

# Application guide: Central America and Mexico DMF call for proposals

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## Background

### The research challenge

Solar radiation modification (SRM) is a controversial proposal for reducing some of the impacts of climate change by reflecting away a small fraction of inbound sunlight. Learn more about SRM [here](#). Historically, most SRM research has taken place in the Global North, and most SRM modelling research has focused on its potential impacts on the global climate.

There has been less research into the regional impacts of SRM, particularly in the Global South. How would SRM affect the climate variables that matter most to people's lives and livelihoods, such as extremes of temperature or precipitation, droughts, sea level rise, or impacts on agriculture, biodiversity, or health? These are the kinds of questions that DMF was set up to explore.

## About the Degrees Modelling Fund

The DMF is the first international SRM research fund and the first aimed entirely at developing countries and emerging economies. It was launched in 2018 by the Degrees Initiative (formerly SRMGI), Environmental Defense Fund, and The World Academy of Sciences (TWAS) in an effort to build the capacity of developing countries to evaluate solar radiation management.

[Read more about the Degrees Initiative](#)

The fund provides grants to small research teams in the Global South, allowing them to analyse the impacts that SRM might have in their regions. To date, the DMF has supported over 150 scientists through 26 SRM research projects, including the first projects in South America, the Caribbean, Africa, the Middle East and Southeast Asia.

There are several objectives of the DMF grants:

- to support excellent science on the potential impacts of SRM;
- to build the capacity of developing country scientists to play a greater role in the evaluation and discussion of SRM;
- to expand the conversation around SRM with local stakeholders; and,
- to build South–South and South–North links over SRM research and discussion.

## About this special call for proposals

In this special call for proposals, we invite applications from small research teams based in Central America and Mexico (see Eligibility and Selection below) who would like to understand how SRM could affect their local climate, and how its impacts compare to those of a warmed world.

## Designing your DMF research proposal

Applicants should have clear research proposals for how to model the potential local or regional impacts of SRM. They will need relevant climate impacts modelling expertise, are expected to formulate the scientific questions that their projects will address, and must show that they will use modelling techniques that are appropriate for their projects.

## Focus areas

The Degrees Initiative is not prescriptive about the focus of DMF research projects or the methods used to undertake the research. The research can address any aspect of physical climate change, or any climate impact, such as extreme temperature or rainfall, agriculture, ecosystems, or water resources. The first round of DMF studies explored how SRM could affect, amongst other things:

- Rainfall in West Africa
- Extreme droughts in Cape Town
- Dust storms in the Middle East
- Extremes of temperature and precipitation in Indonesia

## How SRM is modelled

SRM modelling studies simulate a warmed world without SRM and compare it to a world where SRM has been deployed to reduce the warming. In the past, SRM models would just reduce the amount of inbound solar energy to simulate SRM deployment, but more recent model runs have become more sophisticated, and they now simulate aerosol injection at particular latitudes and altitudes. These simulations typically involve the use of a fully coupled global climate model, sometimes alongside other models to study, for instance, how SRM might affect hydrology or crops. Impact studies have typically used downscaling and bias correction to analyse regional effects.

## Datasets that DMF modellers use

DMF teams work with data generated by large climate model runs, such as:

- Geoengineering Model Intercomparison Project ([GeoMIP](#))
- NCAR's Geoengineering Large Ensemble ([GLENS](#))
- [ARISE-SAI](#) (Assessing Responses and Impacts of Solar climate intervention on the Earth system with Stratospheric Aerosol Injection) simulations
- [GAUSS](#) (Geoengineering Assessment across Uncertainty, Scenarios, and Strategies) dataset

## Bias correction and downscaling

Many DMF projects will require bias correction and statistical downscaling (such as projects looking at river runoff or crop impacts). Some will not require downscaling of any kind (such as studies of climate impacts with large-scale drivers like monsoon changes or tropical cyclones). Studies requiring dynamical downscaling are likely to be out of the scope of a DMF grant because of the significant computing resources needed and the high financial costs.

However, where applicants have the technical expertise and computer access required for dynamical downscaling and could complete their research within the time and financial limits, we would welcome the proposal. Whatever research methods are chosen, applications must demonstrate that suitable modelling techniques will be used and that the research team has the required experience and expertise.

## Emissions and SRM deployment scenarios

Choice of emissions and SRM deployment scenarios will not be a major factor in the evaluation of applications, as these are often driven by the data set that is used. For instance, the GLENS model simulates the creation of a stratospheric aerosol cloud to stabilise temperatures at 2020 levels under a very high emission pathway, whereas the GeoMIP G6 scenarios simulate using either insolation reduction or stratospheric aerosols to approximately halve the climate forcing from a business-as-usual scenario.

## Determining your DMF modelling approach

DMF researchers will be able to refine their choice of scenario and data set in consultation with their research collaborators, with the other DMF teams, and during a research planning workshop. For the purposes of the application, it is necessary only to show that a suitable dataset and modelling approach will be used to answer the research question.

To date, there has been little regional analysis of the impacts of SRM and so projects do not necessarily have to be very complex or ambitious to secure DMF funding. A simple project that is well-planned, managed, and executed, could be an excellent contribution.

A list of recommended key publications and background information on SRM science is available on our [resources for applicants page](#).

## What makes a good DMF application?

There has been little or no SRM research in most of the world's countries, and applicants are thus not expected to be SRM experts. Instead, they need to show that they have experience modelling the impacts of climate change, have done appropriate background reading on SRM, and can demonstrate knowledge of the relevant SRM data sets and modelling techniques.

Project proposals need not be extremely complex or ambitious to secure funding. There has been little study of the regional impacts of SRM, and simple studies done well can make a real contribution. That said, ambitious projects that can be executed competently will score well.

Overall, applications will have a good chance of funding if they:

1. Have a clear scientific question, such as: "Compared to [warming scenario], how would different levels of SRM deployment affect crops of maize in Mexico?" Or "Compared to [warming scenario], how would SRM affect rainfall and temperatures in Costa Rica?" Or "Compared to [warming scenario], how could different SRM scenarios affect biodiversity in the Mesoamerican hotspot?" A suitable warming scenario could be something like SSP2-4.5. Please note that these are just examples of possible topics, not recommendations.
2. Are clear about the geographical area they propose to cover. This could be a region or a country, and it is up to applicants to explain why they have chosen the area that they have.
3. Propose a method that is suitable for answering the research question.
4. Have a team that can carry out the research competently. For instance, if a project requires bias correction and/or downscaling, applicants will need to show that their team has the relevant expertise.
5. Demonstrate a good grasp of the basics of SRM.

6. Explain why their proposed research would be of local importance and would help local stakeholders better evaluate SRM.

Capacity-building is also a key objective of the DMF. Teams that have a mix of experienced and early-career scientists, or that include female scientists, will be looked on favourably. Degrees will be looking to support researchers that show promise to become regional leaders in the field of SRM research.

Applicants are welcome to discuss potential research projects with the Degrees Initiative before submission by emailing [grants@degrees.ngo](mailto:grants@degrees.ngo). But please note that we do not have the capacity to review proposals and provide comments on the likelihood of receiving funding—here we are guided by independent peer review after the submission deadline.

## Financial and logistical details for DMF grants

Applicants will be notified about the outcome of their applications in September or October 2023. Pending successful due diligence, projects are expected to start in December 2023 and be completed by the end of January 2026. A research grant will amount to a maximum of USD 75,000.

### Funding for salaries and overheads

As part of each grant, applicants will be able to apply for up to USD 60,000 to support salaries—perhaps covering a small amount of the time of a senior researcher alongside some more junior researchers—and overheads. Capacity-building is a key part of the DMF and applications that fund multiple investigators, especially early career researchers, will be looked on favourably. However, there are no set guidelines for how the salary funds should be allocated, and applicants should explain why they are allocating money as they are.

### Standard contribution

Each DMF research team will also be allocated a standard contribution of USD 15,000 to support additional activities and equipment related to the grant, including:

- Purchase of computer equipment and software where necessary to complete the DMF research activities (up to USD 2,000 per grant);
- Payment of open-access journal publication fees (up to USD 5,000 per grant);
- Participation in relevant international conferences during the grant's lifetime, as well as the participation of up to two scientists in a potential research-planning workshop (up to USD 8,000 per grant overall).

Teams that do not need salary support may also apply for DMF grants of USD 15,000 (plus overheads) to support all these sundry expenses. They would also enjoy all the other benefits of being in the DMF research community, including support from world-leading experts as they do their analysis.

### Value for money

Applicants should consider the level of funding necessary for their project to take place at the required standards of excellence. Value for money might be taken into account to decide between equally good proposals, and smaller funding requests might stand higher chances of funding.

## Grant administration

Grants will be awarded and administered by the Degrees Initiative through an agreement between the Degrees Initiative, the principal investigator, and their institution.

The awarded team will commit to undertaking its DMF research according to the agreement, and the host institution will commit to providing the appropriate resources and facilities necessary for the project. Equipment, software, and literature provided for the project through the DMF will remain the institution's property after completion. Each team will be expected to publish at least one research paper in a respected international journal, and principal investigators must submit a final report at the end of the grant period.

The funds for salaries and overheads will be paid to the awarded institution in arrears pending the receipt of satisfactory progress reports as established in the grant agreement. The funds for the standard contribution will be paid upfront upon signing the grant agreement.

Research projects are due to run for 26 months, provisionally from December 2023 to January 2026.

## Eligibility and selection

Principal investigators should have a PhD and appropriate research experience. They must be citizens of a developing country or emerging economy AND should work at a university or research institution in one of the following eligible countries:

**Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama.**

Please note:

- The Principal Investigator must be employed by the Host Institution where the project will take place. However, other team members can be based at other institutions as long as they fall within the aforementioned eligibility criteria.
- The Degrees Initiative will only consider proposals that can be supported within the limits of applicable sanctions from the United Nations, the United Kingdom, and the United States of America.
- To create a level playing field for applications and to encourage capacity-building in the Global South, Degrees will not consider applications that have established SRM experts from the Global North as team members. Teams will be connected with their research collaborators after DMF grants have been awarded.
- Funding is only available for modelling or analysing physical climate change or any climate impact, such as agriculture, ecosystems or water resources. There will be a separate call for proposals in the future for research in the social sciences.

## Review process

The review of proposals and the allocation of funding will be made according to the following process:

1. **Scientific peer review:** All eligible applications will undergo independent peer review. They will be evaluated against the following criteria:
  1. A well-developed research question and suitable research methods. Does the proposal aim to answer a clearly defined and important scientific question? To what extent is the proposed research designed to return new, interesting or useful knowledge? Will the experimental design answer the research questions posed?
  2. Research team experience and knowledge. Do the applicants have the necessary experience and capacity to carry out the project, and have they demonstrated expertise in the proposed research methods? A history of publication in international peer-reviewed/ISI-indexed journals is an asset.
  3. Project feasibility. Are the proposed time frame and staffing levels likely to produce high-quality research? Does the project have a clear and appropriate management plan, and are the resources requested appropriate and justified?
  4. Benefits to the country and region. Has the application made a strong case for how the research will inform discussions of SRM in their country or region? Is the proposed topic of study locally or regionally important? Will the project help local stakeholders better evaluate SRM? Research projects that explore impacts that affect lives and livelihoods (which could be anything from rainfall to temperatures to agriculture to biodiversity to heatwaves) are likely to score higher than projects that explore, for instance, only the physical processes that underlie climate impacts.
2. **Interview:** The principal investigators of applications that meet or exceed our standards of excellence will then be invited for a short video interview to discuss their proposal further. These interviews are expected to take place online towards the middle of September 2023.
3. **Funding decisions:** A selection committee will make final decisions on the projects that will be funded—pending the successful completion of a due diligence process. The committee’s decisions will be primarily informed by the independent peer review process

## Notification of decision

The selection committee will meet towards the end of September 2023, and notification of the results will be made shortly thereafter upon approval by the trustees of the Degrees Initiative. Applicants shortlisted for a grant will receive a conditional award letter addressed to the principal investigator and the head of their institution and undergo a due diligence process. Shortlisted applicants that meet the due diligence requirements will then be officially awarded upon signing a grant agreement.

## How to apply

- Complete and submit the electronic application form by 31 August 2023 (23:59 British Summer Time). Incomplete applications cannot be considered.

- Each scientist named in an application should provide a copy of their passport or ID card and a CV with their full list of publications.
- A researcher may only submit one application as principal investigator for this call. There are no limits to the number of proposals on which a researcher is listed in other roles.
- Each applicant will receive an automated email to acknowledge receipt of an application. If you do not receive a such acknowledgement within 24 hours, please contact us at [grants@degrees.ngo](mailto:grants@degrees.ngo)