water & Sanitation	Ensure availability and sustainable management of water and sanitation for all.										
	7	Clean Energy	Ensure access to affordable, reliable, sustainable, and modern energy for all.										
	8	Good Jobs & Economic Growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.										
	9	Innovation & Infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation.										[b]
	10	Reduced Inequalities	Reduce inequality within and among countries.										[c]
	11	Sustainable Cities & Communities	Make cities and human settlements inclusive, safe, resilient and sustainable.										
	12	Responsible Consumption	Ensure sustainable consumption and production patterns.										[d]
	13	Protect the Planet	Take urgent action to combat climate change and its impacts.										
	14	Life Below Water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development.										[e]
	15	Life on Land	Protect, restore and promote sustainable use of terrestrial ecosystems...*										
	16	Peace & Justice	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.										[f]
	17	Partnerships for the Goals	Strengthen the means of implementation and revitalize the global partnership for sustainable development.										

Notes

SDGs from United Nations (2015a).

* (Abbreviated) Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Education and Capacity Building are important to some degree within every goal.

Miscellaneous

[a] Promoting equality of opportunities to all (including access to geoscience education). Eliminating all forms of violence and discrimination against women and girls in public and private spheres.

[b] Supporting research and development.

[c] Promoting equality of opportunity, and ending discrimination.

[d] Shared responsibility to improve sustainable practice, particularly in the private sector.

[e] Increased international cooperation on marine protection and research.

[f] Transparency of payments and contracts, helping to fight corruption.

www.unesco.org/ios