2021:28 | Sida Decentralised Evaluation

FCG Sweden

End of Programme Evaluation of Sida's Support to The World Academy of Science (TWAS), 2017–2021

Final Report

Sida

End of Programme Evaluation of Sida's Support to The World Academy of Science (TWAS), 2017–2021

Final Report
July 2021

Zenda Ofir
Matti Tedre
Mohammed Saqr
Sofia Kliukina

Sida Decentralised Evaluation 2021:28
Sida

Authors: Zenda Ofir, Matti Tedre, Mohammed Saqr, Sofia Kliukina

Sida Decentralised Evaluation 2021:28

Commissioned by Sida, Unit for Research Cooperation

Date of final report: 2021-07-23

Art. no. Sida62426en

urn:nbn:se:sida-62426en

This publication can be downloaded from: http://www.sida.se/publications

SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY

Address: SE-105 25 Stockholm, Sweden. Office: Valhallavägen 199, Stockholm
Telephone: +46 (0)8-698 50 00. Telefax: +46 (0)8-20 88 64
E-mail: info@sida.se. Homepage: http://www.sida.se

Table of contents

Abbreviations and Acronyms

AAAS	American Association for the Advancement of Science
ASM	Academy of Sciences of Malaysia
ASSAf	Academy of Science of South Africa
GIS	GenderInSITE
IAP	InterAcademy Partnership
ICTP	International Centre for Theoretical Physics
ISP	International Science Programme
IFS	International Foundation for Science
ISC	International Science Council
KIIs	Key informant interviews
LDCs	Least developing countries
MEL	Monitoring, evaluation and learning
OECD DAC	OECD Development Assistance Committee
OWSD	Organisation for Women in Science in the Developing World
PIO	Public Information Office
RAG	Red-amber-green (evidence assessment rubric)
RCYS	Regional Conference for Young Scientists
RG	Research Grants
RP	Regional Partners
RQ+	Research Quality Plus
S4D4C	Using Science for/in Diplomacy for Addressing Global Challenges project
SDGs	Sustainable Development Goals
Sida	Swedish International Development Cooperation Agency
SNA	Social and temporal network analysis
STLCs	Science- and technology-lagging countries
ToC	Theory of Change
ToR	Terms of Reference
TWAS	The World Academy of Science
TWAS-AREP	TWAS Arab Regional Partner
TWAS-CASAREP	TWAS Central and South Asia Regional Partner
TWAS-LACREP	TWAS Latin America and the Caribbean Regional Partner
TWAS-SAPREP	TWAS East and South-East Asia and the Pacific Regional Partner
TWAS-SAREP	TWAS Sub-Saharan Africa Regional Partner
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WHO	World Health Organisation

Preface

This evaluation was contracted by Sida's Unit for Research Cooperation through the Sida Framework Agreement for Evaluation Services, and conducted by FCG Sweden.

The Evaluation Team consisted of Zenda Ofir from South Africa (team leader), Matti Tedre from Finland, Mohammed Saqr from Egypt and Sofia Kliukina from Russia, who also represented FCG on the team. The Final Report was quality assured by Kim Forss, whose work was independent of the Evaluation Team. Johanna Lindström provided project management support.

The Evaluation Team wishes to express our appreciation for the valuable time and insights – both positive and critical - that Sida and TWAS representatives as well as programme partners and other stakeholders shared with us.

We are particularly grateful for the positive spirit with which representatives of the TWAS governance system, leadership, senior management and staff assisted the team, and for their commitment to the use of the results.

Executive Summary

The Evaluation

This end-of-term, forward-looking evaluation of Sida's support to The World Academy of Sciences for the period 2017-2021, commissioned by Sida's Unit for Research Cooperation, was conducted by a four person team over a five week period during May - June 2021. It is intended to inform future strategy and programming in TWAS and within the Sida-TWAS partnership. The evaluation was based on a mixed-methods, systems-informed and (partially) use-focused approach that triangulated and combined evidence from a series of sources and methods to arrive at the findings and conclusions in this report.

Overall Assessment

The long-standing, productive partnerships between Sida and TWAS is well reflected in the largely successful execution of this programme. Building upon what has been done over the years - with some new emphases and one new component - much has been achieved in line with what TWAS set out to do, although a number of weaknesses as well as opportunities leaves significant room for caution, improvement and strengthening. If these can be addressed, the current contours of the programme position it well for further, even enhanced support within the TWAS Sixth Strategic Plan 2021-2025. However, a key question remains: TWAS has a privileged position in science in the Global South. To what extent can and should the programme reflect a more robust approach to get to systems change, or even transformative change in order to lead in line with its potential - given need for the world in general, and science in particular, to confront multiple interconnected crises, especially in science and technology lagging (STLCs) or 'least developed'[1] countries (LDCs)?

Relevance

The programme displays good sensitivity to the need for relevant contributions in several different ways, through (i) the crucial importance of basic sciences and basic research for the development of sound science in targeted countries; (ii) the blurring of basic and applied sciences that means many grants show potential for application even if not so focused; (iii) several programme components and related events reflecting important regional, international and/or global issues and trends; (iv) despite a conservative programme in general, some creativity in line with important global dynamics; and (v) good responsiveness by programme designers and implementers to evaluative recommendations as well as lessons learnt through experience. Challenges

[1] We recommend considering the grouping of 'low-income countries' instead, to get rid of the notion that some 'perceived as lesser' countries should follow the development path of others.

include stakeholder confusion about whether the programme supports basic sciences and/or basic research, and contexts within STLCs that are not conducive to supporting some of the main benefits of relevant initiatives, for example capacities in science diplomacy, without strong concerted, collective action – something that TWAS has yet to promote (with success). Most importantly perhaps, through this programme Sida helps ensure that basic science and basic research are supported, which is crucial in STLCs – yet this type of support does not quite ensure the nurturing of scientists in tune with the urgent and severe challenges facing humanity during this time.

Coherence

Significant attention will be needed to strengthen the coherence and potential for synergistic effects in the programme. In the absence of a strategic approach and limited staff time there has been insufficient attention to alignment and synergy despite clear complementarities between programme components, and between TWAS and its often 'once-off' partners in events. The monitoring, evaluation and learning (MEL) system does not encourage coherence, design and reporting are done in silos, and mobility grants and communications are under-used for this purpose. At the same time the scattering of grants based on relatively small amounts have drawbacks such as an insufficient focus on the systemic nature of change, high transaction costs and the challenge of being context-sensitive across many different countries. But the lack of concentration also has useful benefits in the form of in-kind and financial leverage, as well as cost-effective action, especially through Regional Partners and the streamlining of procurement processes.

Efficiency

TWAS in cooperation with partners has done an impressive amount of work to improve efficiency, including its first steps towards a mature MEL system, moving several processes on-line, ensuring standard guidelines for localisation, and streamlining procurement, grants and reporting processes. Yet the agility of UNESCO processes and alignment between TWAS, UNESCO and Sida administration can be improved, and caution is needed to guard against negative consequences such as regional partners who struggle with rigid guidelines and administrative overload that do not allow for creativity and strategic input.

Effectiveness and Impact

Good progress has been made in all components towards the achievement of programme objectives, including in continuing key processes during the pandemic era. But nearly all positive benefits – although many, and solid - remain at the level of the individual rather than systems, and may not have sufficient long-term benefit or in-built sustainability. While focusing on the capabilities and insights of individuals, and especially of young LDC scientists, are a laudable focus and desirable as a sound basis for further action, opportunities for higher level change are being lost. Concerns also include (i) the fact that quantity has by some measures been promoted over quality

(sometimes inadvertently and even contrary to TWAS intentions), including in publication; (ii) that monitoring data do not always allow for the nuance needed to understand in greater depth what is actually taking place; and (iii) that networks following regional events have been slow to take off, yet appear to be essential to sustain important achievements and their benefits. The use of an insufficiently developed programme logframe instead of more informed and detailed theories of change, especially ones that explicitly describe their underlying assumptions about how change happens, and an under-developed MEL system have exacerbated this situation. It is important, however, not to underestimate the value of the many achievements in each of the five components. The capacities of young, especially LDC-based scientists have most certainly been strengthened through qualifications and soft skills capacity development, through exposure to the value of science beyond the academia, and through connections with others in the region and beyond. There are signals that instead of suppressing brain drain, all of these actions might contribute to further increasing mobility rather than retention of scientists in their countries, but this is likely inevitable when institutional and other systems do not co-evolve with the scientists' expertise and exposure. It is not a straightforwardly negative outcome of capacity development.

Gender and Environment

TWAS has in this programme paid serious attention to issues of gender. It is visible in grants review processes, in guidelines and, perhaps to a lesser extent, in events programming. A good gender balance has therefore been achieved in most processes, grant allocations and events. However, areas that need strengthening in this regard exist, in particular in engaging women more frequently in ways (for example during regional events) that can highlight them as role models; in the gender balance among proposal reviewers still needs improvement; and considering the role of gender in the set-up and content of supported research. The programme can therefore be classified as largely gender-specific[2]. It is certainly not gender-transformative, although there are signals of transformative change at individual level where some women scientists working in strongly male-dominated contexts have been given support and profile. In contrast, the programme has been slow and superficial in addressing requests to engage with the environment, while climate has received more attention in themes and topics for events, and in grantees' project topics, primarily as a result of the interests of stakeholders in different regions.

[2] Using the definitions of the WHO Gender Analysis Tools, which is more granular than those of other UN agencies, including UNESCO.

Influences on Progress and Performance

The Evaluation Team identified during its assessments a range of key reasons for positive advances as well as hindrances to progress and achievement. While not proposed as a comprehensive list, they highlight the many aspects that support and strengthen the notion that TWAS has been able to achieve much, yet has not yet explored the full extent of its potential value proposition for these increasingly challenging yet also dynamic times that are full of opportunities for creativity and renewal.

Recommendations

For Sida:

We encourage Sida to continue and even increase support to TWAS, but with higher expectations and increased joint action on more sustainable financing.

For TWAS leadership, management and staff:

1. Provide stronger leadership in efforts to work towards systems change and/or transformation in STLC and LDC countries. 'Connecting the dots' by thinking and working with a systems lens can add significant value to what is done and achieved. Among others this could require strengthening the programme's niche and value by working more purposefully within the ecosystem(s) in which TWAS operates and paying special attention to both positive and negative influences on success; giving authoritative voice to STLC and LDC science through the convening and latent advocacy power of TWAS; develop one or more theories of change for the programme's support to STLCs and LDCs, and connect these to other TWAS programmes; balancing and linking institutional and individual development; seeking (with others) the best leverage points in a system; and energising emerging networks even if young scientists have to receive some payment to help moderate and make them work.

2. Focus on more strategic and sustainable impacts as well as on financial sustainability through longer-term, more strategic partnerships and coalitions.

3. Energise emerging networks to help nurture ripple effects, confidence, connections, and exposure for young scientists, and enable their voice to be heard in international forums and on issues that matter.

4. Strengthen organisational policies and regulations in support of (i) gender, in particular if TWAS aims to become gender-transformative, and (ii) the environment, with particular attention to scientific content and the dire need for strategic leadership in this area of work.

5. Strengthen the programme (and component) change logic (theories of change) and its approach to monitoring and evaluation so that it becomes an empowering instrument

for TWAS rather than a donor requirement – but with due consideration of the implications for staff workload.

6. Be clear and explicit about what TWAS considers 'quality' research in STLCs and LDCs, including with reference to the important matter of 'decolonising' science and hence research, and to considering a refined definition that includes i.a. a stronger focus on positioning research for use in policy and practice. Among others, the adoption of aspects of the RQ+ (Research Quality Plus) Assessment Framework can be useful.

7. Strengthen communications by continuing the synergistic approach that TWAS has adopted, and moving on to exploit the potential its platforms offer. This will require specialisation and additional training.

Alerts

The Evaluation Team also identified a number of 'alerts' - weak signals that did not converge into clear findings and recommendations, and which might require monitoring and further evaluation:

i. The programme's relationship with UNESCO is not uncomplicated, with some unresolved tensions;
ii. Many developments, like enhanced monitoring and evaluation, and the need to for effective communications, appear to increase the already heavy workload of programme staff, and this might require attention in terms of core financing if TWAS is to fulfil its promise in this highly challenging era for science;
An insufficient focus on 'systems' poses a reputational risk where equipment procured by TWAS may be unused (or significantly underused) due to severe deficiencies in the institutions where they are delivered

1 Introduction to the Evaluation

1.1 BACKGROUND AND PURPOSE OF THE EVALUATION

This independent, forward-looking evaluation consists of an assessment of key aspects of the performance and results of Sida's financial support to TWAS for the period 2017-2021. Commissioned by Sida's Unit for Research Cooperation, it was conducted by a four-person team from South Africa, Egypt, Finland and Russia over a five-week period during May-June 2021.

The terms of reference are included in the report as Annex 1. As commissioned, the evaluation provides detailed findings and strategic conclusions as well as lessons and recommendations that we trust will help TWAS to improve its future programming, and enable the submission of an evaluative evidence-informed proposal to Sida for 2022-2025. We structured our findings, conclusions and co-created recommendations to be useful to the primary intended users: Sida's Unit for Research Cooperation, the management teams and financiers of TWAS programmes, and the management teams of the Organisation of Women in Science in the Developing World (OWSD) as close partner of TWAS. We also trust that the report will be useful to secondary users including UNESCO, the general public in Sweden as financiers of Sida's interventions, and the intended beneficiaries of the programme in the Global South who should experience evaluation as an empowering process.

1.2 EVALUATION OBJECT AND SCOPE

The *Building Research Capacity in the Basic Sciences in Developing Countries* programme supported with financing by Sida during 2017-2021 consists of five components (detailed in Annex 2), of which three are aimed at the development of the capacities of promising young individual researchers and established research units. In line with the priority foci of TWAS and Sida, the programme supports science and scientists primarily in the 66 science and technology lagging countries (STLCs) identified by TWAS, which also include all of the 46 least developed countries (LDCs).

The bulk of the programme funding was allocated to the competitive research grants component. The young scientists and research groups supported were therefore an important focus for assessment, but each of the components was given due attention before we drew them all together in our final synthesis assessment. One component was aimed at TWAS as organisation and its reach, namely the support to expand and enhance TWAS communications, but since a programme cannot be analysed in isolation of the organisational context in which it is funded, designed and implemented, several of our analyses referenced Sida and TWAS from this perspective. The Science

in Exile component – previously referred to as Refugee and Displaced Scientists- is still new and evolving; within our time constraints we therefore paid limited attention to its implementation and instead focused our energy in its design and fit within the programme and TWAS mission.

The data in Annexes 2, 3 and 4 provide detail that illuminate the scope – Annex 2 with respect to the nature of the components; Annex 3 with respect to the activities and outputs of the programme, and Annex 4 with respect to the financial commitments over the period under review.

1.3 OVERALL APPROACH

We structured the evaluation in line with our undertaking in the Inception Report. Four main elements characterised our approach:

Focus in line with the terms of reference. Seventeen evaluation questions focused the assessment based on five evaluation criteria - relevance, coherence, effectiveness, efficiency and impact. We refined and detailed these with a proposed set of indicators and sources of information in the evaluation matrix (Annex 5), among others emphasising the importance of identifying influences on progress and success (or failure), as well as success factors, and then relating these to future options for action. Figure 1 highlights the key aspects we had to assess to meet the terms of reference. We treated each of the five programme components as a primary unit of analysis, followed by a synthesis assessment for the programme as a whole.

Figure 1: Areas of focus for the evaluation, per component and for the programme overall

Relevance	Coherence	Effectiveness	Efficiency	Impact
▪ Responsiveness to stakeholder, regional and/or global priorities ▪ Responsiveness to lessons and experience ▪ Component constitution	▪ Complementarity and alignment with other TWAS interventions and programmes ▪ Complementarity and alignment with other interventions in the sector	▪ Achievement of objectives ▪ Differences across groups ▪ Usefulness of the MEL system	▪ Economic delivery ▪ Timely delivery	▪ Positive outcomes ▪ Negative consequences ▪ Gender equality / mainstreaming ▪ Environment

***Influences on progress and success. *Success factors and other lessons. *Options for the future.**

A systems view of intervention and change. We recognised the importance of having a systems view of science support and capacity strengthening interventions in STLCs/LDCs. This meant that we considered not only the institutional, national and international systems within which an individual scientist conducts her work, but also the fact that multiple interconnections and interdependencies from local to global level

require us to engage with the implications of the diversity of contexts and influences on plans, actions, performance and progress towards impact. This includes considering the type of changes that were intended - incremental change, reform or transformation from individual to systems level –the underlying assumptions, whether the expected changes could be catalytic or cumulative over time, showed signs of ripple effects in line with and beyond what TWAS strives to bring about, were likely to sustain, and/or could be moderated or even neutralised by negative consequences.

Positioning the programme within layers of context. We placed the data collection and analyses within the programme context, the mission and relevant strategies of TWAS and Sida, and international developments over the period that could affect science systems in the STLCs / LDCs, including their priority foci and financing. This could not be done to any great depth; we only had time to look at signals that might indicate trends and broad directions. We did this through a very limited, rapid literature scan complemented by several key informant interviews with highly experienced persons from within the TWAS ecosystem and from among those without any direct linkages to TWAS. This information helped us to consider whether the programme components were filling a niche that made Sida's support particularly valuable and/or suited to the demands of an era defined by the Sustainable Development Goals (SDGs), growing income and wellbeing inequalities within and between societies, transformative technologies and multiplying global crises.

Forward-looking yet influenced by the past. Path-dependence is a factor to be considered in programme assessments. We therefore considered how the programme evolved from the previous phase, and even used some prior data to inform certain observations about the impacts of programme actions on individual participants, especially since the research grants component was largely a continuation from previous phases of support. We felt comfortable extrapolating some trends analyses from an earlier phase. An important question for us during the evaluation was whether the very important stability provided by Sida financing, and the slow evolution of the programme over the past two decades, could moderate or prevent the acceptance of suggestions of drastic change in future – given the extraordinary period for science and the world at large in the aftermath of the COVID-19 pandemic.

1.4 METHODOLOGY

We conducted the evaluation in line with the undertakings in the Inception Report – applying a mixed-methods, theory- and systems-informed, (partially) utilisation-focused approach.

The mixed methods approach was reflected in the diversity of methods we used for data collection and triangulation. The theory-informed aspect was based on the retrospective development of a theory of change (ToC) for each component and for the programme as a whole. We derived these from documents and discussions during the inception phase, and used it only within the Evaluation Team; there was no time to embark on a process of validation with TWAS staff, but given how we used the ToCs

– considering in particular the underlying assumptions and notions of impact - we doubt whether this will challenge the credibility of our findings.

As noted in section 1.3, a systems view of the research endeavour and of the role of capacity strengthening initiatives within it also shaped our data collection and analyses. We furthermore treated gender and the environment as cross-cutting issues for exploration. We considered how gender was addressed in programme processes

An utilisation-focused approach could be only partially implemented, as we cautioned in the Inception Report. Elements that were implemented included the input by the evaluation steering group in the beginning that helped to guide the approach and methodology; engagement in data collection of key persons from primary user organisations and other stakeholder groupings in line with our stakeholder map; consultation with senior staff in TWAS to share and help resolve challenges; and the validation workshop intended to consider the draft findings before their finalisation as well as co-creating recommendations for future action. We included the intended beneficiaries in interviews and surveys, but in an extractive manner, and would like to advocate for a more empowering approach in future Sida evaluations, where the evaluation timeframe would not be such a major constraint.

1.5 METHODS AND ANALYSES

Each team member had specific foci within the assignment, working in matrix fashion with particular criteria and components or set of components. Information was shared where this was essential. In order to garner a wide range of perspectives and evidence, and facilitate triangulation between sources and methods, we collected and analysed a range of primary and secondary data. Details about the methods are provided in Annex 6.

Sampling strategy. The sampling approach for each of the methods (table 1) was informed by the stakeholder map in Annex 7.

Reach of the surveys: 170 (80% response rate) and 67 (15% response rate) persons were reached through surveys - respectively conducted among research grantees and those who participated in events organised through the Regional Partners. In both surveys, the percentage of male respondents was greater that the percentage of female respondents - among surveyed grantholders the distribution was 59% male and 32% female (the remaining 9% preferring to self-describe or not state their gender), while for the Regional Partners survey the distribution was 51% male and 36% female (the remaining 13% preferring to self-describe or not state their gender).

The grantholders survey corresponds to the overall distribution of grants between men and women, but the Regional Partners survey does not correspond to the more or less equal distribution between men and women participating in the Regional Partners' events.

Understandably, those who held longer-term grants would be more prepared to fill out a survey than those who received limited support for a once-off event, but we considered especially the qualitative information of the latter, complemented by

targeted interview information, as robust enough for the development of credible findings.

Reach of the interviews: Interviewees were purposefully sampled, aimed at including representatives from the different types of stakeholders in each of the programme components. We exceeded the target of 35 interviewees in the inception report and interviewed a total of 58 persons, some in a group set-up.

Table 1: The sampling strategy for each method used in the evaluation.

Stakeholder group	Method	Sampling approach
n/a	Document reviews	Purposeful sample guided by the evaluation matrix and available documentation
Stakeholders with strategic and programme overview	Key informant interviews	Purposeful sampling: Persons external to the TWAS ecosystem; representatives from partners - Sida, IDRC, GIS, OWSD, IAP and UNESCO; representatives from the TWAS Council, Steering Committee, Executive Director and senior members of staff.
Programme component implementers	Individual interviews	Purposeful sampling: Heads of Sida supported components; one additional staff member per component
Partners	Individual interviews	Purposive sampling: Representatives of OWSD, IAP and AAAS; Regional Coordinators and ex Coordinator.
Intended beneficiaries - young scientists	(Focus) group interviews	Coequal groups of information-rich members, based on (i) survey results for participants in regional events, and (ii) participants in science diplomacy events held in different regions and in different years – 2018, 2019 and 2021 workshops hosted by ASSAf in South Africa, Bibliotheca Alexandrina in Egypt, and ASM in Malaysia (the latter held on-line).
Intended beneficiaries: participants in RG and RP components	Self-completed surveys	(i) On-line questionnaire link sent to all 217 grantees – 121 individuals and 49 research group representatives - for whom contact details were available for the period 2017-2020 (ii) Online questionnaire link sent to 443 participants in Regional Conferences for Young Scientists over the period 2017-2020. The grant holders survey was sent to both individual and group grant recipients. The second survey was sent out to participants of events organised the TWAS Regional Partners in 2017-2019. Due to the hosting institution's policy, the Regional Partner in Egypt has not been able to provide the participant's e-mail addresses; however, it is also not financed by Sida.

Triangulation was done across methods as well as sources of information. Triangulation across interviews, the method most useful for deepening understanding

of issues captured in documents and surveys, was tracked using RAG evidence assessment rubric. Evaluative rubrics were not used in any of the other assessments.

Data and information were collected and systematically analysed, situated in the various relevant layers: Sida strategies, TWAS's strategic approach to its mission, the programme ecosystem (*i.e.*, including its regional partners) and the individuals and groups supported. Only Excel was used as software in support of data collection and analyses; much was done manually due to the complexity of the information, and the nuanced interpretations required to deliver nuanced findings.

We made the assessments per component and per criterion before doing the necessary cross-syntheses. Before the final assessment, findings were compared to the (mostly implicit) component and programme theories of change, with emphasis on the underlying assumptions. Our understanding of the opportunities and challenges inherent in STLC/LDC contexts helped to frame all analyses. Data were disaggregated by gender where appropriate and where readily available; through interviews we also considered the contexts within which gender responsiveness had to be demonstrated.

Details of each method are provided in Annex 6. A stakeholder list is included as Annex 7. The documents reviewed are listed in Annex 8 and the persons interviewed in Annex 9. A generic interview instrument with a few examples of specific interviews is given in Annex 10. Two surveys, one among grantholders and one among participants in regional partner initiatives, are attached as Annexes 11 and 12, with their quantitative results summarised in Annexes 13 and 14 respectively.

1.6 ETHICS AND PARTICIPATION

The evaluation adhered to the ethical principles detailed in the FCG Evaluation Manual (2020), OECD-DAC Guidelines on Quality Standards for Development Evaluation, as well as relevant legislation. We experienced no ethical challenges in the conduct of our work. Most interviews were conducted with individuals to further ensure confidentiality; groups consisted of persons in a similar space when hierarchy is considered. Persons interviewed were free to refuse and we assured them of confidentiality once they agreed to the interview. None of the issues under discussion were particularly sensitive or exposing participants to risk. However, our efforts to set up interviews with selected refugee scientists were understandably met with caution and requests for anonymity; due to several constraints we delayed these interviews, and hope to conduct them before submission of the final report.

1.7 LIMITATIONS

i. As noted in the Inception Report, the ideal of an integrated mixed methods approach was not possible. Due to the short timeframe, we could not integrate the methods and results in a well-sequenced process. However, while we might have sacrificed some depth, we do not believe this affected the credibility of the findings.

ii. We could not do equal justice to all evaluation questions for all components where primary information had to be collected. Trade-offs had to be made as there was not sufficient time to reach all who could have helped to reach sufficient depth and nuance certain interpretations. All components suffered from this to some extent, with Science Diplomacy and Science in Exile proving to be the most challenging. We concentrated on issues that appeared to be particularly problematic or in need of improvement, and also make a point of referring to our sources of evidence for findings even though it adds to the length of the report.

iii. We could not do a systematic comparison of the programme design and performance with that of similar organisations or initiatives. Our assessments are therefore based on syntheses of interviews, survey data and insights from literature.

iv. Once we received and went through available grants documentation, we determined that a limited portfolio analysis would yield too limited information to justify the time it would take, especially since only a small number of final reports was available.

v. We did a brief literature study to inform aspects of our analyses and findings, but did not feel it was systematic and comprehensive enough to be included as part of our methods.

vi. The survey of participants in regional events had a relatively low response rate (15%), and we recognise that this might provide for a biased sample. We took care to triangulate as far as we could, based on interviews and documents the information from the survey. We also considered the quality of the reasoning reflected in the qualitative information provided by each respondent.

vii. Our surveys were conducted only in English, which might have limited responses. The wide range of countries from which responses were obtained, and the fact that TWAS also uses English for its communications, offset some of our concerns in this regard.

viii. In hindsight we would have benefitted from a survey of the five Regional Partners; we had too limited time to have interviews with all regional coordinators, for example. The scope of their activities as well as the marked differences between them became apparent only upon a more detailed document review.

ix. As highlighted in the Inception Report, it was not possible to do case studies, outcomes harvesting or contribution analysis to trace programme or component impacts. We depended heavily on secondary information in evaluation reports and evaluative surveys, and on triangulation based on interview anecdotes and examples.

x. The challenges posed by COVID-19 had no effect on the evaluation other than having to forego the trust that is normally established during even very brief face-to-face interviews and on-site observations.

1.8 STRUCTURE OF THE REPORT

In Chapter 1 we introduce the evaluation, with details in 16 annexes to the report. In Chapter 2 we introduce the programme, highlighting only the most important contextual factors and programme characteristics. Chapters 3-7 give the assessments of key aspects of the programme according to the five criteria proposed in the terms of references, organised by evaluation question. The conclusions are captured in Chapter 8 together with a summary of the main factors that have influenced programme progress and performance. Finally, we will provide recommendations in Chapter 9. A total of 16 annexes make up a companion document to the report.

2 The Programme in Context

Here we highlight some of the most notable characteristics of the programme of support by Sida in order to help situate the findings and conclusions in the next two chapters.

Given it origin as the Third World Academy of Sciences and its evolution as The World Academy of Sciences, TWAS's programming has been firmly rooted in the interests of the Global South, yet through its Fellows and many diverse initiatives it is able to mobilise scientific expertise in service of society and nature from around the world. This unique advantage is reflected in its desire to help ensure that the Global South can attract and retain the necessary talent to conduct frontier research, contribute to global science to a greater extent, and help solve the many wicked problems the world faces today.

Box 1: Specific objectives of the Sida programme of support to TWAS, 2017-2021

1. To increase the production and use of high quality research of relevance to target countries, conducted by individual scientists, groups and consortia.

2. To support and increase the activities of the TWAS Regional Offices/Partners by providing networking links and opportunities for young scientists and others both within the region and beyond.

3. To build a sustainable TWAS Science Diplomacy programme, supported by a series of partners from both the North and the South, and with an annual programme of activities aimed at enhancing the links between scientists and government representatives.

4. Outreach and Communication: To improve the outreach and impact and hence the possibility of reaching the objectives of the TWAS programmes.

[5. Later added: Science in Exile component, formerly known as the Refugee and Displaced Scientists component.

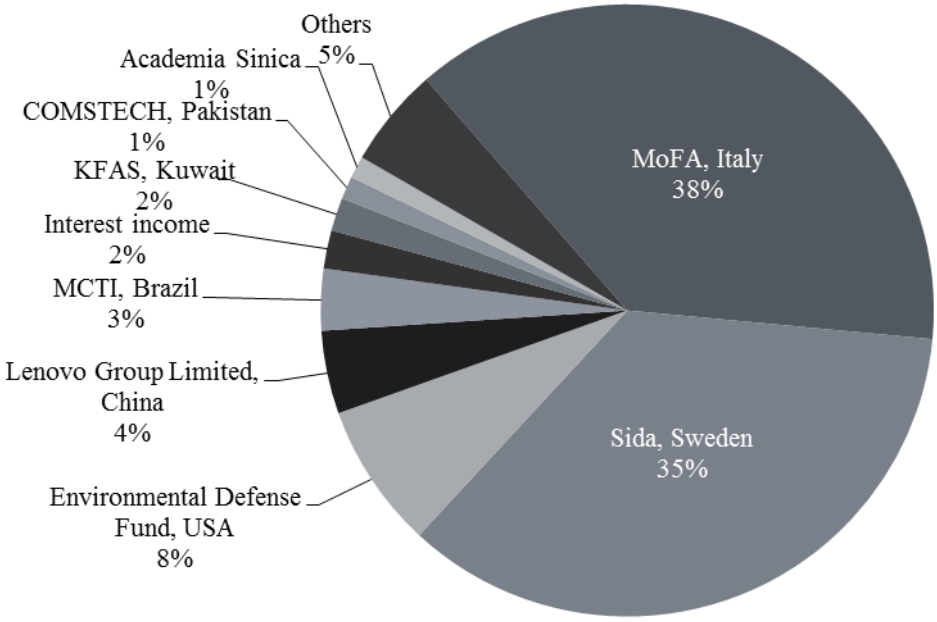
A sound foundation for science in STLCs therefore requires building capacities and providing support to "close the circle" from young scientists working in basic sciences and in basic research, to connecting research contributions to the highest levels of international policymaking. In this programme it does so through a strong focus on 66 STLCs, which are all located in the Global South and include all nearly 50 LDCs. The programme funded by Sida – and any assessment of its performance – needs to acknowledge and consider in its approaches and processes the challenges scientists face who work without the institutional support crucial to advancing science at national and regional levels, or the stimulus of effective pathways to policy and practice applications provided by a well-developed national system of innovation.

Within this broad framing of TWAS interests the programme objectives (Box 1) reflect three areas aimed at strengthening capacities in STLCs and inspiring scientists to stay in their home countries or region – research quality, the isolation of young scientists, and the linkages between science and its application in the (international) policy

environment. Each of the five components of the programme (Annex 2) addresses a specific objective.

Sida is one of the main and most long-standing financiers of TWAS, supporting the organisation for nearly four decades. The two main financiers—Sida (35%) and Ministry of Foreign Affairs of Italy (38%)—cover nearly three quarters of the programme financing in 2017–2020. The trend of two main funders with smaller funding amounts from other governments and organisations has not changed from the previous programme period; this time the main other funders were Environmental Defence Fund (USA), Lenovo (China), and Ministry of Science, Technology and Innovation (MCTI), Brazil.

Figure 2: Breakdown of TWAS funding in 2017–2020 ("others" are each below 1% of overall budget).



Sida's programmes of support have evolved slowly, with occasional incremental refinements in foci and processes. In line with this trend relatively little has changed between the current and previous phase of support (2012-2016). In this phase the establishing and support of research consortia between STLCs appear to have a lower explicit profile, although regional events provide opportunities for relevant connections. The focus on individual capacities remains strong, with a continuation of research grants, regional partner-facilitated events for young scientists and an increasing promotion of Southern capacities in science diplomacy. The focus on dissemination of Sida programme information before 2017 has been expanded in the current phase to address outreach and communication in service of the whole organisation. The engagement with the plight of refugee and displaced scientists in the Science in Exile component is hailed by relevant TWAS stakeholders as a promising new addition.

Planned programme activities were disrupted in 2020 by the COVID-19 pandemic. Adjustments were quickly made, providing an opportunity to reach a much wider audience at much lower programme cost through all events held on-line for the first time. In the aftermath of the pandemic, and in the face of the multiple interconnected global crises as well as opportunities that define the era of the Anthropocene, an important decision lies ahead: Will TWAS programming, and from our point of interest the Sida-funded part, be able to continue to evolve incrementally, as is indicated in the 2021-2025 Strategy? Can it be transformative in practice? What could or should be the role of Sida's support in this new context, given Sida's own evolving priorities?

The TWAS Sixth Strategic Plan 2021-2025 provides some guidance. We positioned our assessment with the expectation of rapidly changing priorities and disruptions that are shaping the future of science worldwide. This global context has also prompted us to consider how a complex systems view of change under these circumstances might influence the co-design of future interventions by TWAS in collaboration with Sida. We discuss this in the final chapters of this report.

3 Findings: Relevance

EQ. To what extent have the intervention objectives and design responded to (i) intended beneficiaries' priorities, (ii) regional and (iii) global policy priorities? Are they still relevant for this time?

Finding 1. Sida's funding fills an important gap in the international financing of research and gives TWAS a valuable and appropriate niche: the support of basic research through the Research Grants (RG) component. This is a valuable niche. Many donors support applied research, especially in the context of the SDGs. Although it does not specifically mention research, Sida's 2015 strategy, too, has a very applied orientation and shows this in its funding of organisations such as the International Science Programme (ISP) and the International Foundation for Science (IFS). But the ability to conduct applied research requires a foundation of basic research, and this essential relationship serves as a rationale for Sida-TWAS co-operation on basic research. This approach has been well reflected throughout all grants review, allocation and reporting processes.

Finding 2. However, at a higher level of abstraction, the programme is unclear about whether its support is to basic research or basic sciences—and what is meant by either. A caution is therefore necessary. The project document speaks about "basic sciences" in two meanings: primarily as an opposite to applied sciences, but also possibly as a shorthand for mathematics, physics, chemistry, and biology. In contrast, the latter meaning is how a Sida key interviewee explained they primarily understand it; it is also how Sida-funded ISP defines them[3]. The project document also mentions basic research, as do instructions to referees, which recommend that applied research, such as pollution monitoring, should not be funded. Interviews with programme stakeholders found no consensus over what is meant by basic research and basic science, or what the programme means by both. In contrast to Sida's view above, one reviewer explained that they primarily mean pure research with no immediate applications. Applicants are confused, too: some reviewers noted that many applications that are turned down are very far towards the applied end, such as science education research or organising activities.

[3] https://www.isp.uu.se/basic-sciences/

Finding 3. TWAS grant calls and review processes recognise the need for projects to respond to key regional and global policy priorities. Yet the grant applications in the RG component rarely excel in this. Despite this situation, in practice many TWAS-funded projects have immediate applications in their country contexts even if not submitted with policy relevance in mind. TWAS grant review criteria include 0-2 points for "benefits to home and host countries"—just enough to tip the scale between two otherwise equal proposals, but not enough to lose many high quality basic research applications. Excellent proposals in geometry without real-world applications still get funded, but it is easier to get a proposal accepted if it addresses some policy priorities. However, reviewers disagree about what this means when dealing with basic research. One reviewer noted that it would be very easy to identify a particular national policy or such and refer to it, but that is not very often done in applications, which seems to indicate that applicants are not particularly aware of the policy environment within which their work might be useful. Yet in modern science no dichotomous relationship exists between basic and applied research[4], and many projects funded by TWAS are deeply rooted in the specific issues and problems of their home countries. Many TWAS grantees are interested in helping their countries and are thinking about their research - not necessarily in terms of policies, but in terms of development challenges, poverty reduction, water and environment. While the latter is to be nurtured, it also provides justification for the increasing emphasis on the science, policy and science diplomacy nexus expressed in the TWAS Sixth Strategic Plan, 2021-2025.

Finding 4. Most grantees surveyed perceive TWAS grants as relevant to their needs and priorities, but would welcome more diversity in types of funding. A majority of survey respondents (58%) were happy with TWAS's current funding types. Applications show their relevance to individual scientists in the Global South – applications for the Science Diplomacy courses have been ten times more than could be accommodated, while in regional events applications have been between two and five times more than could participate. Still, more than one in four (29%) survey respondents suggested that TWAS could re-consider what they fund to better serve the needs of grant awardees' research, especially the financing of fieldwork (although this can be covered where requested) and support to PhD students from the same grant scheme. Interviewees had many more items on their wish list, including basic requirements for an environment conductive to research such as secure lab spaces, roads, institutions and a well-working Internet. This reinforces the importance of viewing the contributions of this programme from a systems perspective, an aspect further discussed in Chapter 8.

Finding 5. The Sida-supported Regional Conferences for Young Scientists (RCYS) not only serve to connect isolated young scientists, but reflect priority areas of interest within the region, the Global South and/or globally – often connecting with trends and applications beyond academic science. A large majority

[4] Stokes, D. E. (1997). *Pasteur's Quadrant – Basic Science and Technological Innovation*. Brookings Institution Press, Washington, DC, USA.

of survey respondents agreed (40%) or strongly agreed (49%) that the themes of the events in which they participated were relevant to the development goals of their country or region, and that the event helped them to get a better understanding of scientific issues affecting their region (35% and 51% respectively). Each TWAS Regional Partner[5] has its own approach to identifying themes for RCYS and its accompanying workshops or courses. SAREP has, for example, an advisory structure to help identify priorities on the continent, and issues a competitive call for proposals in order to select the best justified proposal. Such a systematic approach is not shared among all Regional Partners, but the relevance of the topics and the connections to the 'bigger picture' within which science is done and advanced regionally and globally are reflected across all events. This is a trend throughout the initiatives of the Regional Partners; nearly a quarter - eight themes of the 31 events organised or sponsored between 2017 and 2020 - made explicit reference to climate change, for example. It strengthens the relevance of these conferences beyond what was originally noted in the proposal to Sida.

Finding 6. The efforts to ensure localisation in each regional context have received much support from respondents and interviewees, and so have the events that allowed learning across regions in the Global South. However, the important matter of decolonisation has not been sufficiently explored. Among respondents and interviewees, only few noted that (some of the) event sessions in general were not directly relevant to their work. This is unsurprising, given that they were selected for participation based on their interests and fields of work. But they also confirmed that the individual sessions were generally tailored for the region in which the event was held. In a few instances interviewees referred to case studies that were adjusted after requests to better reflect local contexts and ways of working. Several survey respondents and interviews also mentioned enjoying the opportunity for cross-regional learning that showcase experiences from other parts of the world, in particular in the Global South. Two interviewees noted the importance of making sure that voices from the Global North do not dominate. Despite this, it is notable that very few interviewees who participated in the events in the regions were aware of the decolonisation debates prominent in the higher education sector in certain parts of the world – something that has to be considered across the spectrum of scientific research.

Finding 7. The relevance of the two newest programme components - Science Diplomacy and Science in Exile – flow from the urgency and timeliness of the initiatives given global trends and needs, and from the capability of TWAS and its partners to convene diverse actors across multiple boundaries. The Science in Exile component is highly relevant at a time when global instability and conflict due to global power shifts, societal tensions and climate change are rapidly increasing the number of displaced persons and refugees. The global scale of the challenge calls for

[5] Sida supports the Regional Conferences for Young Scientists in TWAS Latin America and the Caribbean Regional Partner (LACREP), TWAS Sub-Sahara Regional Partner (SAREP), TWAS Central and South Asia Regional Partner (CASAREP), and TWAS East and Southeast Regional Partner (SAPREP). The TWAS Arab Regional Partner is supported by the Kuwait Foundation for the Advancement of Science (KFAS).

the leveraging of resources as well as active collaboration by stakeholders from the Global South and the Global North. The relevance and value of the involvement by TWAS, the ISC and other partners lies in their credibility and capability to convene actors across different types of boundaries, whether geographic, disciplinary, sector and fields of work. The Science Diplomacy component, which since its establishment was considered to be pioneering, highlights the role of scientists in global conventions and endeavours such as the IPCCC and IPBES; over the past five years and especially during the COVID-19 pandemic science has become more visible, political and global, and this is set to continue as the multiple interconnected crises of climate change, biodiversity loss and pandemics intensify. The relevance of this initiative lies not so much in job opportunities for scientists, or in connections with national and especially international policymakers and negotiators; rather, their relevance lies in their opening of the eyes of young scientists to the role and value of science beyond academia and beyond the national policy domain. Among the persons interviewed, this 'big picture' exposure has clearly been inspirational, and in some cases, even felt as transformative.

EQ. To what extent have lessons learned from what works well and less well been used to improve and adjust intervention implementation?

Finding 8. Even without a full-fledged monitoring, evaluation and learning (MEL) system TWAS staff show responsiveness to what is being recommended, experienced and learnt, although there is room for improvement. For example, the 2016 evaluation presented a number of suggestions related to the TWAS grants component, many of which were implemented. The programme is implementing the Most Significant Change method and questionnaires to track progress towards medium/long term goals, as well as effects on organisations, policies, and other theory of change elements. Those are better captured by the new MEL system, with data collection more systematised and able to deliver the key indicators. TWAS has refreshed its classification of countries eligible for grants. A theory of change for the science diplomacy component has been developed. Learning from feedback and experience has also been done, for example in the lengthening of the grants reporting period from 18 to 24 months, streamlining slow procurement processes, and increasing efforts by the science diplomacy team to find and include more appropriate local case studies, speakers from the Global South and cross-cutting issues. The incorporation in 2019 of a 'training of trainers' course in science diplomacy is an example of responsiveness to need and opportunity. On the other hand, such responsiveness is neither systematic nor driven by a system of accountability. Some recommendations in the 2016 evaluation report have therefore not been pursued: efforts to strengthen interaction with other Sida-supported programmes remain limited, there is still no clear theory of change for several components or for the overall programme, and an external evaluation of scientific training and research is outstanding.

4 Findings: Coherence

EQ. How compatible has the intervention been with other interventions in the sector or organisation where it is being implemented?

Cooperation, alignment and harmonisation – within and between TWAS, Sida, Regional Partners and other local as well as international or global actors – can create synergistic effects that can strengthen the effectiveness and impact of the programme, but such efforts can also be detrimental to progress if they take up too much energy and time. For a deeper understanding of the pros and cons, a more comprehensive evaluation focused on tracing this aspect together with the assessment of impact will be necessary.

Finding 9. The relevance of the Sida programme components within the *system* of science support and capacity strengthening in STLCs/LDCs offers many opportunities for alignment and harmonisation. Efforts to collaborate with key organisations have been made, but serious cultivation of synergies have been stymied by limited staff time and insufficient *strategic* focus on how best to create coherence and synergistic effects. TWAS has not had a theory of change for its work with LDCs/STLCs, or an emphasis on how to build upon its own or others' efforts in the process. The programme therefore suffers from lack of a *strategic approach* to cultivating alignment and harmonisation within TWAS as well as among the five Sida programme components. Theories of change would also force programme developers to explicate and justify their assumptions about how change happens and, by doing that, improve the credibility and coherence of the programme document. It is inspiring to see how many collaborations abound - partnerships around convening, piggy-backing events on one another, bringing participants across different boundaries (disciplinary, geographic, age) together during thematic events such as the RCYS, and providing multiple opportunities to advance careers through the diversity of Sida-supported and other programme financing opportunities throughout their career. But although impressive, the actions taken tend to be ad hoc and initiated within limited staff time. Reporting is done in silos, and partnerships are mostly based on opportunities for financing and in-kind support. Everything does not need to connect to everything else, but the approach to date does not constitute serious, systematic engagement with how *synergistic effects* can be purposefully created to help accelerate progress towards desired outcomes.

Finding 10. Regional Partners offer as-yet-unexplored potential for the cultivation of partnerships that can create more strategic, long-term alignments and collaborations, including on cross-cutting issues. TWAS's close proximity to IAP, ISC, OWSD and GIS offer obvious opportunities that have yet to be systematically

explored, whether at TWAS headquarters or in regions. At global level the partnership between TWAS and ISC with IAP in the context of the Science in Exile component provides a good example of such a strategic approach. We understand that the connections between TWAS and the Regional Partners are strengthening; the three-monthly informal meetings are a welcome development, although even that does not appear to give sufficient space to inspire strategic initiatives by Regional Partners individually or as collective, including on thematic areas or cross-cutting areas (sustainable development, environment, LDCs and gender). Yet there are successful collaborations, for example with the TWAS Young Affiliate Network and national science councils. South-South cooperation is demonstrated through cross-regional participation in thematic events; African LDC participants in a workshop in Bangalore described their experience in glowing terms: "*We saw that developing countries in Asia have excellent science*!" The question is how to build on what exists to ensure the most value out of the valuable connections that the Regional Partners have without over-emphasising creating synergies among all.

Finding 11. Sida's own harmonisation efforts are more focused on their big bilateral programmes than on multilateral programmes that do cross-cutting work, such as TWAS, AuthorAid, and SciDevNet, but offer opportunities for connections with the TWAS Sida programme that have not been explored. Regarding the bilateral programmes, a Sida interviewee explained that their elements must fit each other and other similar programmes, and whole programmes need to fit each other, which takes much more coordination. Regarding the multilateral programmes, Sida's harmonisation efforts are more about disseminating information across them and promoting programmes to work with each other. Interviewees confirmed that, for instance, TWAS and OWSD share a lot of information between programmes about their opportunities, yet those who had experience of OWSD requested better collaboration between TWAS and OWSD. While a Sida representative noted that harmonisation is a lot of work, initiatives like the TWAS research grants component would benefit from more strategic coordination efforts with other similar programmes, many of them funded by Sida, too. Yet, correctly, Sida considers the TWAS grants component in itself as a complementary initiative to their bilateral programmes. TWAS grants fill an important gap between PhD training and large research grants for established researchers, while also highlighting a clear need for (small) postdoctoral grants available for junior researchers.

Finding 12. There is room for TWAS to strengthen communication activities that can enhance the potential synergies between its programmes. Of respondents to the grantholders survey, 87% were familiar with additional TWAS funding opportunities they could use to support their project. Among the respondents who participated in regional events, the number dropped to 52%. Although 63% of grantholders survey respondents stated that TWAS connected them with other TWAS-funded projects in the region, 18% stated it did not. Interviews confirmed that there is room for more activity in this area. There were also some calls to increase coordination between TWAS projects to maximise equipment use: "*I'm not aware of other TWAS projects in my country. … if I was aware of the other TWAS-funded projects within the region I*

would be able to perhaps [help and] *get help. Now that information is not being relayed*". There was more an agreement that TWAS has helped projects to work in synergy with other similar projects in their fields (79% agreement), and an encouraging 38% of projects actually do actively collaborate with other TWAS-funded projects in their fields.

Finding 13. Grant applicants have not sufficiently made use of the availability of mobility funds as potential mechanism to stimulate suitable connections that can help scientists to maintain or advance quality research. Although applicants can include travel funds in their budget, they often do not do that—even when mobility would be considered a positive element in the application. That risks isolation and end of progress: "*they return* [from their PhD studies], *they start to decrease and diminish; they may have a good PhD thesis and good articles, and when they return, their level starts to go down*". One key interviewee suggested that TWAS could better market the importance of and possibilities for travel budget in projects - even though TWAS believes the option is sufficiently marketed on the website and in forms, it remains underused. Another emphasised the importance of many underused options that TWAS provides – getting the right textbooks, access to the right journals, the ability to communicate with other scientists, and travel: "*If you're an experimentalist, moving around is very important: to go and see what's being done in other places. How people approach science, how they think about problems, what their thought processes are. They need to get out*." Another key informant suggested that funds for mobility should be included for South-South exchanges or other types of international co-operations.

EQ. Is there a risk that Sida funds are used for too many activities? Or is it an opportunity?

Finding 14. ithin the framing of Sida and TWAS approaches and strategies for research support, there is no obvious reason to drop a programme component, and any effort at integration or a robust effort towards a more holistic, transformation-oriented approach has to build carefully on what exists. Each programme component has its merit, with significant accumulated experience and valuable contributions over the years. Each fills an important, even unique niche in the systems that support and enable science capacity strengthening in LDC/STLCs. Even in the absence of a coherent theory of change there is sufficient logic to link the pieces in principle, even though they operate more or less in isolation of one another. The RG component, the largest by far in terms of budget and effort, is a solid unit where all pieces fit together well. It funds a handful of things—material, equipment, literature, stipends, open access fees, conference travels, Masters students—which all support one another (although applicants do not always make full use of the package). There is no risk of dispersion and loss of focus, and while its transaction costs – the time, energy and other resources taken up by smallish grants and once-off activities - are relatively high, this is offset by gains in other components through the Regional Partners with their valuable connections that make for efficient and cost-effective management. Renewal in, and/or addition to the SIDA-TWAS agreement is possible and, as interviews with key informants indicated, even desirable if TWAS strives to make use

of the stronger leverage points offered by leadership or institutional level foci. However, for pragmatic reasons, whatever is done has to be crafted in ways that do not diminish or ignore the value of what has been achieved over past decades.

Finding 15. The programme covers many countries, and differences between them complicate the ability of the programme to adjust to all contexts equally well. For example, one grantee believed that it is difficult for him to win a group grant as there are few PhD student positions in his university: There are enough PhD grant programmes that nearly all promising candidates who apply can get PhDs in the US, EU, Japan or Australia. The age limit for young scientists, 45 years, was generally accepted although not always liked. For example, one grantee explained that it is typical in his country to get PhDs when relatively old, between 40-50 years, as in-service PhDs. For most intents and purposes, academic careers start from PhD defense. And a 46-year new PhD holder can be "young" in his or her career. Several survey respondents suggested that because maternity delays women's entry to research careers, the age limit for women should be removed, or additional years allowed for each child in the family.

Finding 16. The size and modality of the grants given by TWAS are generally right for the grantees' priorities, despite some who disagree. For their intended purpose, the size of grants appears to be about right. The "monetary value is not very large, but it's significant enough to start a career"—they were understood as seed grants on one's way to bigger grants. When asked what they would like to see added, the most common responses in surveys and interviews were items commonly funded by other programmes, such as PhD student grants, salaries for support personnel and research assistants, short courses and workshops, and increased journal access. Funding for field work was considered important in many basic sciences. To cover increased electricity bills, office space, and lab spaces, additional overheads was a common request. Funds for clearing and handling of goods at customs were requested where they were a problem. **All these items point at aspects lacking at systems level in recipient institutions.**

One survey respondent wrote that TWAS grants fill an important need for junior researchers to win funding for projects that would not stand a chance in bigger, more competitive grant calls. The "monetary value is not very large, but it's significant enough to start a career"—they were understood as seed grants on one's way to bigger grants. Those grantees and reviewers who wished grants to be bigger did not ask for an order of magnitude change, but modest increases: an added $10,000, for instance. There were some requests to change the grant modality to be fellowships and go directly to the scientists. Increased collaboration and mobility were suggested by a number of key stakeholders on TWAS side, who said that a few months' exposure to some established institutions and meeting central people in their field might give them role models to follow, new ideas about interesting problems, and personal networks.

Finding 17. Questions were raised about why the grants are described as individual researcher grants when they are meant to be for the whole institution—but that is not a clear case in all granted projects. While 95% of survey respondents reported that the grant has directly improved one or more courses in the grantee's university, more than half (56%) of respondents said that the equipment provided by the TWAS grant is for research purposes only and not used in undergraduate courses. This does not negate the fact that there are some who use it at that level; according to reports, in 2017 for example it was reported that 313 other students (undergraduate and graduate) and 156 other persons such as lab technicians benefitted from TWAS grant equipment to institutes (it will be important to triangulate such statements with ripple effect evaluations or case studies). One suggestion by a grantee was that TWAS grants should be granted to institutions, not single researchers. That is of course something done by multiple other funders, but will require a significant change in strategy for TWAS.

5 Findings: Efficiency

EQ. To what extent has the intervention delivered, or is likely to deliver, results in an economical and timely way?

Finding 18. TWAS has done much to be efficient (and cost-effective), and continues to seek ways to enhance this. Some illustrative examples include the success with which it uses the Regional Partners for localisation, working with units who know the local contexts and have multiple useful connections. The resulting process efficiencies, as well as the in-kind support and local fundraising efforts are significant and a real boon for TWAS, as these resources enable the Regional Partners to facilitate the communication and administration of conference, prizes, support to the fellowship programme and the TWAS Young Affiliates Network, travel grants, information for LDCs and the selection of affiliate members.

Finding 19. TWAS has benefitted greatly in terms of efficiency and cost-effectiveness from the localisation efforts through Regional Partners, but without new strategies and approaches in the aftermath of COVID-19, this might be reaching its limit. The Sida-financed allocations to the Regional Conferences for Young Scientists in four of the regions are by all measures small compared to the benefits gained from these events. This situation has further benefitted from the linking of complementary workshops (such as those in science diplomacy) held in tandem with the conferences as cost-saving and efficiency-enhancing measures. These efforts would not have been possible without the dedication and efficient in-kind contributions and support of the Regional Partners as well as their partners in the countries where these events are held – some of which have been LDCs. It is important for TWAS to take note of the fact that the benefits for the RP, the country and co-financiers such as government departments have to be sufficient to justify their continued engagement and support. There are signals that in the aftermath of the COVID-19 pandemic national and institutional priorities for resource allocation will change, and it is not clear that TWAS has been positioning its cooperation with the RPs, national and other authorities in a suitably visionary way to ensure their continued support.

Finding 20. Moving on-line in different ways has added to operational efficiencies, but in the aftermath of COVID-19 caution is needed to make sure the advantages outweigh the disadvantages. TWAS has over the past five years done much to enable the full implementation of an on-line grants management and more recently data monitoring system. These efforts, as well as dedication by key staff have greatly increased efficiencies in operations; this is widely recognised among interviewees despite improvements that can still further enhance progress in this regard. TWAS has also successfully moved its many events on-line in 2020 in response to the COVID-19

pandemic. This has lowered costs, enabled the participation of more famous speakers and increased the reach of the events and hence of their potential value and influence. However, multiple participants in such courses have complained in interviews that the very real value of building trust, understanding and relationships during face-to-face meetings is lost; and attention spans are shorter and distractions are more. This is supported by wider research. The understandable intent to explore blended events in future will have to be done with full cognisance of what has in the past been foundational to the value and impact of TWAS activities.

Finding 21. TWAS has made impressive efforts to maintain process quality standards in the localisation efforts of the Regional Partners through the RCYS, but this comes at a cost - and not everything goes well at all times. In addition to the conditions set out in an annual contract and work plan per Regional Partner, TWAS provides detailed guidelines for each activity organised under the TWAS banner. This is valuable in limiting reputational risk. And apart from this, each RP is also regarded as a highly credible and responsible organisation. Interviews and the Regional Partners survey therefore brought to the fore only few instances of administrative and other inefficiencies. For example, one third of survey respondents noted that requests for information from the conference organisers elicited responses within a day, while for another 51% it took 2-3 days; 15% found it to take longer – a reasonable situation that can still be improved. Among the very limited operational problems participants experienced was the need for some LDC scientists from other countries to pay local transport costs which some claim they were not made aware of, or poor accommodation for the local scientists compared to those who came from elsewhere. However, the focus on administrative processes and operational efficiencies has come at the cost of a wish for strategic input into TWAS approaches expressed by some of the RPs, as well as their wholehearted ownership of initiatives.

Finding 22. Procurement organised by TWAS is considered by persons interviewed and surveyed as vastly superior to other available options, but not all works well, especially when the different country contexts are considered. Especially compared to many bilateral programmes, where inefficient and bureaucratic procurement is a common source of delays, extra expenses, frustration[6], and sometimes even corruption, TWAS doing the procurement process is universally appreciated. Half a dozen interviewees named better warranty terms, faster delivery, easy import, more secure shipment, less hassle with currency exchange rates, and no risk of counterfeit basic tools like laptops—compared to local vendors or their university procurement services. Other procurement options may have single benefits, but overall there was a consensus over how well the TWAS procurement worked, and especially the TWAS administrator's initiative and responsiveness in the process.

Although a vast majority of respondents were happy with the procurement, things do not always work well, and a number of survey respondents did not consider procurement fast (18%) or the procurement process very clear for them (11%). Local

[6] Kruse, Stein-Erik; Tedre, Matti; Nakatibeb, Teshome; and Amani, Aimtonga (2014). Evaluation of the Swedish Research Cooperation with Tanzania 2009–2013: Final Report. Sida.

bureaucracy had slowed down procurement for 29% of respondents. And even if UNESCO is exempt of taxes, issues still remain with duties, port fees, expensive import paperwork, and slow customs clearance. A majority of respondents prefer TWAS procurement over doing it themselves on in their universities. However, there are great differences by country: In some countries, grantees said they needed to do one or more of the tasks above by themselves and some have paid some fees from their own pocket. In other countries grantees had their equipment brought directly to their lab and installed. Many survey respondents complained about goods not delivered on campus but to customs at the capital city, perhaps days away, with costly transportation.

Finding 23. UNESCO is not an agile organisation to work with, and its internal harmonisation efforts—which donor countries like Sweden support—have caused concerns around inefficient double administration. UNESCO's complex and rigid regulations have been a source of administrative burdens and frustration at several levels and over a long period of time. For TWAS, tighter merging with UNESCO's procedures and administration risked it losing its identity, yet at the same time TWAS is a part of the UNESCO family. For some donors, UNESCO's changes in policy have caused serious concerns - especially its plan to implement 7% management costs have caused tensions between the stakeholders. Administering a programme at two levels (UNESCO and TWAS) can be readily seen as an inefficient use of funds and an inefficient way of running a programme—and such double administration is not something Sida would be ready to pay for.

Finding 24. The transaction costs inherent in the nature and size of TWAS grants and its other forms of support nature hamper efficiency. The RG component requires per year processing of more than 100 orders for equipment, consumables and literature; selection processes with applications ten more than what is granted; and the management of around 50 grants. There are inevitably significant transaction costs in the scattering of relatively small size grants to individuals and units across many different countries, especially given the challenges posed by poorly developed institutional systems in LDCs, and the need to ensure harmonised approaches between Sida, TWAS and UNESCO.

Finding 25. Even if they are relatively fast - objectively assessed - the time certain TWAS (and by implication UNESCO) processes take, or aspects of how they are handled, undermines their usefulness for some purposes. Some found procurement and other service-related processes uncomplicated, but others reported issues. For example, when open access fees need to be paid, this has to be done immediately, but TWAS/UNESCO processes can take up to a month. Transfer of money to MSc students through the universities' faculties is a long process. There is further discontent about how the conference grants are organised: the grantee pays everything and is reimbursed later, but not all scientists in LDCs have several thousands of dollars readily available; many may not be aware that TWAS makes arrangements for those who might not have the means. The same applies to open access publishing fees. Universities often, but not always, help with both. A minority of respondents considered TWAS's rule to not allow researchers to handle money themselves as creating more difficulties than it resolves –

including reflecting a lack of trust. Yet despite such glitches, a clear majority of respondents (82%) considered that the support made available by the TWAS RG component was readily accessible, with limited administrative challenges, and only one in ten (11%) disagreed.

6 Findings: Effectiveness

EQ. To what extent has the intervention achieved, or is expected to achieve, its objectives and its results - including any differential results across groups?

Objective 1: *To increase the production and use of high quality research of relevance to target countries, conducted by individual scientists and research groups in STLCs.*

Finding 26. The TWAS RG component is generally producing its promised outputs - and mostly, although not always, on target. The extent to which promised outputs were delivered and targets met is captured in Annex 3. Items are purchased and delivered, research laboratories improved, workshops attended, results published, and students graduated. This does not mean that all is done flawlessly. Projects can fall between the cracks and get delayed indefinitely, and some targets are not met. But the situation is improving: In individual grants the target of 70% grants to LDCs/STLCs was met once (2019), and in group grants twice (2019 and 2020). The number of individual and group (research unit) grant recipients fluctuated by the budget each year, but was roughly at the same level as during the previous programme period. Individual grants were relatively gender balanced (40% or more for both male and female). Group grants were much less balanced, with the number of female grantees varying from 16% to 28%. And unlike the LDC/STLC figures, gender balance in group grants did not improve over time.

Finding 27. The quality of TWAS grant applications has steadily improved, which has improved the projects. A key informant who had more than 15 years of experience with TWAS grants described how year by year there has been better applications, more experienced applicants, better CVs, and increasingly PIs with PhDs from the US, Europe, China or Australia.

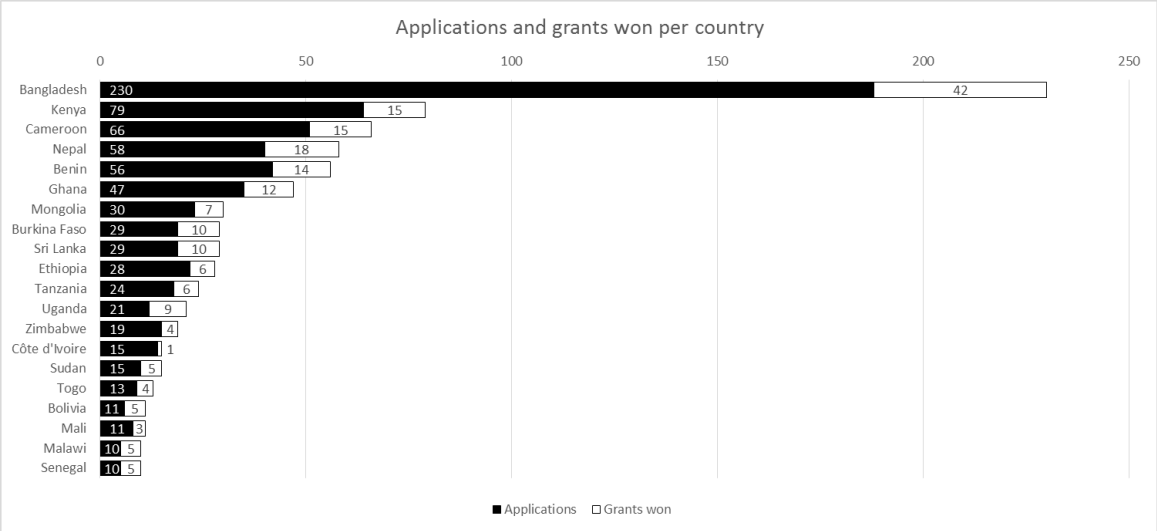
Finding 28. Reviewers of grant proposals take affirmative action with regard to scientists from LDCs, but this is not sufficiently reflected in the final allocations. To increase the programme's support to scientists from LDCs, the project document stated that TWAS aimed at separating the applications between those from LDCs and then "others," and the LDC/STLC group would be assessed first and priority given to *all quality applications* in that group (p.22). This has not happened. Quality applications from LDCs are routinely left without grants: TWAS reports that the number of applications by females or LDC-based researchers who were left without award was 23 in 2017, and 33, 36, and 29 in the following years[7]. At the same time the percentage of LDC-based grantees was more often below the 70% target than not[8]. This

[7] Application and Award overview

[8] Ibid.

is part of the balancing act TWAS has to do between the many criteria they should meet, and it is therefore encouraging that it has improved towards the end of the period. Figure 3 shows a list of twenty countries with most applications, as well as how many applications from each of them were granted funding (Figure 3 also sheds light on why not all high quality applications from LDCs can be granted funding).

Figure 3: Top 20 countries in terms of number of applications and grants won



Finding 29. Interviewees felt that publications are the key output towards TWAS; one which could secure them another grant in the future. At the same time, many of them were eager to talk about the applications of their results, and those applications were often well aligned with SDGs, national policies, and global environmental agenda. Although many interviewees considered their research to be basic research, they had immediate applications in mind and had applied to other grants for more applied parts of their research.

Finding 30. 'High quality research' is not necessarily a given, and depends on the definition of 'quality', especially from an LDC perspective. The most widely accepted indicator of quality (especially basic) research in academia is linked to journal publications, and many grantees had the (misconceived) idea – even if not articulated by TWAS - that the way to win more grants is to publish a lot. The small grants given by TWAS can hardly be expected to yield many publications, and pushing out large numbers of low level publications is not an example to follow – even in LDCs where just the fact of publishing may be seen by many as an achievement in itself. This is even more so when there is an emphasis on supporting the best young scientists with the intent that they will be future leaders in science in their countries. Interviews with grantees confirmed the concerns of some interviewees in TWAS. One interviewee put what they intend to do bluntly in terms of quantity, not quality: "*you know if we have a grant we have to do reports, so we are obliged to publish in order to win another grant … It's motivation to have more publications*". This is a perception that likely

stem from university or funders' requirements in general. TWAS does not encourage a focus on quantity over quality, and **in future TWAS could actively discourage this tendency by something as simple as limiting the number of reported publications to one only.** Knowing that just one publication will be registered, would work as an incentive against salami sliced results, low quality journals, and pay-to-publish predatory publications. It would encourage meaningful, solid reporting that is not done in a hurry.

Finding 31. The tracking and reporting of output performance is not nuanced enough to promote and ensure research of quality. There was no time to evaluate systematically the quality of open-access publishing venues funded for TWAS grantees, yet questions about the quality of research outputs from TWAS grants were raised by more than one key interviewee. Two of them also pointed out that the best journals, and high quality journals in general, often have fee waivers for LDCs, and were concerned that the open access funds end up used for lowest-tier or predatory journals. For example, one TWAS-funded project that received open access support reported back five publications in predatory journals and two in journals of questionable quality. Predatory journals are to be avoided due to their business model that relies on revenue from article processing charges (APC), aggressive e-mail marketing, high volume article throughput, and low or no quality control. Publishing in them is not recognised as an academic merit for the individuals, and supporting dishonest non-academic entrepreneurs is problematic. It will be important for TWAS to keep alert to not spending open access funds on predatory journals, and keep communicating to grantees how to avoid predatory publishers.

Finding 32. There are some examples of impactful collaboration between TWAS-funded projects, but they are not very common. Most survey respondents (70%) and some interviewees credited TWAS for advancing their international networks—even if not as actively as it could have been. Nearly one in four (23%) were able to list co-authored articles with other TWAS grantees. TWAS has a number of initiatives for facilitating collaboration, but those are not helpful in the face of different specialisations and geographical distance. There are, of course, examples of activities like TWAS conferences leading to joint funding applications, plans for joint research, and joint articles, but many of those connections dwindle over time. Most of the useful outputs from networking may be generic and not discipline-specific, or immediate and not long-term; they are nonetheless important. For example, one grantee connected through TWAS with people who enabled that candidate to do a TED talk, to be nominated for an award, and to get an excellent career start.

Objective 2. *To support Regional Conferences for Young Scientists, especially those from STLCs, to be organised by the TWAS Regional Partners.*

Finding 33. TWAS continues to benefit from strong and productive connections with the four Regional Partners supported by Sida funding. Contracts signed each year with Regional Partners lay out expectations and form the basis for a jointly agreed workplan. The Partners support TWAS programmes in many different ways, helping

with awareness raising and communication of opportunities including the Research Grants component, soliciting participation, organising or overseeing the organising of events, initiating and engaging in relevant events, leveraging funding, and more. Although the extent of engagement cannot easily be determined and will differ from region to region, Partners are reference points for networks and individual young scientists; survey results show that 30-40% of the respondents had engaged with a Partner office before the event under discussion. Reports also show many good examples of productive relationships and joint action, for example with the TWAS Young Affiliates' Network; other networks are less active, and the Partners might be well positioned to play a more active role in this regard.

Finding 34. Delivery with respect to the Regional Conferences for Young Scientists has been in line with expectations. An impressive 31 events were held between 2017 and 2021 to connect young scientists with one another (Annex 3) - including at times across regions - and with senior scientists from around the world. One RCYS was held each year in each of the four Sida supported regions, often complemented by a workshop or course held in tandem to save costs, time and effort. Applications for participation in these events were massively oversubscribed, an indication of their relevance and the need of young scientists to connect with others. Records show 657 participants in these events, fewer than in the previous phase of support between 2012 and 2015, when the Regional Partners organised 31 events recorded as having been attended by more than 1,200 participants. It was especially impressive - and useful for the sake of capacity strengthening and profile - that some of the Regional Partner events were successfully organised in impoverished LDCs such as Sudan.

Finding 35. The reach of TWAS through these regional events has exceeded most expectations in terms of the range of disciplines and countries, representation from LDC countries and gender balance. Targets set for female participation were met each year (Annex 3), although not to the same extent at each event. Many disciplines and areas of work were represented - 39% of survey respondents who participated were from areas outside the four basic sciences that qualify for TWAS grant support. Between 10-20% of respondents had also benefitted from support through more than one TWAS modality. Young scientists from LDC countries were targeted for participation, and although no clear target had been set, except for 2017 each year saw 50% or more of the participants from LDCs.

Finding 36. Survey respondents see special, even unique characteristics in the RCYS and connected events, indicating what they appreciate in such opportunities. Specific aspects mentioned more than once include the fact that they are "organised by Africans for Africans". They provide opportunities to learn across many countries with similar problems - even from other continents (the Africa-Asia interaction was seen as particularly valuable). South-South cooperation seems particular important, showing that "impressive researcher role models can also come from developing countries". They focus on the interests and capacities of young researchers, connecting them to one another which makes it easy for them to interact,

but also gives them opportunities to meet senior scientists from both the Global South and Global North. They highlight connections between different disciplines and fields of work, and bring together scientists and policymakers.

Finding 37. Not everything went well during the events. Points of critique were not many, made by a minority of respondents and interviewees. Of the Regional Partner survey respondents, the expectations of 55% were fully met, and another 39% to some extent. Reasons for some dissatisfaction revolved around relatively minor operational issues: poor accommodation for local scientists compared to international visitors and insufficient information provided, for example about the fact that local transport costs would not be paid; insufficient interest in the topics covered by the event; a rigid schedule with insufficient time to do justice to the discussions in sessions; not enough follow-up to facilitate connections and publish contributions on-line rather than only in a physical publication. One point of concern raised by several interviewees from Africa reflects the need for careful structuring of the events: the hierarchy found in academic contexts, reflected in the dominance of senior (usually male) scientists in presentations and discussions, which stifles participation by the young scientists. In the same vein one group of interviewees also noted that in their event the younger and more senior scientists did not mix easily; this would obstruct one of the important expected outcomes of these events, namely opportunities to connect and be mentored by senior scientists. The need for more female facilitators and keynote or guest speakers as role models was also mentioned in relation to at least two events. "*Manels were the norm*", said one interviewee about one event.

Finding 38. Follow-up in terms of network development was seen as particularly important to sustain the impact of the conference, but "nothing happened". Despite the intent, efforts to establish networks of young scientists who can stay connected after events have come to nothing. Facebook groups came and went. Factors that make such connections a success have to be studied and used to make sure that such initiatives can sustain.

Finding 39. The pandemic offered an opportunity to illustrate the potential for expansion of audiences by moving on-line, but this is not a simple matter. In 2020 a total of 347 persons, 41% of all relevant event participants over the four years, were on-line. There are clear advantages of this development in terms of cost, time-efficiency and the opportunity to have high level speakers who normally would not be able to take the time to commit to a face-to-face event; among others 2020 allowed young scientists, especially those from LDC countries, the rare opportunity to engage with a Nobel Prize winner. Yet interviews with selected participants highlighted the disadvantages this brings - technological challenges, distractions and lack of commitment to be fully part of the meeting, and very little if any opportunities to establish firm connections that start to build empathy and trust. The real value of these meetings for participants therefore has to be taken into account if TWAS moves forward with blended events. Survey results showed that the opportunity to interact with other young fellows is inspirational and motivating, and help form relations that can lead to connections afterwards. This was also recorded as major outcomes of such

events held in the previous phase of Sida support. This is an extremely important benefit which is likely to diminish very substantively in on-line events. Anecdotes during interviews with participants across cohorts confirmed that the 2020 event had much less impact on motivation and building relationships than those of previous years.

Finding 40. TWAS financing for Regional Partners is severely limited, and co-financing of activities is likely to become a significant challenge in a post-COVID-19 world. Senior key informants time and time again during interviews referred to the minor funding obtained from TWAS (for example SAREP, a very active partner, received this year only US$9,000 from TWAS); the increasing difficulty in justifying the very substantive in-kind resources spent for perceived reputational and normative reasons; and similar concerns expressed by co-financiers who are under increasing financial strain in 2021. This is a looming potential threat to at least some of these partnerships, and will require TWAS to be clear about its value proposition for partners under these changing circumstances.

Specific Objective 3. *To build on the foundation and continue to strengthen and enhance the TWAS Science Diplomacy programme by providing increased opportunities for interactions between scientists, policymakers and government representatives, especially in international and transboundary issues with a science basis.*

Finding 41. TWAS has maintained momentum in the Science Diplomacy component by building upon the pioneering effort in the previous phase of Sida support. As detailed in Annex 3, six science diplomacy workshops were held and more than 250 persons received training in science diplomacy since 2017, either in summer courses held in Trieste or in the series of localising regional workshops. The number of applications for these events exceeded the places available by 5-10 times in the case of the summer course in Trieste, showing that their reputation and popularity continue despite the apparent proliferation in science diplomacy courses provided by other organisations. The applications received for the regional courses were slightly less popular, with 'only' 3-4 times the applications compared to the places available, but in each case the large number of applicants could assure good quality submissions. Reviews showed that each year between 25-50% of applications were of the quality that would qualify for participation. The regional science diplomacy workshop planned for 2020 was postponed, but the disruption also provided an opportunity to increase the number of summer course participants by moving on-line, which also increased the number of science diplomacy ambassadors.

Finding 42. TWAS continues to be considered a leading actor in science diplomacy, and new initiatives are helping to cultivate this notion. The Science Diplomacy component continues to have a high profile. This is considered to be the result of its initial innovation in this area during the previous phase of Sida support and its focus on South-to-South interests that are also able to draw in high quality experts from the Global North. This perspective was consistently confirmed by the stakeholders interviewed, and although comparisons with other courses and workshops could not be made, it is also displayed in the high number of applications and the 11

requests for engagement in science diplomacy events organised by others. Innovations in this phase include partnering in a consortium to present the S4D4C (Using Science for/in Diplomacy for Addressing Societal Challenges) Science Diplomacy Workshop held in 2019 in Trieste "in support of European science diplomacy, European Union foreign policy goals and especially the development of solutions for global challenges" – an event that confirms its standing in the Global North. Similarly, just as one example among several, the Organisation for the Prohibition of Chemical Weapons (OPWC), winner of the 2013 Nobel Peace Prize, IAP and TWAS co-hosted in Trieste a high-level workshop on dual-use technologies and responsible research practices in chemical and biological sciences.

Finding 43. It is unclear to what extent increasing communications and devolution to the regions increased awareness of science diplomacy in general. This is in part the result of methodological constraints; this evaluation could not determine the reach of such communications, although 'science diplomacy' was the most tweeted TWAS related hashtag, followed by the related topics science for peace and World Science Forums. Relevant TWAS videos do not garner many views. The Regional Partners had the dissemination of relevant information as one of their tasks, and it is likely that their reach has been able to expand beyond that of TWAS.

Finding 44. The make-up of participation in the science diplomacy offerings indicates that representation was considered, and is more or less in line with TWAS undertakings. Efforts were made to ensure that the TWAS principle of sufficient gender and LDC representation was also reflected in the science diplomacy events. Women made up between 48-62% of participants and, with the exception of participation in 2019, more than 40% were from STLCs. LDC participation was between 13% and 46%. The important review meeting consisted of 40% women and 40% representatives from LDCs. However, several interviewees referred to inadequate focus on women role models in the most visible roles in that and other events – once again highlighting the need for nuanced understanding of the extent to which TWAS initiative is gender-responsive.

Finding 45. Localisation in regions in general maintained quality while increasing the relevance of the offering - although the extent to which this worked is somewhat under dispute. Participants in the science diplomacy alumni review meeting held in November 2020 as well as in interviews during the evaluation gave glowing feedback about the quality and relevance of the course and workshop content. The resource persons were generally judged to be of high quality. Case studies were in some instances adapted to local interests without losing the international focus, an adjustment appreciated by interviewees. In one group interview some criticism was expressed about the dominance of perspectives from the Global North: "*... it was more an imposition of their way of doing - 'what we do is right' …*". There were also suggestions that the local conditions were not well understood in an event that cut across regions, which diminished the value of the workshop for many of the participants: "*Our scientists lack capacities and don't work as a team. .... In many of*

our countries it is difficult to create trust between policymakers and scientists. The dialogue is just not there. This did not come out in the workshop".

Finding 46. Moving on-line presented challenges that have to be considered in future plans. The move to presenting on-line courses in 2020 and 2021 led to similar complaints as highlighted in the findings about the RCYS – a variety of technical challenges, distractions, lack of follow-up and opportunities to develop relationships between participants. The participants who experienced the on-line events were markedly less enthusiastic about what they had experienced than those who participated in face-to-face events.

Finding 47. TWAS priorities and the enthusiasm of participants in TWAS initiated events inspire efforts to create networks that can share and apply new insights, but approaches and contexts are often not conducive enough for success. Records and anecdotes at the 2020 science diplomacy alumni meeting as well as during interviews highlight efforts by inspired participants to share their knowledge and initiate connections with relevant actors once back in their home countries. There are well recorded success stories but also many obstacles, which is why many have been calling for the emerging active network among alumni where collective action generate greater momentum and impact; the Facebook page that have been opened appears to be under-utilised; it did not elicit enthusiasm from interviewees, who noted that "*there is no real conversation"*. Thus, similar to the effect of the Regional Conferences for Young Scientists, the main benefit of this engagement – and it is a major benefit – is the opening of participants' eyes to the larger context within which science can be useful, yet the desire continues for effective networks that help break the isolation of young scientists.

Specific Objective 4. *To increase awareness of TWAS research grants and science diplomacy events, especially in the developing world, with two general impacts: (i) to increase demand for TWAS grants and training, and (ii) to support TWAS's role as an authoritative voice on issues related to science and sustainable development.*

Finding 48. The Public Information Office (PIO) of TWAS has appropriately adopted a synergistic approach - one that runs an impressive, synergistic mesh of up-to-date communication networks trying to harness multiple channels for all communications from TWAS. Yet these have fallen short of its potential for multiple reasons that are not necessarily under the control of the Office. PIO considers Twitter to be a high-level tool for professional relationship building, used to spread the word, communicate with scientists and engage users who are familiar with social media, many of whom are not necessarily TWAS target applicants or users. Email is frequently used by grantees and partners, to get information and get their queries answered, and as an option for direct dissemination to select groups. Facebook is the tool for reaching large numbers of individuals to promote, for example, new grant calls. PIO has also used geographically and otherwise targeted advertisement successfully, but has discontinued this approach due to bureaucratic difficulties with payments. The website is well designed, rich in information, has a low bandwidth

option, and has been rated the preferred information-seeking option by grant recipients. TWAS's newsletter follows the website in importance to users and has been used to engage hundreds of thousands of users. One-on-one communication occurs at different levels (e.g., graduates, researchers, students, grant recipients and science diplomacy) and with different methods. One-on-one communications are hard to quantify or document, but can be remarkably time-consuming: For instance, when an application period is about to end, the PIO webmaster switches for a period of time to an IT support role. While PIO has laudably adopted new technology in use, much automation and analytics potential of especially social media goes untapped, and some fruitful solutions have been discontinued.

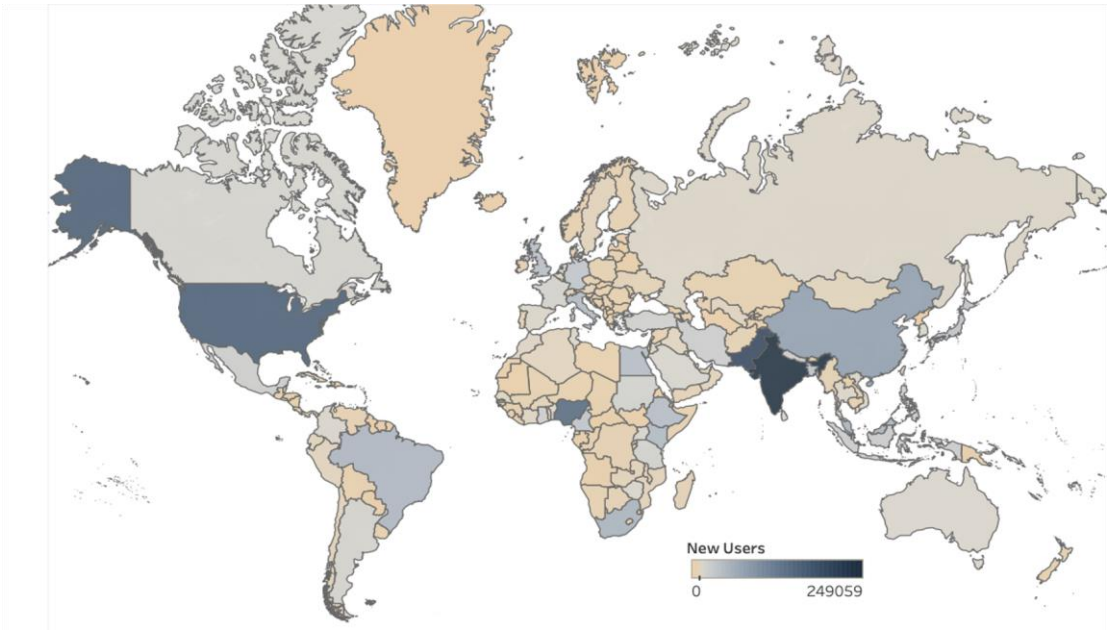
The following findings provide detailed insights into trends and reasons for the present situation.

Finding 49. TWAS grant recipients are conservative consumers of digital media, likely influenced by the often-challenging digital media contexts in LDCs. TWAS maintains a diversified communications strategy that includes website, social media, a newsletter and one-on-one communications at all levels, each with a relatively different audience. Nearly half (44%) of the grantees surveyed had learned about TWAS grants on the web, and one in three (37%) from a friend or a colleague. Just two respondents out of 169 had first heard about TWAS grants from social media (one from Facebook, one from Twitter). Regarding communications, one grantee said, "*TWAS is very formal, and they prefer sending emails*". The website and newsletters for disseminating information were mentioned by almost all interviewed grantees, but social media channels were not. Social media are not actively followed; TWAS Plus is. But practices vary by respondent.

Finding 50. While TWAS has an impressive set of communication channels, well-maintained user lists and frequent website visitors, the growth of users of these channels has slowed down over the last two years. Reasons given for the decline in user growth include: (i) paid campaigns (e.g., Facebook ads) to promote TWAS communications were terminated some years ago; (ii) some programmes that attracted website visitors were stopped and some countries were excluded from the list of eligible countries; and (iii) COVID-19 impacted access to high-speed Internet at universities where many users tend to access such services (mobile use is, however, very common in LDCs).

Finding 51. TWAS maintains a well-designed website with rich information and low bandwidth options in order to serve users in areas with limited connectivity. The majority of users (95%) confirmed that they easily find information through the website. The most visited pages are the pages for PhD positions, fellowships, grants and postdocs - constituting around 40% of the total visitors. Most came from TWAS's target countries: Pakistan (11%), Nigeria (10%), India (10%), USA (6%), China (3%), Italy (3%), followed by Egypt, Cameron, Ethiopia, South Africa, Malaysia, Kenya, Bangladesh and Brazil (all between 2-3%).

Figure 4: Distribution of TWAS website visitors per country



Countries in light brown have fewer than 10,000 visitors.

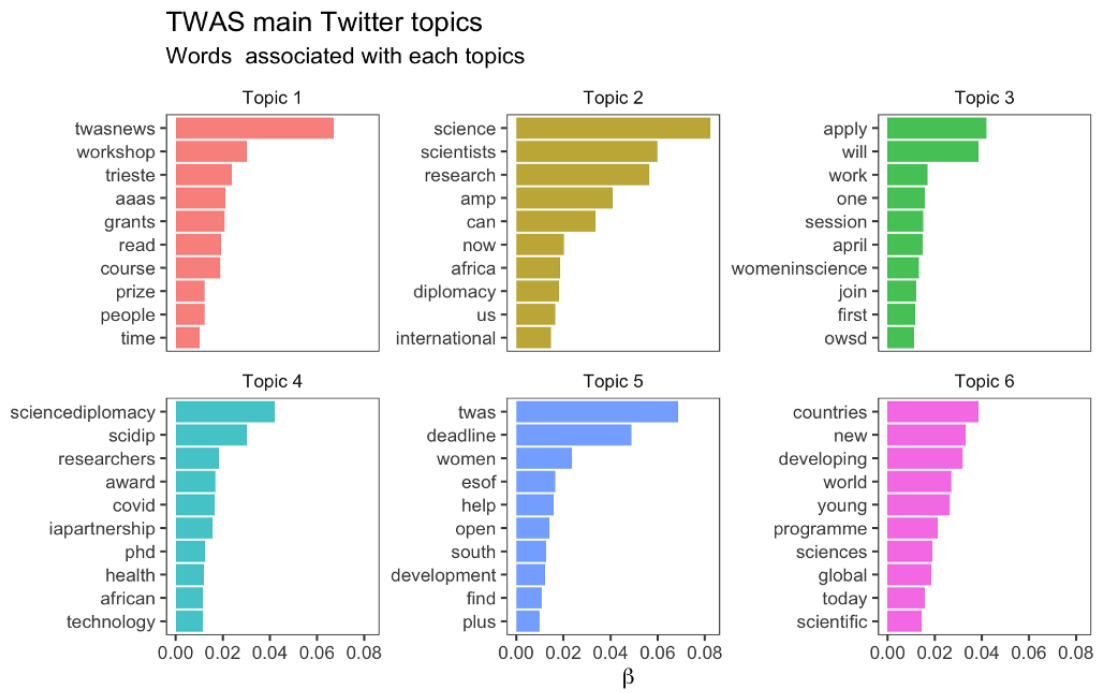
Finding 52. The TWAS website is the most popular and most information-rich of all TWAS communications channels. Over its life span, TWAS website has been visited by around 2 million users (including recurring visitors), with an average of 1,707 daily users. The website visitor rate fluctuates by programme announcements and changes in eligible countries, and has been in slow decline after it peaked some 2–3 year ago. The website's country profile loosely reflects the list of eligible countries, but has traffic from all around the world.

Finding 53. The TWAS Newsletter is a clean and professional looking quarterly magazine with a large subscription base, and sizable readership. During 2015-2019 TWAS has sent a total of 28 newsletters *(campaigns*) through a total of 727,000 emails of which 164,000 were opened. Around half, *i.e.* 78,000 - 10-11% of the subscription base - received a click on the relevant link. The newsletter has received a negligible number of spam reports, which indicates a well-maintained recipient database. The fraction of opened emails declined by an average 11% per year, while the click rate declined by 21% per year on average. Thus, TWAS has a large list of interested and relevant users who are only moderately engaged with the newsletter, but it is encouraging that the overall audience is growing - albeit with decreasing engagement and at a decreasing growth rate. As the data do not include 2020, it is premature to say whether the decline will continue.

Finding 54. Twitter represents the least used information source, and it serves a narrow but apparently important segment of TWAS communications. The account, created at the end of 2009, has around 8,000 followers and around 10,000 tweets. In the past 50 months (the maximum period for analysis allowed by Twitter) most (69%) were re-retweets, 28% organic tweets and 3% replies. Each tweet received an average of 15 retweets and were 'favourited' by an average of two users; mentions

were very low (22 unique mentions), and hashtags were around one thousand. Structural topic modelling identified six main topics that represented the most tweets. Grant- and workshop related (Topic 1), science and research (Topic 2); women in science (Topic 3); science diplomacy (Topic 4); applications and call-related (Topic 5); and young scientists in the Global South (Topic 6) (Figure 5).

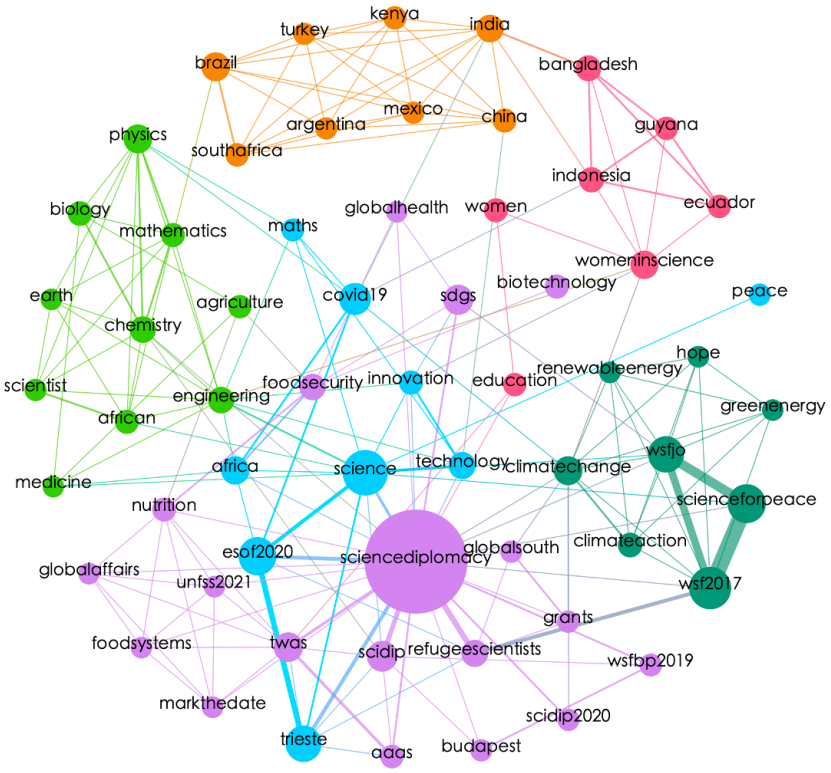
Figure 5: The six main topics in the TWAS Twitter timeline.



Social network analysis of hashtags shows several clusters of hashtags that occurred together. They are thus linked in importance to TWAS and users, and has been the most widely spreading themes. In Figure 6, the hashtags frequently tweeted together are coloured with the same colour, as they represent 'communities'. Science diplomacy (in purple) was the most tweeted hashtag, followed by science for peace and World Science Forums. The analysis of Twitter followers, topics, and networks, as well as survey responses and interviews with PIO show that Twitter is not used to engage users or establish deep connections with the followers but rather to spread the word and establish connections with institutions and prominent scientists, or users. This strategy can be extended: research has shown that engaging and establishing relations with users helps establish connections and spread the message of the institution[9].

[9] Li, T., Berens, G., & de Maertelaere, M. (2013). Corporate Twitter channels: The impact of engagement and informedness on corporate reputation. *International Journal of Electronic Commerce*, *18*(2), 97-126.

Figure 6: Social network analysis of all TWAS hashtags.



Finding 55. The increasing number of communication channels and tasks appears to be stretching PIO's resources. PIO's mandate is wider than the Sida-supported programme components or the communications visible to outsiders, such as Twitter, Facebook, TWAS Plus, Newsletter, Website, TWAS Online Directory of Fellows, and most recently LinkedIn. It also handles annual reports, media contacts and services for events and meetings, domestic and foreign media, printed materials, and even proofreading of important correspondence. Some administrative duties have slowly crept into PIO's remit: When application forms went online with Sida support, many tasks related to web-based applications that previously were handled at the Programme Office are now handled by PIO, who take care of the web services. While examining the balance between workload and staff is not part of our remit, in the case of PIO as well as programme staff this matter might be well worth attending to.

Special Component: Science in Exile

Finding 56. Since the Sida grant was allocated in 2019, good progress has been made in the Science in Exile component, with foundational infrastructure – coalition, strategy, task teams, expertise and (in-kind) resources – set in place before its launch. Key global partners TWAS, ISC and IAP (as 'Science International') together with a variety of at-risk, displaced and refugee scientists and organisations supporting them, other international organisations, universities, research organisations and diaspora groups have coalesced through and around a systematic process to launch an influential initiative committed to shared and effective action. A variety of meetings have been held to determine action, work out credible governance

and management systems, and launch the initiative. At least five concept notes have been developed. [10] Research has been initiated and a website, newsletter, communications strategy and declaration developed to facilitate advocacy and information sharing. Fundraising has been set as priority, while efforts are ongoing to ensure a balance between the participation and priorities of the Global South and Global North. With its launch a first series of public webinars has been crafted.

Finding 57. The need for sensitive handling of matters across the initiative remains. The effort has already been presented with several sensitive issues related to the security of engaged scientists and notions of competition with existing efforts without adding value or meeting early expectations. As far as the Evaluation Team could determine with limited information, the TWAS staff involved are aware of the need to treat these occurrences with great sensitivity and nuance - in this component all concerned will have to be constantly on the alert to ensure that all actions can be defended on pragmatic as well as ethical grounds.

EQ. Has the M&E system delivered robust and useful information that could be used to assess progress towards outcomes and contribute to learning?

Finding 58. TWAS efforts to improve the MEL for learning and accountability in the programme has made it possible to deliver output level indicators upon request, while the focus on outcome level indicators is starting to yield results across the programme ecosystem. The engagement of an external MEL consultant as well as interview comments highlight an intensifying focus among TWAS staff on the generation and use of systematic evidence through evaluative practice. The programme MEL has been expanded to include both qualitative and quantitative data collection and analysis. Particularly welcome steps are the development of a basic theory of change for the science diplomacy component and its use to shape discussions about outcomes during an alumni review meeting in 2020, as well as the use of impact stories and video records. The use of MEL has perhaps not yet quite permeated the TWAS ecosystem. Regional Partners are asked for accurate and measurable deliverables and have to report against targets set in the results framework. But some feel overburdened with administrative responsibilities, and from what we could gather, after action reviews and event assessments in the regions remain limited and/or results not sufficiently documented and available.

Finding 59. Despite well-documented drawbacks, logframes are intended to provide direction and incentives for action. It is therefore of concern that the version used for the programme has several important weaknesses. It incentivises research quantity over quality and thus gives a simplistic notion of how change is brought about; it formulates in some instances actions or outputs as outcomes; and makes unrealistic leaps between outcomes and impacts without sufficient evidence or clarity about the underlying assumptions and the inadequacy of linear reasoning. This,

[10] E.g. on the preservation of scientific knowledge and culture; a mentorship programme, award and fellowship programme for at-risk, displaced and refugee scientists; and a relevant mapping survey.

in addition to the well-known problem that logframes do not allow expectations to be adjusted as contexts and insights change and assumptions are tested. This situation calls for the development of useful systems-informed theories of change that can influence programme design, and that are occasionally revisited and adapted as needed.

Finding 60. Programme data are not always handled with sufficient consistency, and occasional discrepancies and gaps weaken the value and quality of reports. The way in which monitoring data are reported in the Annual Reports from 2017 to 2020 gives the impression that reporting is done for accountability rather than as integral part of management aimed at informing and improving strategy, progress and performance. Among others, the results framework used in each of the Annual Reports differs from that provided in the proposal accepted for support by Sida. In compiling the progress and performance data table in Annex 3 – which is reported against the results framework (logframe) that serves as the basis for indicator monitoring in TWAS – many omissions and discrepancies were apparent. We also found instances where numbers differed between sources without explanation. The logframe contains important issues that are not tracked, such as collaborations, mentoring relations and the "sustainability of research units", yet at times makes claims that might not be quite backed up by systematic evidence.

Finding 61. Insufficient data coupled to un-nuanced analyses can lead to overly simplistic interpretations of results and overclaiming of performance. We noticed for example that in data that cover participants in RCYS events between 2017-2019, two-thirds of the participants (229 of 336) were from four countries where major events were held (Bangladesh, Kenya, Sri Lanka and Sudan); the remainder came from 32 other STLC/LDC countries. Similarly, of the 424 participants from non-STLCS countries, 300 were from the four Regional Partner countries while the remaining 104 came from 46 other countries. This information can stimulate discussion of the benefit (or not) of such concentration of participants, and the implications for where offices are located and events are held. The fact that the programme contribution is only one aspect in the development of a young scientist's career also means that greater rigor is needed in when analysing the credibility and content of the impact stories. Much more work is also needed to ensure that TWAS does not over-claim – especially in this programme – with respect to "preventing brain drain".

Finding 62. The measures of success of communication efforts in the results framework are good examples of indicators that are not meaningful enough. For instance, changes in the list of eligible countries for grants have a significant impact on visitor rates; this means that the number of visits to the website has little meaning as indicator of successful audience reach. For proxies of success in the communications component TWAS uses among others website traffic, subscriptions to the TWAS Plus digital bulletin, and the increase in the TWAS research grantees network. Each has inherent problems. The website traffic can fluctuate for a large number of reasons such as removing a large country with an active potential applicant base from the list of eligible countries. Subscriptions do not give reliable information about active readership. Members of research grantees network may say more about the way

network members are invited and engaged in discussion (or not), than about grantees' active interest in being part of it: some interviewees said they regularly use the network, many others stated they have little to no interest in it, and some said they joined because they were asked to do so.

Finding 63. The present MEL system is still considered to be 'light', but its further expansion might put undue pressure on present staff. Despite the number of indicators required for reporting to TWAS, grantees consider TWAS grants much less time-consuming to report than most other grants. Just a small minority (6%) of survey respondents considered the reporting requirements of the programme to be time-consuming and 'heavy'. This shows the potential of an empowering, more comprehensive MEL system that can remain 'light' yet do more to inform decisions and plans. However, the fairly small complement of programme staff seems to be at the edge of what they can do to ensure that programme management is supported by evidence; the occasional engagement of a MEL consultant has not been enough to maintain momentum in the development of other useful aspects of the system – and this aspect of TWAS operational systems has to be a priority. (We have to reiterate that we did not study the personnel situation in TWAS; our observation is therefore based on limited conversations only.)

7 Findings: Impact

Using available documents, the Evaluation Team retrospectively developed theories of change for the programme overall and for each component (Annex 16) in order to support our analyses of pathways and progress towards impact. These theories of change are intended only for our purposes; they have not been co-created with TWAS staff and other stakeholders, as good ToC development practice for organisational purposes would require. We included them in the set of annexes accompanying this report only to highlight the logic and visual presentation that we used to complement the implicit programme logic and perspectives on change by TWAS staff.

EQ. To what extent has the project or programme generated, or is expected to generate, significant positive or negative, intended or unintended, high level effects that have a good chance to sustain?

Finding 64. Many of the preconditions for success that underlie the change logic (or 'theories of change') of the programme and its components have been (put) in place. This has given the programme a good foundation. The retrospectively developed theories of change have brought to the fore preconditions for success (defined as real change in the systems that TWAS wishes to influence). Important preconditions that have been largely – if not always fully - met include well-functioning TWAS management and implementation teams; well-connected and efficient regional partners who provide in-kind support and can leverage important partnerships and other resources; appropriate strategies per component with sufficient resources, capabilities and infrastructure to make them work; enthusiastic and capable young scientists in STLCs and LDCs identified for support; sensitivity to different contexts, in particular in LDCs; a focus in programme processes on quality as well as quantity; and a shared vision and understanding of what is to be achieved.

Finding 65. The results framework (logframe) – and therefore implementation of especially four of the five components – has not been sufficiently informed by a good understanding of the explicit and especially implicit assumptions about how change was likely to happen. The assumptions formulated in the logframe have not been comprehensive enough, overly simplifying the logic of the pathways to impact and therefore failing to take measures to strengthen the chance of success. For example, providing an opportunity to network does not necessarily lead to spontaneous connections that sustain, especially in the absence of effective ongoing stimulation; putting national or international policy and negotiations experts and scientists together in a science diplomacy workshop does not enable the kind of systems change that is needed to create effective bridges between science and national and international policymaking – although effective action subsequently in-country might help facilitate

systems change, which might then mean that such workshops – if well designed with sufficient follow-up actions – can then be useful catalysts for systems change; and providing equipment grants have to be supported by institutional capabilities or other forms of support to ensure that the equipment continues to be used in the long term, including to strengthen institutional capabilities in research and education.

Finding 66. Some of the expected higher-level outcomes ('impacts') may have been achieved as a result of contributions by the programme or one or more of its components, but assumptions underlying the logic of the programme and its components mean that a different type of evaluation will be needed to make credible assessments and prevent overclaiming of impact. The retrospectively developed theories of change implicit in the programme and each of its components highlight a number of (undocumented) assumptions that indicate gaps in the logic. Based on experience and insights from literature, and the fact that most of the higher level outcomes relate to changes in systems that can only be brought about through collective action, firm statements about the achievement of higher level outcomes and their (adaptive) sustainability will be hard to make. A special non-experimental impact evaluation can bring useful insights to the fore. In the meantime, it will be important to refrain from any claim that ignores the multiple factors that contribute to higher level changes in the development of scientific capacity and, perhaps more importantly, changes that will sustain.

Finding 67. Many outcomes that grantees report are similar to those the programme envisions, but the impact on the institution may be limited. Respondents and interviewees mentioned promotions, increased confidence, feeling of accomplishment, founding new research groups, more and better grant applications, increased research activity in labs, feeling of being visible, and giving the students chance to carry out research. Of survey respondents, 37% reported a promotion that they attributed to the grant (at least partially). For many, TWAS's is the first grant they have won, which has made them proud: "*Being selected means you are doing high quality research!*". Technological capacity improvement is typically not limited to individuals but to groups or departments, and the survey showed that more often than not, it is not used for undergraduate or graduate education.

Finding 68. TWAS grants deliver many of the expected short-term results the project document proposes. Examples are many. The experience of being a PI of an international grant is valuable and unique. It is an important addition to one's CV, and it increases one's visibility. Evidence of increased research activity and research output is plenty, and most of that happens at the international level. Sida is chiefly interested in the research grants programme as a capacity-building rather than research effort—and there is no doubt that it increases certain capacities – even though TWAS contributions have not been traced in detail.

Finding 69. Getting a well-furnished laboratory does not mean there is money to keep it running; sustainability (and thus a systems view of such support) is therefore a major issue in this component. A systems perspective would offer a glimpse of the myriad challenges that grantees face in running a lab in their home institutions. Security related issues that were mentioned included, for instance, fear of theft due to lack of well secured lab space, CCTV cameras, and security staff. Existing network infrastructure was often inadequate, from poor electric grid to Internet connections and even poor road networks: "*My university is young … In my office I didn't even have a single table! We had difficulties with electricity… I asked if I could use solar power, and they agreed! Now I have the best office, within the university, fully functional*". And once the equipment has been procured, some interviewees said their university does not have the budget to maintain the equipment, fix damage to them, or keep them running—not to even mention preventive maintenance and keeping a stock of spare materials or parts to minimise downtime: One interviewee said, "*About 80% of instruments in my university are broken. There's a lack of instruments, maintenance, and expertise to fix them*". "*TWAS people visited our labs and found out that many instruments were not working. This is the main problem. If TWAS gives money only for procurement and doesn't give money for running them, and maintaining them …"* The problems are exacerbated by unavailability of technicians in many countries (for specialised equipment), and poorer warranty terms in LDCs. It is not a task for TWAS to fund each and every element of the system, but it is important to (i) understand which systemic weaknesses can cause the system to fail and therefore render the TWAS investment ineffective, (ii) mitigate risk of systemic failure, and (iii) seek partners that can co-fund other parts of the whole.

Finding 70. The perceived outcomes of regional events are well in line with expectations. Qualitative data in the survey results show that the most common outcomes that respondents mention relate to the outcomes that TWAS had envisaged in designing this component - the chance to learn and to meet other young scientists from their region, breaking the sense of isolation and providing opportunities to form networks - even if these have not yet emerged; opening eyes, inspiring and motivating to continue with their work; building confidence through sharing their knowledge with others, allowing them to see commonalities with other research groups and disciplines. This is supported by quantitative data, which highlights that the strongest impact has been on their motivation as scientists; the fact that 87% agreed or strongly agreed that the conference inspired and motivated them in their scientific work is an important finding, as this relates to building their very important inner strength. Many but not all found someone working in a similar area in their region; nearly 20% of respondents did not see this as a result. In some cases, the events made them aware of the importance of gender-responsive work and gender policies.

Finding 71. The extent to which ongoing or long-term collaboration and especially mentoring have been facilitated by the regional events is unclear and, in some instances, opportunities may even have been stifled. Helping to make connections to peers as well as to senior scientists was frequently mentioned in qualitative survey information, and a reasonable 64% agreed or strongly agreed that the event has helped

them to collaborate with others with similar interests. But interviews showed that 'collaboration' might need to be interpreted in a wide sense, at times merely indicating some connection made. Only ad hoc anecdotes are available to provide additional evidence; to date there has been no systematic analysis of qualitative information. Furthermore, 49% felt that the event had helped them to connect to a senior scientist who has given mentoring support - but again, 'mentoring' may not indicate the systematic process that it normally entails. Of concern is that comments in group interviews confirmed that instead of encouraging women or young people's voices to be heard, hierarchies in the scientific environment in certain cultures led to the stifling of spontaneous interaction also in some regional events. Claims with regard to these aspects therefore have to be treated with caution, and may warrant deeper study during future evaluative efforts as well as preparation of preventative or remedial steps during future events.

Finding 72. Ripple effects as a result of regional events were rarely apparent; many more are found in the science diplomacy component. Ripple effects are important as they can indicate potential for systemic change rather than changes only in a limited number of individuals. Although 43% said that they know of ripple effects resulting from the event, qualitative explanations show that this is a highly overestimated number. Connections and collaborations might lead to further benefits but this is not certain, and follow-up studies will be necessary to determine whether this was indeed the case.

Finding 73. While some positive effects continue to be felt among participants in RCYS events, they may remain largely once-off stimuli without much hope for longer-term, sustained benefit. Two thirds (66%) of survey respondents felt that they continued to benefit from their participation in these events, largely as a result of some continuing networking the sharing of materials and the application of ideas and new knowledge in their work. On the other hand, one third (34%) noted the opposite, blaming no feedback from TWAS after events, no connections made and no opportunities realised from among those offered by other TWAS initiatives. These comments add to the already strong case to be made for the active stimulation of cooperation, networks and any design element that can enhance the potential for ripple effects across a system.

Finding 74. There is a risk of low-quality research outputs as an unintended negative consequence of the support provided by the RG component. This has been discussed in finding 32: The small grants given by TWAS can hardly be expected to yield many publications, while pushing out large numbers of low level publications are not an example to follow. Interviews with grantees confirmed some of these concerns, given the enduring perception that funders in general want to see 'numbers' – that is, many outputs as a result of their support. Limiting the number of reported publications to one only, as we suggested, would encourage meaningful, solid reporting that is not done in a hurry.

Finding 75. Another (negative) unintended consequence is the fact that there is no decisive evidence to confirm that TWAS's support in this programme helps reduce brain drain; over-claiming in this regard has to be avoided. TWAS works with the assumption that by having their work supported in their home country, grant awardees are less inclined to seek opportunities in other countries.[11] But that assumption oversimplifies a complex phenomenon. On the one hand, TWAS has many example cases where their support has enabled career building in grantees' home countries. On the other hand, more respondents in our survey (38%, or 50 out of 170, excluding N/A responses) did plan to use the experience from the grant to apply for jobs outside their country, than did not (34%, or 45 out of 170). Among those were, for instance, recent graduates from the US or Europe who saw their current position as one stage on their way towards postdoctoral studies and career building abroad. Mobility is not straightforwardly negative or positive; it is a complex issue that looks different at the level of individuals, institutions, and nations. What affects some individuals under some circumstances in one way, may affect differently the same people under different circumstances, or different people in the same circumstances. For example, our qualitative information indicates that a good number of the grantees are, in fact, recent PhD graduates from the United States, European Union, Australia, or Japan who have returned to their home countries and home institutions with new skills and knowledge from abroad, and are now exploring further outside possibilities for capacity building and career development. A grants programme will not affect their mobility, or 'brain drain' uniformly.

EQ. Has the programme had any positive or negative effects on gender equality? Could gender mainstreaming have been improved in planning, implementation or follow up?

Finding 76. TWAS takes seriously their aim of increasing the number of female grantees and participants in grants related processes and in regional events. TWAS interviewees mention it often and eagerly, and 80% of grants programme survey respondents felt that TWAS has made clear how their funded projects should promote gender equality or foster inclusion. Reviewers explained that they do not deliberately favour female applicants, but that affirmative action can be taken when a choice has to be made between two equally good applications, one by a female and one by a male. Affirmative action however does not mean a quota system. The same affirmative action applies to applicants from STLC countries. In regional conferences TWAS set expectations that at least 35% should be women. In the 31 RCYS related events for which data were available (Annex 3), more than half of the participants were women in three of the four years, and in all four years exceeding the target of 40%.

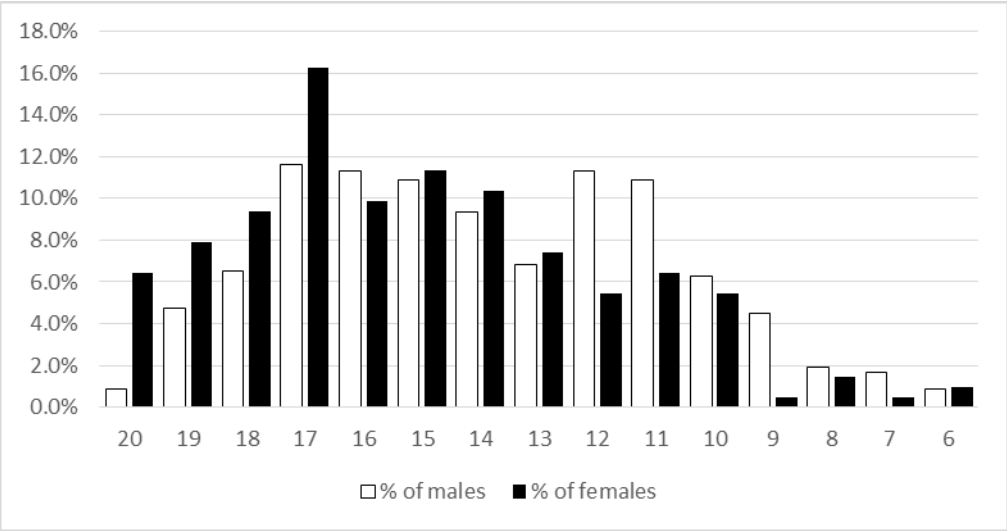
Finding 77. More nuanced data need to be collected to show where TWAS might not be doing enough to use, position or make women scientists visible as role models, for example during events, when soliciting and supporting research unit applications, and in reviewing proposals. Several interviewees who participated in

[11] Sida TWAS Project Document OCR, p.7.

regional events, including science diplomacy courses, mentioned the lack of women speakers and facilitators who can be inspirational role models. On the other hand, in some other cases interviewees noted that a clear effort was made to achieve gender balance also among speakers, facilitators and experts, and there are examples of workshops that had women scientists as keynote speakers – but this does not appear to be sufficiently embedded as principle and hence a consistent approach across events. Similarly, the number of grants awarded to women leading research units is low, likely reflecting the state of play at universities in STLCs or LDCs. The reviewers of grants by TWAS at present consist of 14 women and 31 men, which may bring a certain lens to proposals. These instances are important as they illustrate that TWAS may have to collect more nuanced data if it is to make a strong case for being completely gender-specific[12].

Finding 78. There is a marked difference between male and female applicants' scores in grants reviews. Just one in four (23%) applicants in 2017–2020 were women, but their applications were reviewed much more positively than those of male applicants: Half (50%) of applications by females scored 16 or more points, whereas one in three (35%) applications by males scored equally well. A whopping 6.4% of projects by female applicants received 20/20 points compared to 0.9% of male applicants (Figure 7). That led to a marked improvement in gender balance at the level of high-scoring applications: 30% female, 70% male.

Figure 7: Application review scores, by frequency within gender

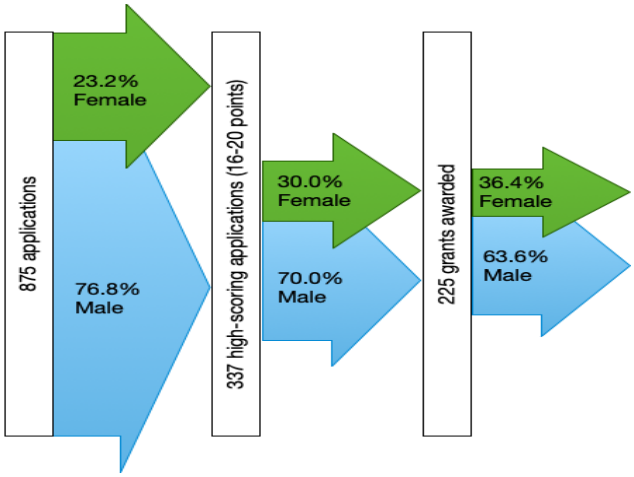


Finding 79. TWAS's strategy has been successful in improving the gender balance in grants programme processes. In the committees that select the grants to be funded, balance is considered, resulting in more than one in three (36%) available grants awarded to female applicants. Figure 8 visualises the gender balance at three stages of application review process. (Note that not all awarded grants were high-scoring ones:

[12] Using the definitions of the WHO Gender Analysis Tools, which is more granular than that used by other UN agencies, including UNESCO.

The lowest score that won a grant was 12—the committees exercise a holistic, context-aware evaluation of applications.) The mean score of female-led applications (15.1/20.0) was more than one full point higher than that of male-led applications (13.8/20.0), as was the mean score of female grant winners (17.3/20.0) compared to their male counterparts (16.3/20.0). The differences are statistically significant ($p<0.001$), and the effect is strong in individual grants, but not group grants. Analysed across the four disciplines, biology and chemistry award more grants to women, in physics the difference is smaller, but in mathematics gender has a weak effect to outcome, favouring males.

Figure 8: Visualisation of the gender balance at three stages of the TWAS grants review process.



Finding 80. TWAS's gender-specific approach appears to extend from grant reviews to project implementation. One grantee applauded how TWAS automatically granted a six-month maternity extension, and was greatly helped by TWAS to enable her visit to the Nepal conference. The grantee's experiences in pregnancy and maternity in the academia were predominantly negative, but with TWAS that experience was very positive. Although TWAS has no written policy for handling maternity leave, they do in the programme have a routine for handling them in a consistent way, with the intention to minimise negative career consequences from having children. Reviewers are also, according to interview information, alerted to look positively at maternity breaks in applicants' CVs. Survey respondents still had a few suggestions to improve the gender responsiveness of the programme: including training on gender mainstreaming, making extra funding available for each additional woman in the team, and removing the age limit for women.

Finding 81. The commitment of the programme to balanced gender representation in what is done is clear, but this focus is less in terms of event content foci and not carried through to the research content. Apart from focusing on gender balance in grant review, allocation and event participation processes, a gender as thematic focus is only to some extent present in some of the event programmes. The programme has not explicated the kinds of gender transformative practices they actively engage in – how their plans and approaches are designed to root out unnecessary gender roles, assumptions and inequalities.

EQ. Has the programme had any positive or negative effects on the environment? Could environment considerations have been improved in planning, implementation or follow-up?

Finding 82. Environment and climate aspects of research are strongly emphasised by Sida and UNESCO, but the programme – or TWAS? - has been slow and superficial in addressing Sida's requests to involve environment and climate issues in their activities. UNESCO's "Towards 2030" Science Report is clear about the need to focus scientific efforts towards climate change, environment, and green initiatives. Sida's 2015–2021 strategy notes the need to stronger adopt an environmental and climate perspective to guide research support in all disciplines. In line with this, Sida reiterated their request to TWAS to consider (i) raising awareness of TWAS staff and TWAS partners to environmental issues, (ii) applying an environment/climate lens on TWAS activities; (iii) improving the environment/climate profile of TWAS; (iv) considering an environmental impact assessment. However, the programme document limits its description of environmental assessment to low-hanging fruits, such as minimising printing, recycling paper, and limiting traveling. The document shows a cavalier attitude in their grant programming towards Sida's concern: "*TWAS Programmes support projects in the basic sciences: by their own nature they do not aim to have harmful or damaging effects on the environment*". While the original TWAS project document presents an example evaluation sheet where environmental awareness is scored 0-5, the evaluation sheet actually applied for TWAS grant evaluations is vague about the environment, does not assign environmental awareness a score, and suggests it should be evaluated only "if relevant"[13]. Instead of rewarding applications for their positioning and planning for positive environmental impact, reviewers were asked to comment "*should they feel that project proposal would or could have a negative environmental impact*"[14]. Several TWAS interviewees acknowledged the low priority placed on environmental considerations, and few ideas about how to raise its priority went beyond the trivial.

[13] Evaluation criteria for the assessment of TWAS research grants (Evaluation Guidelines)

[14] 2019 Annual Report and financial narrative

Finding 83. In practice, many TWAS-funded projects and events do address environmental concerns, discuss local to global climate or environmental issues, and aim at positive environmental impact. While TWAS is not pushing an environmental agenda, grant applicants have shown that even in basic research, one can show potential for immediate, short-term or long-term environmental benefits[15]. It is possible to prioritise research with potential positive environmental benefits. Examples involve, for instance, research on more environment-friendly materials for batteries, antimicrobial resistance in fish, and ways to control pests and insects using natural micro-organisms. Regional Partner events perhaps best demonstrate that climate change in particular, and other environmental issues are a priority for exposure of young scientists.

[15] Stories of Impact: TWAS Research Grants and Science Diplomacy. (Impact Stories_Research Grants)

8 Conclusions

8.1 OVERALL ASSESSMENT

Sida's support to TWAS is based on mutual interests reflected in a long-standing relationship that provides stable financing for a series of well-conceived priorities that support the most science-and-technology disadvantaged countries in the world. These science and technology lagging country (STLC) and Least Developed Country (LDC) contexts present a significant challenge that requires a strong, systems-informed focus on basic individual and institutional capabilities that can sustain even when donor financing is withdrawn. The Sida programme under review has in its five components built on decades-long experience, and enhanced this with some improvements and innovations. This approach has resulted in a programme that has been relevant given local to global interests and developments in the period 2017 -2021 and will continue be so in the context of the new TWAS Sixth Strategic Plan 2021-2025. It has in large part achieved its immediate and short-term objectives, increased efficiencies and delivered on promised outputs as well as on some important outcomes. Overall, given the highly challenging contexts within which it has to effect positive change, in many respects the programme can be considered a good success. However, there are also significant areas for improvement, innovation, caution and careful consideration in a new phase of support.

8.2 RELEVANCE

There are several reasons for the positive assessment of the programme's relevance: (i) basic sciences and basic research are fundamental to advances in application, yet enjoy little support among funders – which together with equipment acquisition and kickstarting early careers create a valuable niche filled by TWAS; (ii) many areas of work supported through the research grants reflect good potential for immediate application in their local and national contexts; (iii) three programme components and most regional events have been designed and implemented with global or regional priorities and situations in mind; and (iv) despite a rather conservative, slowly evolving programme, innovative elements in tune with international developments are occasionally added, such as the new Science in Exile component. (v) The programme designers and implementers are also responsive to evaluative recommendations, lessons learnt through implementation experience, and feedback from participants.

There again, applications and review processes have been affected by a lack of clarity about whether the programme supports basic sciences or basic research or both. And even though the science diplomacy initiative alerts young scientists to the 'bigger picture' for their research, the lack of uptake and opportunities in their own and national

context can be discouraging, especially given that the lack of pursuit to date of the intended alumni network has led to some disillusionment and dissipation of energy, according to persons interviewed during the evaluation. Most importantly perhaps, although through this programme Sida helps ensure that basic science and basic research are supported, which is crucial in STLCs, this type of support does not quite ensure the nurturing of scientists in tune with the urgent and severe challenges facing humanity during this time of multiple interconnected crises.

8.3 COHERENCE

Much can be done to strengthen coherence and synergy within the programme and with others; it has received too little strategic, systematic attention to harness the potential for alignment and cooperation that can lead to long-term synergistic effects. There is some coherence and hence promise in the logic that links the programme components, but little alignment in practice - including between TWAS programmes, and with Sida's other programmes. The five components operate and report in silos, and only some individuals have been able to benefit from more than one type of grant. Impressive collaborations with external partners can be found at headquarters and Regional Partner level, but these tend to be around specific co-organised events - the result of a lack of emphasis in strategy and staff time that is too limited to make the necessary connections. Mobility grants and communications are both under-utilised for this purpose.

Consolidating grants and/or components is possible, but it will change the nature of TWAS's programme logic, and will be desirable only if TWAS and Sida focus on more robust, systems-oriented support to LDCs. The research grants and other allocations are relatively small and scattered, but all have their value, especially in low-income countries where they are making a significant difference at low cost. They have also shown good leverage potential, and it is difficult to find a reason to drop any. Yet the many countries covered by the programme make it difficult to adjust equally well to all continuously-evolving contexts.

8.4 EFFICIENCY

An impressive amount of work has been done to improve programme efficiency - developing a 'light' and useful monitoring, evaluation and learning (MEL) system; moving online, including during the COVID-19 pandemic; streamlining procurement processes; and ensuring standard guidelines for localisation through regional operations count among the most prominent efforts. Transaction costs for small grant allocations remain high, but are offset by localisation in the regions that bring a lot of in-kind support, funding leveraged, and useful connections. Some of the efficiency improvements have come at a cost, but in general the benefits outweigh the disadvantages and remedial actions are possible. Among others, a few quality problems have arisen during the organisation of regional events, while some Regional Partners struggle with rigid guidelines and an administrative overload that do not sufficiently

allow for creativity. Moving events online has been essential, but in future may bring disadvantages that could offset reach and efficiency gains. The most significant facet is the lack of agility in UNESCO's systems and its relationship with TWAS. Although its administration and procurement processes have been important to TWAS's drive for efficiency, UNESCO's internal harmonisation efforts seem to cause double administration that increases inefficiency and places strain on the relationship with TWAS and its financiers.

8.5 EFFECTIVENESS

Good progress has been made towards achievement of programme objectives, but challenges remain if TWAS aims to make any significant difference beyond the level of the individual. Outputs and targets with respect to the range of disciplines and countries, representation from LDC countries, and gender balance have largely been met. In the Research Grants component, applications and hence projects have been improving across a wider set of countries, but there are signs that one of the most important measures of progress in this component is the quality of publications, which has at times been sacrificed for quantity – the result of the neglect of explicit promotion of quality and too much dependence on inappropriate assumptions underlying the programme logic. The linkages with Regional Partners are strong and beneficial although their performance differs; Regional Conferences for Young Scientists and related workshops, including in science diplomacy, have been held, including two organised in LDCs. The extent and type of localisation of content, logistical arrangements and lack of female role models were scattered critiques. In the post-COVID-19 era finding co-financing in regions might be more problematic, while the potential of networks has not yet been sufficiently harnessed to secure the value of once-off scientific events. Science Diplomacy has started to expand through a training the trainer initiative but, interrupted by the pandemic, it still has to take root. The Science in Exile component has made good progress amidst significant sensitivities both in working with scientists in highly challenging contexts, and in efforts to form alliances that are strong and agreeable to the niche where TWAS has positioned itself to make a real difference despite being a newcomer in this space.

8.6 IMPACT

The programme has been developed from a sound basis of experience, and with a foundation of preconditions in place from the start that significantly increased the chance to get desired changes. However, the assumptions that underlie the (implicit) logic of the programme meant that while change at the individual level was likely, the interventions were hardly going to make a difference at systems level – yet this is where TWAS and Sida have been keen to see change. The short-term outcomes stipulated in the logframe have therefore largely been achieved, but without the additional stimulation and coherent and collective actions that can contribute or lead to desired impacts at systems level – or even nuanced data that can help highlight what should be done. For example, individual qualifications and capacities – including in soft skills

such as science diplomacy - of several hundred young scientists have been strengthened, although concentrated in some countries, with in some cases only a few per LDC; the number of publications has increased, but with insufficient attention to what is needed to balance productivity with quality; research facilities have been improved but without sufficient consideration of their sustainability; and multiple fruitful collaborations took place around particular initiatives but without the strategic underpinnings that make for long-term, mutually beneficial collaboration and eventually stronger impacts. The MEL system and especially the (results) framework have been insufficiently conceptualised and detailed to draw attention to such weaknesses in the logic from action to impact – and even if this is due to insufficient staff time given other responsibilities, the indication that this is not a priority is of concern. One potentially significant negative unintended consequence of the type of support provided, and the lack of strong connections with others, is that there is no necessary positive connection to reduce brain drain; the opposite can be true as well, especially as academic mobility is a complex issue that works at and across multiple levels, from individuals to institutions and nations.

8.7 CROSS-CUTTING ISSUES: GENDER AND ENVIRONMENT

The programme reflects a 'gender-specific' rating on the scale of performance[16]. TWAS takes issues of gender seriously, and this is clearly displayed in how programme guidelines are developed and processes are managed. Strong efforts have been made in the three most established programme components to increase the number of female grantees and participants in grants related processes and in regional events. More nuanced data need to be collected to show where TWAS might not be doing enough to use, position or make women scientists visible as role models, for example during events, when soliciting and supporting research unit applications, and in reviewing proposals. There is a marked difference between male and female applicants' scores in grants reviews, and strategies have been successfully implemented to improve the gender balance in grants programme processes. There is also an informal (*i.e.*, not part of a policy) yet said to be systematic approach to making exceptions for women who are at a disadvantage due to maternity leave. There is also room for improvement in the extent of a focus on gender in the content of events and in research projects.

In contrast to gender, the programme – or, it seems, TWAS as a whole - has been slow and superficial in addressing Sida's requests to involve environment and climate issues in their activities. Few projects address environmental concerns, and/or aim at positive environmental impact. There has, however, been a stronger focus in regional events on local to global climate and environmental issues.

[16] Using the definitions of the WHO Gender Analysis Tools.

8.8 KEY FACTORS THAT INFLUENCED PROGRESS AND PERFORMANCE

We summarise here the main factors that have influenced progress and success in this programme. They are not a comprehensive list of influencing factors, but those that have emerged as some of the most important. They were an integral part of our assessment based on a synthesis of information from the document review, interviews and surveys. Depending on whether the influence was positive or negative, they point to areas that in future may require, where possible, cultivation and amplification, or reduction or elimination.

Important positive influences on progress and success:

1. Well-aligned values and commitments as well as strategic guidance by both Sida and TWAS that give direction and facilitate coherent implementation across all components.
2. The empowering style of Sida interactions with the programme, allowing it the freedom to implement and experiment based on occasional input and guidance, but without interference.
3. The credibility and stature that TWAS has built up over a long period, clearly rooted in the interests of the Global South.
4. Leadership, management and staff and especially partners with 'ears to the ground' that enable them to understand current dynamics and trends in science, and the different and evolving contexts from local to global level.
5. The valuable, unique place in research funding for STLCs/LDCs displayed by TWAS grants and other forms of support, as described in interviews and surveys: the handling of procurement, quick decision-making, low bureaucracy, support to young scientists, an option to support MSc students, and the niche of funding basic sciences and basic research.
6. A strong focus on LDCs, with the interests of the Global South at heart, and with the experience of Southern contexts and South-South cooperation.
7. Capable, committed and helpful TWAS programme management and staff, many of whom have been with TWAS for a long time - experienced in programme management and administration, and able to do much with relatively small teams.
8. A range of credible, well-connected and capable Regional Partners in the Global South who display aligned motivations and ways of working.
9. A strong focus on consistent, efficient and effective processes and procedures, including in localisation to the regions.
10. Strong commitment across TWAS to engage with issues of gender, building it explicitly (although not always equally effectively) into processes, guidelines, data collection efforts and reviews.
11. A growing commitment to systematic evidence-based planning, learning, reporting and decision-making.

Important influences that have delayed or obstructed progress and success:

1. Lack of a comprehensive systems lens on science and science capacity development support, and on how change happens and can be made to happen.
2. Insufficient institutional policy and strategic direction around, for example, issues such as the cultivation of coherence and synergy in programming and collaborations, 'decolonisation', environment, and gender in project implementation.
3. Insufficient strategic and systematic engagement with potential or current partners aimed at making the best efforts towards collective action and/or systems change.
4. Working in small teams that may stretch staff to capacity, giving them relatively little time to work strategically.
5. Inadequate engagement with definitions and measurement of 'success', 'failure' and 'quality' in each of the components, across them, and for the programme as a whole.
6. Weaknesses and gaps in the implicit programme logic, and especially in the underlying assumptions that have directed the design and use of the results framework (logframe).
7. Occasional discrepancies and gaps in data as well as siloed data interpretation per component; indicators that are not meaningful enough and with un-nuanced analyses can thus risk overclaiming achievements.

At times diminished sensitivity to the contexts especially in LDCs, for example equipment procurement processes that might not be sufficiently alert to logistical challenges for recipients, and insufficient support to field work for those whose work is not laboratory-focused[17]; lack of attention to ensuring continued use and operation of the equipment purchased; and some support types that require grantees to pay first and later get refunde

[17] TWAS does provide funding for fieldwork where the proposal requires this, and upon request as there is no formal provision made for it. Challenges are experienced to make such requests work, for example when unrealistic amounts are requested.

9 Recommendations

The following main recommendations are derived from our findings and conclusions. They complement but do not necessarily encompass the alerts for potential remedial operational action that are highlighted in the earlier chapters.

9.1 RECOMMENDATION FOR SIDA

Continue and even increase support to TWAS, but with higher expectations and increased joint action around more sustainable financing.

The evaluation of the Sida supported TWAS programme has been largely positive, and much has been achieved over the last five years in some well-crafted niche areas of support. Continued and even enhanced support of (i) current components (with proposed improvements and ongoing adjustment as lessons are learnt), as well as (ii) new initiatives (see next recommendation) and (iii) a light yet more sophisticated and centrally managed monitoring and evaluation system based on well-developed systems-informed theories of change will ensure that experience and changes brought about are built upon with a good chance of success.

However, the world has also entered a new context characterised by multiple interconnected crises. As indicated in the rest of the recommendations, now is the time for funders to support urgent, innovative and progressive action that moves beyond comfort zones and business as usual into spaces that will support the transformations the world needs now, fully displaying the value of science within these. We commend Sida for being a supportive partner without dictating action, but it also means as major funder of science in STLCs and LDCs, Sida is now well positioned to

- support the development of innovations and strategies that can help TWAS to be a stronger leader, convener, catalyst and voice for science, especially in the Global South, and do more to be a bridge between scientists in STLCs and/or LDCs in support of South-South cooperation, as well as with the Global North;
- act as co-convenor to mobilise larger funding to support critical areas of work in science in STLCs and/or LDCs. The programme provides an excellent opportunity for Sida to partner with TWAS and others in rethinking and demonstrating the value of ‘quality’ science for this time in STLCs, and supporting TWAS accordingly as potential leader in developing the type of scientists that the world needs now.

Although new initiatives will increase the level of risk and need for thoughtful experimentation, it can be well managed through building on the experience of TWAS and others, and through good monitoring, evaluation and reflection as part of adaptive management.

9.2 RECOMMENDATIONS FOR TWAS LEADERSHIP, MANAGEMENT AND STAFF

9.2.1 Provide stronger leadership in efforts to work towards systems change and/or transformation in STLC and LDC countries; consider where 'connecting the dots' by thinking and working using a systems lens can add significant value to what is done and achieved.

If brain drain is to be effectively alleviated in STLCs and LDCs, institutions—not single laboratories—have to change; limited short-term support to individuals based in unsupportive, ineffective environments that are not conducive to scientific relevance and excellence are unlikely to bring about the transformative change needed to keep large numbers of good scientists from leaving for better opportunities. TWAS is an apex organisation with a strong footprint in the Global South, especially in STLCs and LDCs. Given the new and urgent demands on science in seeking solutions to complex problems, TWAS has the capacity to assume a stronger leadership in joint efforts to support and develop the scientific endeavour in these countries. TWAS can tap their resources of expertise and partners to develop scientific expertise appropriate for this time. Challenges in STLCs and LDCs and the crises around the world are systemic and mutually reinforcing, and urgent systems-informed action is now needed. The following often interconnected issues are examples:

i. **Strengthen the programme's niche and in the process, pay attention to both the positive and negative influences on success**. Aim to get a better understanding of the ecosystem(s) within which TWAS and this programme operate, including funders and institutions engaged in similar areas of work as well as the local ecosystems of their grantees. Use that to strengthen the programme's niche and value proposition, and cultivate potential collaborations and synergies. Furthermore, some of the most important have been identified in section 8.8. They highlight the diversity in, and interconnectedness of what makes TWAS achieve (or hinders its achievement) through this programme. Maintain or strengthen the positive, and determine how the negative influences can be reduced or eliminated.

ii. **Give authoritative voice to STLC and LDC science**. Benefit from TWAS's unique convening power to draw together (young) scientists and/or institutional leaders to support commissions and studies, make authoritative statements, bring critical issues to light from the perspective of STLCs and/or LDCs, and provide advocacy power for example around open science, scientific quality, payment of overheads to institutions, gender equity across hierarchies, or decolonisation.

iii. **Develop a theory of change for the programme's support to STLCs and LDCs, and connect this to other TWAS programmes for an organisational theory of change in this regard**. Build on what has been learned within the programme, in TWAS, by other financiers and by key institutions to get a better understanding of the logic by which the programme (and TWAS in general)

aims to make a significant difference in these countries. Make clear the assumptions, including systemic success factors, on which impacts depend.

iv. **Balance and link institutional and individual development**. Concentrating funding is often desirable in low-resource environments where institutions and systems have to advance in sync from a low base. Determine how best to tie up with foundations, donors, and funders who provide institutional support, build on what has been achieved and help address those systemic factors that stifle progress of TWAS grantees. Alternatively, identify some high-risk catalytic initiatives with potentially high pay-off that can justify more scattered funding.

v. **Seek (collectively) the best leverage points.** While it is justified to focus on individual capacities in STLCs and LDCs, it will be useful determine whether a stronger focus on systems mapping, evidence syntheses and futures studies may be needed to help determine leverage points in systems for (i) significant, even drastic change (*i.e.*, transformation), or (ii) for removing factors that keep current problems in place. Over time, TWAS has developed an extensive network of partners: Activating and harnessing some of those partnerships may offer the needed leverage for best supporting transformative change in LDC and STLC science during and after the Covid-19 pandemic.

9.2.2 Focus on more strategic and sustainable impacts as well as on financial sustainability through longer-term partnerships and coalitions.

TWAS has impressive connections through the Regional Partners as well as associated organisations with which it engages, usually through once-off events. Given the sense of urgency to mobilise science for the good in STLCs and LDCs, as well as for humanity in general, work with Regional Partners and others to establish two or three longer-term, more strategic partnerships or coalitions to (i) lead key initiatives towards systems change (as indicated in the previous recommendation) and to (ii) align, plan and/or advocate for efforts to strengthen progress towards impact in each of the components. Depending on the context, such efforts could include national academies; organisations where there are already strong historical or current links such as IAP, ISC, GIS and OWSD; and special initiatives in the science ecosystem such as the Science Granting Council Initiative in Africa. The new contexts after the Covid-19 pandemic, and greater realisation of the challenges posed by climate change, will demand collective action towards more drastic change. It will also benefit from the formation of platforms or forums of financiers to mobilise in-kind resources and uncover new sources and modalities of (co)financing; it is likely that government priorities will shift away from anything that is not considered of immediate importance.

9.2.3 Energise emerging networks.

Several networks or opportunities for network formation have been created by TWAS in different programme components. Yet little has been done to give life to the potential they offer. If built on lessons from research and evaluations on what makes such

networks work, they can be used as instruments through which to develop confidence, connections, peer mentoring, exposure and opportunities to get young STLC and LDC scientists' voices heard in international forums and on issues that matter for science today. Purposeful moderation and well-targeted stimulation of discussions in line with the culture of communication within the target group(s) will be essential – even if (small) amounts have to be paid to young scientists who can assist in this regard.

9.2.4 Strengthen organisational policies and regulations in support of gender and the environment.

It is laudable that the programme is open to ad hoc requests, for example of women scientists who require special arrangements as mothers. However, for consistency and improved transparency it will be better to strengthen institutional policies and regulations to enable the programme (and TWAS) to become truly gender-transformative[18]; at present it is at most gender-specific on the WHO scale – or the latter should be stated and accepted as its ambition. It is important, among other things, to ensure that gender is not only clearly spelled out in programme processes and event participation, but also that women are consistently profiled as role models. Appropriate attention needs to be paid to gender (and other social dynamics) in all scientific content, for example in how the results will be used, therefore shaping the research with gender in mind. At present the focus is primarily on targets at programme level.

The environment is much more neglected, and needs to be considered in many more ways than TWAS's organisational green initiatives, such as use of recycled materials or minimising printing. Bigger wins can be achieved from signaling to grant applicants that research that is done with environment in mind is prioritised over research that is not. Currently TWAS grant review process has very well balanced the policy relevance aspect of applications without sacrificing either scientific quality or TWAS's focus on basic research: Similar processes may work for environment-attentive research, too. In line with 9.2.2(ii) above, TWAS can become an important opinion leader and influencer: lead concentrated advocacy efforts, commission studies together with partners, influence policy, and issue authoritative joint statements related to environment and climate.

9.2.5 Strengthen the programme's change logic and monitoring, evaluation and learning approach.

Develop theories of change for the programme and its components (in the next phase) for own empowered use in planning and implementation rather than as a bureaucratic donor demand - but ideally with awareness of the state of the art in this type of effort.[19] Among others, pay special attention to realistic expectations, to avoiding confusing

[18] Using the WHO assessment scale

[19] See for example https://cedilprogramme.org/wp-content/uploads/2018/11/Inception-Paper-No-15-Rick-Davies-Representing-theories-of-change.pdf

outcomes with outputs; to articulating clear preconditions for change and success based on what is known and has emerged to date; and to articulating and monitoring (or testing) the assumptions that underlie the change logic. Avoid the pitfalls pointed out in the evaluation findings in this report around the current logframe. Make sure that there is sufficient triangulation and verification not to over-claim progress, outcomes or impacts, for example through the uncritical use of self-reported impact stories. Continue to develop a light enough monitoring system that enables responsiveness and near-real time adjustment based on sound justification, and include occasional special evaluative or synthesis studies (if possible, together with others working on similar objectives) on, for example, tracing changes or 'impact' on individuals and institutions in specific contexts through longitudinal studies, outcomes harvesting and the like in order to build up sufficient understanding of how to enable significant or even transformational *systems* change in STLCs or LDCs.

9.2.6 Be clear and explicit about what TWAS considers 'quality' research in STLCs and LDCs – including in the context of the ongoing decolonisation debates, and possible refinement to its definition to include i.a. a stronger focus on positioning for use in policy and strategy.

TWAS has involved initiatives like AuthorAid to help instill quality-consciousness in the work of young grantees and research groups, but there is more to do. Research on predatory publishing industry[20] shows that TWAS's main beneficiaries—young, ambitious researchers from LDCs / STLCs—are the most vulnerable to the lure of easy and quick route to publications, and are the most exploited by dishonest players in the field. Aim to continue and strengthen the ongoing initiatives of TWAS on quality-consciousness and predatory publishing, and (ii) change some of the internal processes to advance the view that the young grantees benefit from focusing on quality, not quantity.

The ongoing decolonisation debates, also in the academic and research sectors, highlight the need for TWAS to engage fully with the implications for its grants and other forms of support. This has yet to be done, for example deepening understanding of the narratives that are taken for granted about what science is, why and how research is done and promoted and assessed, and by whom. It should include encouraging efforts to return to a more holistic rather than reductionist approach to the world, and hence to including where appropriate inter- and transdisciplinary practices in what is done.

Furthermore, young scientists today need to understand the connection between science, policy and practice. Therefore, in addition to science diplomacy, a stronger focus on the role of science in policy influencing (or in practice influencing, say in community development) will add significant value despite the challenges in this

[20] Xia, J., Harmon, J. L., Connolly, K. G., Donnelly, R. M., Anderson, M. R., & Howard, H. A. (2015). Who Publishes in "Predatory" Journals? *Journal of the Association for Information Science and Technology*, 66(7): 1406–1417.

regard in STLCs and LDCs. Developing young scientists' capacities both to do relevant science and to communicate it will give them a significant advantage, and enable stronger contributions in their contexts, as long as lessons from other organisations with a longer track record in this regard are taken to heart.

Several organisations that fund science in LDC/STLC contexts have adopted the RQ+ (Research Quality Plus) Framework[21] established by IDRC in order to assess quality of research from a holistic and systems-oriented perspective. While the orientation of RQ+ is towards applied research, it can be selectively applied in, for instance, structuring grant applications so that applicants need to explain how they address specific elements of research quality, such as how the project positions itself for impact or relevance to local context, actionability, capacity strengthening, knowledge accessibility and sharing, and fit with the data environment.

9.2.7 Strengthen communications.

Streamlining of some TWAS processes into online-based processes has demonstrably improved efficiency by removing some bottlenecks in the process, but at the cost of shifting some work from the grants office to the Public Information Office (PIO), whose workload has increased. The office would benefit from capacity building especially related to the largely untapped potential of social media tools and services. TWAS has adopted a synergistic approach and could now move on to exploit the potential their platforms offer. That, however, requires specialisation and additional training. For instance, social media analytics tools enable improved monitoring and managing networks, understanding the network members' habits and demographics, relationship building, and focused targeting.

9.3 SOME ALERTS

In addition to findings with a clear line of sight to evidence confirmed from multiple sources, the Evaluation Team identified a number of weak signals that did not converge into clear findings and recommendations. We present those as 'alerts' that the programme stakeholders need to be aware of should they develop into issues and problems, and they include the following:

i. the programme's relationship with UNESCO is not uncomplicated, with some unresolved tensions;

ii. many developments, like enhanced monitoring and evaluation, appear to increase the already heavy workload of programme staff, and this might require attention in terms of core financing if TWAS is to fulfil its promise in this highly challenging era for science;

iii. lack of a stronger focus on systems poses a reputational risk where equipment procured by TWAS may be unused (or significantly underused) due to severe deficiencies in the institutions where they are delivered.

[21] Details can be obtained from https://www.idrc.ca/en/rqplus.

Annex 1: Terms of Reference

Terms of Reference for the End of Programme Evaluation of Sida's support to The World Academy of Science (TWAS) 2017-2021

Date: 19th March 2021

1. General information

1.1 Introduction

Sida supports research in and by low-income countries to reduce poverty and build sustainable societies. Our partners are bilateral, regional and global research institutions and research-supporting organisations.

Sida supports research of relevance to poverty reduction and sustainable development and assists in building research capacity and systems for research and research-driven innovation in low-income countries. The aim is to save lives and lay the foundation for every person's right and opportunity to live a decent life.

Swedish research support stands on three legs:

- We build research capacity to create sustainable, self-generating research environments.
- We support research in natural, health and social sciences and the humanities, and we support applied science as well as basic research.
- We promote research-driven innovation by supporting local and regional innovation systems.

Local ownership is emphasised in all our research cooperation and research priorities are set by our partners.

Our systems approach implies that we support many features of the research system. Within a university, we support not only research training and research groups, but also other functions to create a productive research culture. Research capacity at universities is linked to research in regional and global organisations.

We support research councils in low-income countries. We coordinate with other funders and mobilise resources for global research calls, promoting the participation of researchers from low-income countries. Some of our partnerships are Grand Challenges Africa, ESSENCE and AI4D.

Our objectives:

- To build research capacity in low-income countries and regions
- To support high-quality research and research-driven innovation of particular relevance to poverty reduction and sustainable development in low-income countries and regions
- We work with our partners to achieve the Sustainable Development Goals. Sida's research cooperation is guided by the government's Strategy for research cooperation and research in development cooperation 2015-2021.

1.2 Evaluation object: Intervention to be evaluated

One organisation is subject to the current evaluation: The World Academy of Science (TWAS). Sida also supports the Organisation for Women in Science in the Developing World (OWSD) which is based at TWAS and are closely linked organisations. OWSD is also supported by IDRC and is being evaluated separately

The World Academy of Science (TWAS)

TWAS is a global science academy based at the International Centre for Theoretical Physics (ICTP) in Trieste, Italy, working to advance science and engineering for sustainable prosperity in the developing world. It is a programme unit of UNESCO. The objective of the support from Sida is to strengthen research in mathematics, physics, chemistry and biology in low income countries.

TWAS also works to increase awareness among governments about the benefits of investing in science and technology. The current support also includes a recently launched project 'Towards a Sustainable Programme for Refugee and Displaced Scientists'

The support given through Sida to TWAS is to enable young researchers to conduct research, build networks and create research groups through TWAS's Research Grant Programme. This programme provides funding for research in biology, chemistry, mathematics and physics of individual researchers and research groups.

The funding is directed towards scientists from 66 countries that have been identified as science and technology lagging countries (STLCs). TWAS is an organisation that is able to capitalise on their large network and international reputation. They have conducted strategies for improved gender balance.. Sida has supported TWAS since 1992, mainly through funding research grants for young scientists.

Current agreement: 67,8 MSEK (2017-2021)

As TWAS and OWSD are closely linked there are many synergies that can be drawn on. The report of the present programme evaluation will inform the programme assessment in 2021 when TWAS and OWSD submit their funding proposal for continued support for 2022-2025.

For further information, the intervention proposal from TWAS is attached as Annex D.

A previous evaluation, in a single exercise by the same evaluator of TWAS, OWSD and GenderInSITE was commissioned by Sida in 2016.

The intervention logic or theory of change of the intervention may be further elaborated by the evaluator in the inception report, if deemed necessary.

2. The assignment

2.1 Evaluation purpose: Intended use and intended users

The primary objective of the evaluation is to provide a rigorous and independent assessment

of TWAS performance for lessons learning purpose. The evaluation will serve as a basis for Sida in deciding on continued cooperation after the end of the current agreement. It shall also provide recommendations to both Sida and TWAS and OWSD on the focus and direction of continued cooperation.

The primary purposes for this evaluation are:

8. Provide a rigorous and independent assessment of the results achieved so far by TWAS.
9. Provide Sida and TWAS with recommendations to upcoming discussions concerning possible continued cooperation (starting 2022).

The evaluation will be used to inform decisions on how project implementation may be adjusted and improved.

- The primary intended users of the evaluation are:
- The project management team of TWAS and OWSD
- Sida's unit for Research Cooperation
- Other donors to TWAS and OWSD

The evaluation is to be designed, conducted and reported to meet the needs of the intended users and tenderers shall elaborate in the tender how this will be ensured during the evaluation process. Other stakeholders that should be kept informed about the evaluation include UNESCO.

TWAS will be responsible for keeping the various stakeholders informed about the evaluation.

2.2 Evaluation scope

The evaluation scope is limited to Sida´s support to TWAS 2017-2021, specifically the four components of which are: research grants, regional partners, science diplomacy, communications.

.However, in order to have a broader view, and if relevant, the evaluators shall assess earlier years.

The primary focus shall not be on the output level; instead the evaluation will assess

the results at the outcome level, and to the extent possible, the impact level. The analysis should be put into a larger context in relation to Sweden's strategy on research cooperation, TWAS strategic direction, as well as the broader context of global and regional trends in research and research training.

If needed, the scope of the evaluation may be further elaborated by the evaluator in the inception report.

2.3 Evaluation objective: Criteria and questions

The objectives of this evaluation is to Evaluate the *quality and relevance, coherence, effectiveness, cost efficiency and impact* of support to TWAS and formulate recommendations as an input to upcoming discussions concerning the preparation of a new phase of the intervention.

The evaluation questions are:

Relevance: Is the intervention doing the right thing?

- To what extent has the intervention objectives and design responded to beneficiaries', global, policies, and priorities?
- To what extent have lessons learned from what works well and less well been used to improve and adjust intervention implementation?
- Limited to the activities funded by Sida, is there a risk that too many activities are undertaken, or is it an opportunity?

Coherence: How well does the intervention fit?

- How compatible has the intervention been with other interventions in the sector or organisation where it is being implemented?

Effectiveness: Is the intervention achieving its objectives?

- To what extent has the intervention achieved, or is expected to achieve, its objectives, and its results, including any differential results across groups?
- Have the M&E system delivered robust and useful information that could be used to assess progress towards outcomes and contribute to learning?

Efficiency: How well are resources being used?

- To what extent has the intervention delivered, or is likely to deliver, results in an economic and timely way?

Impact: What difference does the intervention make?

- To what extent has the project or programme generated, or is expected to generate, significant positive or negative, intended or unintended, high-level effects?
- Has the project had any positive or negative effects on gender equality? Could gender mainstreaming have been improved in planning, implementation or follow up?
- Has the project had any positive or negative effects on the environment? Could environment considerations have been improved in planning, implementation or follow up?

Questions are expected to be developed in the tender by the tenderer and further refined during the inception phase of the evaluation.

2.4 Evaluation approach and methods

It is expected that the evaluator describes and justifies an appropriate evaluation approach/methodology and methods for data collection in the tender. The evaluation design, methodology and methods for data collection and analysis are expected to be fully developed and presented in the inception report. Given the situation with Covid-19, innovative and flexible approaches/methodologies and methods for remote data collection should be suggested when appropriate and the risk of doing harm managed.

The evaluation process is expected to be a learning opportunity for TWAS and therefore the proposed approach should serve this purpose as well. The consultant should suggest innovative and flexible methods of ICT and remote data collection, and/or increased local participation, led by the 'do no harm' principle. It is important and necessary to adapt the scope, methods and questions to each specific case, given the pandemic situation.

A *gender-responsive* approach/methodology, methods, tools and data analysis techniques should be used[22].

Sida's approach to evaluation is *utilisation-focused*, which means the evaluator should facilitate the *entire evaluation process* with careful consideration of how everything that is done will enhance the use of the evaluation. It is therefore expected that the evaluators, in their tender, present i) how intended users are to participate in and contribute to the evaluation process and ii) methodology and methods for data

[22] See for example UNEG United Nations Evaluation Group (2014) Integrating Human Rights and Gender Equality in Evaluations http://uneval.org/document/detail/1616

collection that create space for reflection, discussion and learning between the intended users of the evaluation.

In cases where sensitive or confidential issues are to be addressed in the evaluation, evaluators should ensure an evaluation design that do not put informants and stakeholders at risk during the data collection phase or the dissemination phase.

2.5 Organisation of evaluation management

This evaluation is commissioned by Sida´s unit for research cooperation. The intended users are the project management teams of TWAS and OWSD, Sida's unit for Research Cooperation and other donors to TWAS and OWSD.

The intended users of the evaluation form a steering group, which has contributed to and agreed on the ToR for this evaluation. The steering group is a decision-making body. It will approve the inception report and the final report of the evaluation. The steering group will participate in the start-up meeting of the evaluation, as well as in the debriefing/validation workshop where preliminary findings and conclusions are discussed.

2.6 Evaluation quality

All Sida's evaluations shall conform to OECD/DAC's Quality Standards for Development Evaluation[23]. The evaluators shall use the Sida OECD/DAC Glossary of Key Terms in Evaluation[24] and the OECD/DAC Better Criteria for Better Evaluation[25]. The Evaluation[26]. The evaluators shall specify how quality assurance will be handled by them during the evaluation process.

2.7 Time schedule and deliverables

It is expected that a time and work plan is presented in the tender and further detailed in the inception report. Given the situation with Covid-19, the time and work plan must allow flexibility in implementation. The evaluation shall be carried out 12 April to 25 June 2021. The timing of any field visits, surveys and interviews need to be settled by the evaluator in dialogue with the main stakeholders during the inception phase.

The table below lists key deliverables for the evaluation process. Alternative deadlines for deliverables may be suggested by the consultant and negotiated during the inception phase.

Deliverables	Participants	Deadlines

[23] OECD/DAC (2010) Quality Standards for Development Evaluation.

[24] Sida OECD/DAC (2014) Glossary of Key Terms in Evaluation and Results Based Management.

[25] OECD/DAC (2019) Better Criteria for Better Evaluation: Revised Evaluation Criteria Definitions and Principles for Use.

[26] OECD/DAC (2019) Better Criteria for Better Evaluation: Revised Evaluation Criteria Definitions and Principles for Use.

1. Start-up meeting VIRTUAL	Evaluators, Sida, TWAS	Tentative 12 April 2021
2. Draft inception report		Tentative 26 April 2021
3. Inception meeting Virtual	Evaluators, Sida, TWAS,	Tentative 29 April 2021
4. Comments from intended users to evaluators		Tentative 7 May 2021
5. Data collection, analysis, report writing and quality assurance	Evaluators	21 May 2021
6. Debriefing/validation workshop (meeting)	Evaluators, Sida, TWAS and	24 May 2021
7. Draft evaluation report		Tentative 4 June 2021
8. Comments from intended users to evaluators		Tentative 11 June 2021
9. Final evaluation report		25 June2021
10. Seminar VIRTUAL	Evaluators, Sida, TWAS	Tentative 9 July 2021

The inception report will form the basis for the continued evaluation process and shall be approved by Sida before the evaluation proceeds to implementation. The inception report should be written in English and cover evaluability issues and interpretations of evaluation questions, present the evaluation approach/methodology *including how a utilsation-focused and gender-responsive approach will be ensured*, methods for data collection and analysis as well as the full evaluation design, including an *evaluation matrix* and a *stakeholder mapping/analysis*. A clear distinction between the evaluation approach/methodology and methods for data collection shall be made. All limitations to the methodology and methods shall be made explicit and the consequences of these limitations discussed.

A specific time and work plan, including number of hours/working days for each team member, for the remainder of the evaluation should be presented. The time plan shall allow space for reflection and learning between the intended users of the evaluation.

The final report shall be written in English and be professionally proof read. The final report should have clear structure and follow the layout format of Sida's template för decentralised evaluations (see Annex C). The executive summary should be maximum 3 pages.

The report shall clearly and in detail describe the evaluation approach/methodology and methods for data collection and analysis and make a clear distinction between the two. The report shall describe how the utilization-focused approach has been implemented i.e. how intended users have participated in and contributed to the evaluation process and how methodology and methods for data collection have created space for reflection, discussion and learning between the intended users. Furthermore, the gender-responsive approach shall be described and reflected in the findings,

conclusions and recommendations along with other identified and relevant cross-utting issues. Limitations to the methodology and methods and the consequences of these limitations for findings and conclusions shall be described.

Evaluation findings shall flow logically from the data, showing a clear line of evidence to support the conclusions. Conclusions should be substantiated by findings and analysis. Evaluation questions shall be clearly stated and answered in the executive summary and in the conclusions. Recommendations and lessons learned should flow logically from conclusions and be specific, directed to relevant intended users and categorised as a short-term, medium-term and long-term.

The report should be no more than 35 pages excluding annexes. If the methods section is extensive, it could be placed in an annex to the report. Annexes shall always include the Terms of Reference, the Inception Report, the stakeholder mapping/analysis and the Evaluation Matrix. Lists of key informants/interviewees shall only include personal data if deemed relevant (i.e. when it is contributing to the credibility of the evaluation) based on a case based assessment by the evaluator and the commissioning unit/embassy. The inclusion of personal data in the report must always be based on a written consent.

The evaluator shall adhere to the Sida OECD/DAC Glossary of Key Terms in Evaluation[27].

The evaluator shall, upon approval by Sida of the final report, insert the report into Sida's template för decentralised evaluations (see Annex C) and submit it to Nordic Morning (in pdf-format) for publication and release in the Sida publication database. The order is placed by sending the approved report to Nordic Morning (sida@atta45.se), with a copy to the responsible Sida Programme Officer as well as Sida's Evaluation Unit (evaluation@sida.se). Write "Sida decentralised evaluations" in the email subject field. The following information must always be included in the order to Nordic Morning:

1. The name of the consulting company.
2. The full evaluation title.
3. The invoice reference "ZZ980601".
4. Type of allocation: "sakanslag".
5. Type of order: "digital publicering/publikationsdatabas.

2.8 Evaluation team qualification

[Sida's framework agreement for evaluation services stipulates that a 'core team member' (i.e. a senior consultant with high level of evaluation competence) shall lead the evaluation team. The following mandatory qualifications are already specified for each consultant level in the framework agreement: Academic background, evaluation skills, number of years of working experience and English language skills. Include only additional (if any) specific qualifications that are required within the team, and not

[27] Sida OECD/DAC (2014) Glossary of Key Terms in Evaluation and Results Based Management.

specified at an individual level. Additional qualifications may vary depending on the assignment, but might include local knowledge, subject matter expertise, language skills etc.]

In addition to the qualifications already stated in the framework agreement for evaluation services, the evaluation team shall include the following competencies a team member with a PhD or documented experience of research.

It is desirable that the evaluation team includes the following competencies · Good understanding of research systems and academic systems, including knowledge of scientific method, academic education chain, scientific publication, doctoral student guidance, building of research groups, research ethics, peer review, research funding and collaboration with the surrounding society .

A CV for each team member shall be included in the call-off response. It should contain a full description of relevant qualifications and professional work experience.

It is important that the competencies of the individual team members are complimentary. It is highly recommended that local evaluation consultants are included in the team, as they often have contextual knowledge that is of great value to the evaluation. In addition, and in a situation with Covid-19, the inclusion of local evaluators may also enhance the understanding of feasible ways to conduct the evaluation

The evaluators must be independent from the evaluation object and evaluated activities, and have no stake in the outcome of the evaluation.

Please note that in the tender, the tenderers must propose a team leader that takes part in the evaluation by at least 30% of the total evaluation team time including core team members, specialists and all support functions, but excluding time for the quality assurance expert.

2.9 Financial and human resources

The maximum budget amount available for the evaluation is 700,000 SEK.

The contact person at Sida/Swedish Embassy is Eva Ohlsson, unit for research cooperation, Department for Partnerships and Innovation. The contact person should be consulted if any problems arise during the evaluation process.

Relevant Sida documentation will be provided by Eva Ohlsson, unit for research cooperation, Department for Partnerships and Innovation.

Relevant TWAS documentation will be provided by Max Paoli, TWAS. Max Paoli mpaoli@twas.org

Contact details to TWAS supported researchers and institutions will be provided by Max Paoli mpaoli@twas.org

The evaluatior will be rquired to arrange all logistics for example booking interviews etc.

3. Annexes

Annex A: List of key documentation

Agreement and Application
Grant Agreement Sida- UNESCO for TWAS
Building Research Capacity in the Basic Sciences in Developing Countries, 2017 - 2021
Steering Group meetings
Minutes from Steering Committee meetings
Minutes from Sida-TWAS Review meetings
Annual Review Meeting with Sida Agreed minutes
2018
2019
2020
2021
Annual Narrative and Financial reports
Annual Report on Activities in 2017
Annual Repon on Activities in 2018
Annual Report on Activities in 2019
Annual Report on Activities in 2020
Former evaluations
SIPU Evaluation of Sida Support to TWAS, OWSD and GIS carried out by Mr. Stein-Erik Kruse and
Ms. Anamaria Golemac Powell between April and July 2016.
Other relevant TWAS publications
- TWAS Strategic Plan SP6 2021-25
Sida strategies
- Sida's strategy for research cooperation and research in development cooperation 2015-2021.

Annex B: Data sheet on the evaluation object

Information on the evaluation object (i.e. intervention)

Title of the evaluation object	The World Academy of Sciences, TWAS 2017-2021
ID no. in PLANIt	10125
Dox no./Archive case no.	16/000854
Activity period (if applicable)	2017-05-01 to 2021-12-31
Agreed budget (if applicable)	67,8MSEK

Main sector[28]	Research
Name and type of implementing organisation[29]	TWAS
Aid type[30]	Project
Swedish strategy	Research cooperation

Information on the evaluation assignment	
Commissioning unit	Unit for research cooperation
Contact person at unit	Eva Ohlsson
Timing of evaluation (mid-term, end-of-programme, ex-post, or other)	End-of-programme
ID no. in PLANIt (if other than above).	tbd

Annex C: Decentralised evaluation report template

[This format is a requirement for publication under the "Sida Decentralised Evaluations" report series in Sida's publication database and can be found on Sida's Inside, under Guidelines & Support/Contribution Management/ Evaluation/ Implementing.]

Annex D: Project/Programme document

[28] Choose from Sida's twelve main sectors: education; research; democracy, human rights and gender equality; health; conflict, peace and security; humanitarian aid; sustainable infrastructure and services; market development; environment; agriculture and forestry; budget support; or other (e.g. multi-sector).

[29] Choose from the five OECD/DAC-categories: public sector institutions; NGO or civil society; public-private partnerships and networks; multilateral organisations; and other (e.g. universities, consultancy firms).

[30] Choose from the eight OECD/DAC-categories: budget/sector support; core contributions/pooled funds; project type; experts/technical assistance; scholarships/student costs in donor countries; debt relief; admin costs not included elsewhere; and other in-donor expenditures.]

Annex 2: Sida-funded TWAS Programme Components

Programme objectives with initiatives or funding modalities that constitute each of the Sida-funded TWAS programme components.

Specific Objective 1: Research Grants

To increase, within the next 5 years, the production and use of high-quality research of relevance to target countries, conducted by individual scientists, groups and consortia.

Component 1 Initiatives

1.1 Competitive research grants for individual young scientists, as well as

1.2 Competitive research grants for research units, *i.e.* groups led by scientists with a proven track record - giving selected candidates access to new scientific equipment, supplies and literature as well as to publishing in open access journals, and to international conferences, with support also to Masters students in the research groups.

1.3 TWAS Research Grantees Network, linking grantees to provide opportunities for sharing and collaboration

1.4 Conferences for TWAS Research Grantees, providing training in a wide range of soft skills and also exposure to opportunities to link young and more experienced researchers in conversation and for potential collaboration.

Specific Objective 2: Regional Partners

To support and increase, within the next 5 years, the activities of the TWAS Regional Partners by providing networking links and opportunities for young scientists and others both within the region and beyond.

Component 2 Initiatives

2.1 Development of a tailored action plan per region

2.2 Organisation of at least one Regional Conference for Young Scientists (RCYS) to discuss issues that matter for countries in that region, with evaluations of the events.

Specific Objective 3: Science Diplomacy

To build, within 5 years, a sustainable TWAS science diplomacy programme, supported by a series of partners from the Global South and North, and with an annual programme of work aimed at enhancing the links between scientists and government representatives.

Component 3 Initiatives
3.1 Annual summer course in science diplomacy; expansion of the TWAS science diplomacy network[31]
3.2 Annual regional course in science diplomacy; expansion of the TWAS science diplomacy network[32]
3.3 Review conference for course alumni, 1-5 year after their participation

Specific Objective 4: Outreach and Communication

To improve the outreach and impact and hence the possibility of reaching the objectives of the TWAS programmes.

Component 4 Initiatives
4.1 Bimonthly TWAS Plus digital bulletin; TWAS Newsletter and TWAS Annual Report
4.2 TWAS presence on social media (Twitter, Facebook) in LDC countries[33]
4.3 Dissemination of TWAS programme, grants and science diplomacy information
4.4 Twice annual meetings with Regional Partners to maintain identity
4.5 Development and maintenance of on-line application system

Additional Objective 5: Science in Exile

To gather knowledge and lay the groundwork for much more cohesive and coordinated national, regional and international responses to the issue of refugee and displaced scientists that would enable (the expected growing number of) affected individuals to be assisted smoothly and effectively in a follow-on phase of the initiative.

Component 5 Initiatives
5.1 Strategy and roadmap to raise awareness
5.2 Website as information repository
5.3 Network of organisations helping refugee and displaced scientists

[31] Written outputs after the course envisaged in the programme proposal have not been a focus during its execution.

[32] Post-course activities in science diplomacy envisaged in the programme proposal have not been a focus during its execution.

[33] The number of LDCs has varied from 46 to 48 over the period of support.

Cross-cutting Themes

C1. Gender equality / mainstreaming; gender balance
C2. The environment
C3. Rights based perspective: non-discrimination, participation, transparency, openness, accountability ('geographic distribution', also noted, might resort under this theme)

Annex 3: Activities and Outputs of TWAS Programme

The table below indicates the results in each of the Sida-funded TWAS programme components against the targets set in project document logframe, and/or reflects results reported by TWAS in Annual Reports or in personal communication with the Evaluation Team.

Components	Results/Performance Indicator(s)[34]	2017	2018	2019	2020	2021	Target per year
Component 1: Research Grants	Number orders equipment, consumables, literature	161	109	110	92[35]	-	Not in logframe
	Number of scientists registered and linked in TWAS Research Grantees Network/Number of updates by users[36]	-	-	-	318/-	-	No target
	Grant recipients – Individual…	48	33	30	34	-	15 approx.
	…of which female (%)	40	42	40	50	-	70%
	…of which from LDCs (%)	58	58	73	59	-	70%
	Grant recipients – Research Units…	22	19	18	22	-	10 approx.
	…of which female (%)	27	16	28	27	-	70%

[34] The following targets were unclear or not reported on in the Annual Reports, and were therefore excluded from the table:

- Number of people attending 'Paolo Budinich Science Diplomacy Lecture'; Amount of press/media coverage of the event (Component 3)
- Number of updates by users of user entry in TWAS Research Grantees Network (Component 1)
- Successful launch for each programme under TWAS Online Forms (Component 4)
- Annual number of TWAS Online Forms users (Component 4)
- Completion of unified database system that is fully functional and effectively linked to TWAS Online Forms system (Component 4)
- Number of overall visits and sessions to www.TWAS.org (Component 4)

[35] Procurement ongoing for 2020 awards.

[36] Launched in February 2020, sign up rate 70%.

	…of which from LDCs (%)	64	64	72	73	-	70%
	Final reports	59	31	-	-	-	Not in logframe
	Research publications Individual	54	22	11	1	-	One per grant min
	Research publications Group	67	33	4	7	-	One per grant min
	Number of conference participations by TWAS grantees (individual and group)	59	12	2	-	-	No target
	MSc registered	76	46	37	53	-	No target
	Conferences for Research Grantees	-	1	1	-	-	No target
	TWAS Research Grantees Conference participants…	-	29	37	-	-	No target
	…of which female (%)	-	49	32	-	-	Not in logframe
	…of which from LDCs	-	45	-	-	-	Not in logframe
Component 2: Regional Partners	Number of regional partners/staff	5/2	5/2	5/2	5/2	5/2	Not in logframe
	Number of Regional Conference Young Scientists events	8	6	8	9	-	At least one per office
	Number of Young Scientists Regional Conference participants…	124	198	168	167	-	Not in logframe
	…of which female (%)	45	65	53	50	-	40%
	…of which from STLCs/ LDCs (%)	100/44	60/50	-/66	-/65	-	No target
Component 3: Science Diplomacy	Number of partners/sponsors	11	3	2	1	4	No target
	Number of diplomacy workshops	1	2	2	1	1	Not in logframe
	Amount of co-funding leveraged by TWAS Regional Offices, summer course, USD	-	10,000	10,000	14,000	-	No target
	Amount of co-funding leveraged by TWAS Regional Offices, regional workshop, USD	-	30,000	21,000	-	-	No target
	Number of applications received for the summer course…	179	328	123	197	-	No target
	…of which quality applications (%)	42	34	50	37	-	No target
	…of which applications offering to cover part or all costs (%)	20	5	30	-	-	No target
	Number of participants to receive training in the summer course…	26	24	25	75	-	Not in logframe
	…of which from developing countries	20	21	17	70	-	25+

	…of which female (%)	62	50	48	60	-	No target
	…of which from STLCs (%)	31	46	28	43	-	No target
	…of which LDCs (%)	-	29	8	24	-	No target
	Number of applications received for the regional workshop…	-	-	72	126[37]	-	Not in logframe
	…of which quality applications (%)	-	-	25	31	-	Not in logframe
	Number of participants to receive training in regional workshop…	-	32	23	-	56[38]	20+/Not in logframe
	…of which female (%)	-	50	57	-	-	No target
	…of which from STLCs (%)	-	66	22	-	-	No target
	…of which LDCs (%)	-	44	13	-	-	No target
	Number of science diplomacy ambassadors (summer course + regional workshop*)	4	4+6*	11+2*	21	5*	Min 2
	Number of science diplomacy fellowships (summer course + regional workshop*)	10	7+20*	6+21*	42	48*	Min 10
	Number of regional invitations to TWAS to engage in science diplomacy events organised by other parties	1	6	2	2	-	No target
	Number of science-diplomacy-related papers, reports, blogs etc. produced by participants post-meeting/Amount of press/media coverage of events	1	8	15	12	-	No target
	Number of 'alumni' from previous courses participate in a review conference…	-	-	-	30	-	40-50
	…of which female participants (%)	-	-	-	40	-	No target
	…of which participants from STLCs/LDCs	-	-	-	60/40	-	No target
	'Paolo Budinich Science Diplomacy Lecture'; number of views of video loaded on YouTube	-	-	-	-	680	No target
Component 4: Outreach and Communications	Number of applications for TWAS summer course/annual workshop (Science Diplomacy?)	179	328/-	123/72	197/126	-	No target
	Number of applications for TWAS research grants	220	254	297	356	432	No target
	Traffic to Research Grants webpages (total page views/unique visitors) (%)	-5/-6	+7/+3	+33/+33	-12/-10	-	Not in logframe

[37] Rescheduled to March 2021.

[38] This number reflects only the first workshop; the other three still have to take place.

	Traffic to Science Diplomacy webpages (total page views /sessions/users) (%)	+1/+4/+3	+37/+33/ +43	-11/-10/-14	-	-	No target
	Social media: growth of LDC followers on Facebook (%)	+11	+14	+9	+5	-	Not in logframe
	Growth of subscriptions to TWAS Plus digital bulletin (%)	+44	+31	+12	+7	-	No target
Additional Component 5: Science in Exile	Documents developed[39]	-	-	-	4	1-	First appears in logframe in 2020 Annual Report
	Number of network building workshops and engagement meetings	-	-	1	1	-	
	Number of people involved in the engagement meetings	-	-	25	28	-[40]	
	Other outputs under development[41]	-	-	-	-	-	

[39] Desk review, strategy with vision and mission statements, website/portal concept note, advocacy plan.

[40] Workshop held on 1 October 2020: 28; Call January 2021: 58; Workshop 2 March/April 2021: 70; Working Groups January-March 2021: 43; Task Teams April-May 2021: 51 registered to date (8 May 2021).

[41] Under development: database of network participants, podcasts, website, webinar series, sustainability and fundraising strategy.

Annex 4: Financial commitments of TWAS programme

Programme expenditure per each of the Sida funded TWAS programme components, 2017-2021.

Component	Total	2017	2018	2019	2020+2021 forecast
Research Grants	5,470,216	1,386,403	957,893	862,638	2,263,280
Regional Partners	459,877	79,227	76,959	110,384	193,306
Science Diplomacy	206,965	17,820	35,859	32,756	120,529
Communications	73,123	9,829	19,518	7,091	36,684
Science in Exile	261,224	-	-	-	261,224
Monitoring	133,189	-	-	51,570	81,619
Staff and Office Space	1,236,373	240,638	262,585	190,959	542,190

Annex 5: Evaluation Matrix

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
RELEVANCE: Are we doing the right thing?			
1. To what extent have the intervention objectives and design responded to (i) intended beneficiaries' priorities, (ii) regional and (iii) global policy priorities? Are they still relevant for this time?	1.1. Congruence between rationale for each programme component and how selected projects have positioned themselves in terms of (i) their countries' national priorities; (ii) regional priorities; and (iii) key global policy priorities (e.g., SDGs, Paris Agreement).	▪ Document review ▪ Key informant interviews (KIIs) ▪ Portfolio analysis	▪ Rapid literature scan ▪ Project proposals, project final reports ▪ Programme documentation ▪ Intended beneficiaries ▪ Regional partners
	1.2 Congruence between each programme component (objective) and type/themes of activities supported	▪ Document review ▪ KIIs ▪ Portfolio analysis	▪ Component documentation ▪ Theories of change ▪ Annual reports ▪ Component heads/ implementers ▪ (Regional) partners ▪ Project proposals
	1.3 Extent to which policy priorities have been (i) recognised in the grant call, rationale for grant selection criteria, and selection processes; and (ii) accounted for in these processes	▪ Document review ▪ KIIs	▪ Proposal review criteria, selected proposals and their reviews ▪ Minutes of grant review meetings ▪ Reviewers ▪ Statistics of applications submitted, review scores, and non-recipients

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
	1.4 Per component, intended beneficiaries' level of satisfaction that priority needs have been addressed	▪ Document review ▪ Grantee / course participant interviews ▪ Focused survey ▪ Group discussions	▪ Final reports ▪ Existing evaluations of activities ▪ Grantees & course participants
	1.5 Perceived relevance of each programme component to their intended users	▪ Focused survey	▪ Grantees & course participants / Intended beneficiaries
	1.6 Fit of each component and its interventions with the post-COVID-19, Anthropocene era global (science) landscape	▪ Literature review ▪ Document review ▪ Group discussions	▪ Programme documentation ▪ Rapid literature scan ▪ Programme governance ▪ Programme management & component heads, implementers & partners
2. To what extent have lessons learned from what works well and less well been used to improve and adjust intervention implementation?	2.1 Extent to which adjustments have been made in response to evaluation recommendations (with consideration of management response)	▪ Document review ▪ KIIs	▪ Previous programme evaluation report ▪ Existing feedback collected from events and activities, minutes from post-activity briefings ▪ Programme management & component heads
	2.2 M&E system perceived as useful in helping to cultivate a learning / evidence-informed decision-making culture	▪ Document review ▪ M&E system design ▪ KIIs	▪ M&E system update documentation, templates ▪ M&E data ▪ Meeting minutes ▪ Programme management, component heads, implementers & partners

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
			▪ M&E consultant
	2.3 Evidence of responsiveness – examples of adjustments made in response to relevant contextual changes, emerging risks and/or observations during implementation	▪ Document review ▪ KIIs	▪ Programme documentation ▪ Annual reports ▪ Programme governance / management meeting minutes ▪ Programme management, component heads, implementers & partners
	2.4 Evidence of learning and adaption of the programme to changes in the global scientific trends, funding horizons, and societal/environmental needs (long-term)	▪ Document review ▪ KIIs	▪ Previous evaluations ▪ Annual reports ▪ Programme management, component leads, implementers & partners
3. Is there a risk that Sida funds are used for too many activities? Or is it an opportunity?	3.1 Justification for each of the five programme components, activities under each, and their balance in the budget, in light of Sida's strategy	▪ Document review ▪ KIIs ▪ Portfolio analysis	▪ Sida's 2015–2021 strategy ▪ Recent EBA analyses on Sida support to research capacity ▪ Programme documentation ▪ Sida representatives ▪ Programme management, component leads, implementers & partners
	3.2 Signals that research grants allocated and opportunities provided are (in)sufficient to make a useful difference	▪ Document review ▪ KIIs ▪ Focused survey ▪ Group discussions	▪ Programme, project & course evaluations ▪ Grantee reports ▪ Grantees & other participants ▪ Existing impact review & impact stories
	3.3 Comparison of (perceived) benefits & disadvantages of concentration vs scattering of funding	▪ Literature review ▪ KIIs ▪ Focused survey	▪ Relevant review papers, case studies ▪ Rapid literature scan

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
		▪ Group discussions	▪ Evaluations of similar science grant/research capacity strengthening organisations (esp. focused on LICs & LMICs) ▪ Experts outside programme ecosystem
	3.4 Signals / examples of synergy among programme components that make them 'more than the sum of the parts'	▪ Document review ▪ KIIs ▪ Focused survey	▪ Programme documentation ▪ Annual reports ▪ [Impact review & impact stories] ▪ Programme management, component leads, implementers & partners ▪ Grantees ▪ AAAS, IAP & other partners
4. What have been the most important influences on the (i) relevance and (ii) responsiveness of the programme to changes in context?	4.1 Perceptions and/or descriptions of factors that have influenced the (i) relevance and (ii) responsiveness of the programme and each of its components	▪ Document review ▪ KIIs ▪ Focused survey	▪ Programme documentation ▪ Annual reports ▪ Grantee reports ▪ Existing impact review & impact stories ▪ Sida representatives ▪ Programme management, component leads, implementers & partners ▪ Grantees & other participants ▪ AAAS, IAP & other partners ▪ Experts in field outside programme ecosystem
COHERENCE: How well does the intervention fit?			

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
5. How compatible has the intervention been with other interventions in the sector or organisation where it is being implemented?	5.1 Evidence of outreach, or responses to outreach, to support or align with complementary initiatives in similar thematic or geographic (place-based) areas	▪ Document review ▪ KIIs ▪ Focused survey ▪ Group discussions	▪ Programme documentation ▪ Steering Committee minutes ▪ Programme management, component heads, implementers & partners ▪ Grantees ▪ AAAS, IAP & other partners ▪ Reps of other science grant/research capacity strengthening & other relevant organisations
	5.2 Evidence (examples) of cooperation and/or linkages established with relevant interventions	▪ Document review ▪ KIIs ▪ Focused survey ▪ Group discussions	▪ Annual reports ▪ Steering Committee minutes ▪ Programme management, component leads, implementers & partners ▪ AAS, IAP & other partners ▪ Reps of other science grant/research capacity strengthening & other relevant organisations
	5.3 Evidence of Sida's support to coordination and harmonisation with other Sida programmes as well as programmes by other organisations	▪ Document review ▪ KIIs	▪ Programme management ▪ Sida/TWAS agreement, minutes of meetings
	5.4 Evidence of clear attribution of responsibility for identifying opportunities for harmonisation and coordination and capitalising on them	▪ Document review ▪ KIIs	▪ Steering Committee minutes ▪ Programme documentation and agreements / annexes ▪ Programme management

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
	5.5 Evidence of mapping potential international partners for activities and reasons for not pursuing them	▪ Document review ▪ KIIs	▪ Programme documentation ▪ Programme management, component leads, implementers & partners
6. What have been the most important influences on the coherence, or lack thereof, of the programme (i) within the TWAS ecosystem, and (ii) with other organisations and initiatives?	6.1 Perceptions and/or descriptions of factors that have influenced the coherence (i) within the programme ecosystem and (ii) with other organisations and initiatives	▪ Document review ▪ KIIs ▪ Focused survey	▪ Programme documentation ▪ Existing impact review & impact stories ▪ Sida representatives ▪ Programme management ▪ AAAS, IAP & other partners ▪ Experts in field outside programme ecosystem
EFFECTIVENESS: Is the intervention achieving its objectives?			
7. To what extent has the intervention achieved, or is expected to achieve, its objectives, and its results, including any differential results across groups?	7.1 Per component, congruence between progress and/or achievements, stated objectives and expected outcomes (viewed from a systems perspective and compared across fields, groups, gender, and countries)	▪ Document review ▪ KIIs ▪ Data & trends review	▪ Programme documentation ▪ Theories of change / logframes ▪ M&E system & evaluation reports ▪ Programme internal statistics (raw data) (attendance statistics, feedback, procurement lists, online statistics, etc.) ▪ Annual reports ▪ List of publications from funded projects (completed) ▪ Programme management & implementers, partners ▪ Grantees & course participants, stratified by gender, geography, type of support, type of (envisaged) outcome ▪ Grant application and allocation statistics, review scores

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
	7.2 Credibility and coherence of theories of change and assumptions underlying (i) the programme ToC and (ii) each component ToC (viewed from a systems perspective)	▪ Document review ▪ KIIs	▪ Programme documentation / strategy ▪ Theories of change (ToCs) (logframe where unavailable)
	7.3 Satisfaction of users with online platforms, communication tools, and other online activities	▪ Program data ▪ Survey on online platforms	▪ Users and participants
8. Has the M&E system delivered robust and useful information that could be used to assess progress towards outcomes and contribute to learning?	8.1 Evidence of effective processes in place aimed at ensuring the (i) quality, (ii) usefulness and (iii) actual use of M&E data, analyses and reporting.	▪ Document review ▪ KIIs	▪ Programme documentation ▪ Theories of change ▪ M&E data, impact review & impact stories ▪ Annual reports ▪ Programme management, componente heads, implementers & partners
	8.2 Users' perceptions of the (i) credibility and (ii) utility of the M&E system for accountability and learning	▪ Document review ▪ KIIs	▪ Programme governance, mgmt. & implementers, partners ▪ Grantees & course participants
	8.3 Examples of inspired use of the M&E system	▪ Document review ▪ KIIs	▪ M&E data & documentation ▪ Annual reports ▪ Programme management, component heads, implementers & partners
	8.4 Grassroots-level suggestions for further adjustment of the M&E system	▪ Key informant interviews ▪ Focused survey	▪ Grantees ▪ Activity implementers

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
9. What have been the most important influences on the effectiveness of the programme?	9.1 Perceptions and/or descriptions of factors that have influenced the effectiveness of the programme and each of its components	▪ Document review ▪ KIIs ▪ Focused survey	▪ Programme documentation ▪ Annual reports ▪ Grantee reports ▪ Existing impact review & impact stories ▪ Sida representatives ▪ Programme management, component heads, implementers, partners ▪ Grantees & other participants ▪ AAAS, IAP & other partners ▪ Experts in field outside programme ecosystem
EFFICIENCY: How well are resources being used?			
10. To what extent has the intervention delivered, or is likely to deliver, results in an economic and timely way?	10.1 Unit costs for activities for which it can be calculated (cost per workshop / participant / course attendee / credit unit / publication / etc.)	▪ Document review ▪ KIIs	▪ Programme data ▪ Programme documentation ▪ Procurement protocols ▪ Grantees ▪ Programme management, component heads, implementers
	10.2 Grantees' perceptions of (i) improving cost-efficiency of grants, (ii) flexibility with their ability to get the right kind of support most needed for their research	▪ KIIs	▪ Grantees ▪ Updated review protocol
	10.3 Evidence of where costs for items / activities were challenged, or cost vs. quality and benefit discussed	▪ KIIs ▪ Document review	▪ Meeting minutes ▪ Programme management, component heads, implementers

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
	10.4 Extent to which activities have (i) met their budget allocation, and (ii) started, implemented, and finished on time, and reasons for possible delays and under/overspending	▪ KIIs ▪ Document review	▪ Programme documentation ▪ Annual reports ▪ Programme management, component heads
11. What have been the most important influences on the efficiency with which the programme has been implemented?	11.1 Perceptions and/or descriptions of factors that have influenced the efficiency of programme implementation and each of its components	▪ Document review ▪ KIIs ▪ Focused survey	▪ Programme documentation ▪ Annual reports ▪ Grantee reports ▪ Programme management, component heads, implementers, partners ▪ Grantees & other participants
IMPACT: What difference does the intervention make?			
12. To what extent has the project or programme generated, or is expected to generate, significant positive or negative, intended or unintended, high-level effects that have a good chance to sustain?	12.1 Evidence of (effective) (i) positioning of the programme and (ii) processes put in place to increase the chance of positive outcomes and impacts from each component, with a good chance to sustain	▪ Document review ▪ KIIs ▪ Literature review ▪ Theory of change analysis	▪ Implicit or explicit theories of change ▪ Synthesis literature or evaluation examples of success factors for pathways to impact in similar contexts ▪ Communications & engagement strategies at component & output level ▪ Selection criteria & proposal approval processes ▪ Partner selection strategies ▪ Programme & course evaluation reports ▪ [Impact review & impact stories] ▪ Regional partners ▪ AAS, IAP & other donor / collaboration partners

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
			▪ Programme and component positioning strategies
	12.2 Co-authored articles or article manuscripts between grantees or participants in activities	▪ Focused survey	▪ Grantees ▪ Activity participants
	12.3 Evidence of (i) sustained benefits and (ii) continued collaboration from participation in regional convenings	▪ Focused survey	▪ Activity participants
	12.4 Evidence of application of skill & knowledge gained through participation in science diplomacy courses	▪ Focused survey	▪ Activity participants
	12.5 Evidence of expanding reach of all TWAS communications supported by Sida funding	▪ Platform statistics	▪ Data from all platforms mentioned in program document (TWAS research links network / TWAS Plus, Facebook, Twitter, YouTube, etc.) ▪ Social network analysis of spread of information
	12.6 Evidence of potential, emerging or actual negative consequences of programme or component (i) support, (ii) processes and/or (iii) communications	▪ Document review ▪ KIIs ▪ Focused survey	▪ Evaluation reports ▪ M&E data, incl. grantee reports ▪ Grantees & course participants ▪ Programme management, component heads, implementers, partners
	12.7 Evidence of collaborative activities emerging from TWAS research links network / TWAS Plus by those who have posted collaboration requests.	▪ Focused survey	▪ Network members / Grantees

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
	12.8 Perceptions of negative consequences of any programme process or activity	▪ Annual reports ▪ Grantee reports ▪ KIIs ▪ Focused survey	▪ M&E data, incl. grantee reports ▪ Grantees & course participants ▪ Programme management, component heads, implementers, partners
13. Has the programme had any positive or negative effects on gender equality? Could gender mainstreaming have been improved in planning, implementation or follow up?	13.1 Extent to which gender dimensions have been incorporated in (i) programme & (ii) component strategies (processes and content)	▪ Document review ▪ KIIs ▪ Data & trends review ▪ Focused survey ▪ Group discussions	▪ Annual reports ▪ Proposal review meeting minutes ▪ Programme internal statistics* ▪ M&E data ▪ Grant calls, selection criteria, proposal / reporting processes and requirements; grant approvals and rejections ▪ Project proposals, final reports ▪ Component leads, implementers, partners ▪ Grantees & course participants ▪ GIS & OWSD representatives
	13.2 Extent to which relevant contexts have been taken into account in efforts to encourage incorporation of gender dimensions in (i) programme and (ii) component strategies	▪ Document review ▪ KIIs ▪ Survey? ▪ Group discussions	▪ Programme documentation ▪ Component heads, implementers, partners ▪ Grantee reports ▪ Grantees & course participants
	13.3 Evidence of gender equality, as well as gender-transformative approaches, being promoted to applicants and relevant stakeholders	▪ Document review ▪ KIIs	▪ Grant calls, public communications and information ▪ Press releases and appearances in media ▪ Programme management

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
	13.4 Examples of gender-related interventions that have been implemented, and tangible outcomes from those interventions	▪ Document review ▪ KIIs	▪ Programme management ▪ Programme documentation
14. Has the programme had any positive or negative effects on the environment? Could environment considerations have been improved in planning, implementation or follow up?	14.1 Extent to which the environment has been incorporated in (i) (TWAS strategies and plans; (ii) programme strategies (iii) component strategies (iv) programme calls and instructions and (v) project proposals and final reports	▪ Data & trends review ▪ KIIs ▪ Focused survey ▪ Group discussions	▪ TWAS strategic documents ▪ Annual reports ▪ Proposal review meeting minutes ▪ Programme internal statistics* ▪ M&E data ▪ Selection criteria, proposal & reporting processes & requirements; approvals & rejections ▪ Grantee reports ▪ Component heads, implementers, partners ▪ Grantees & course participants
15. What have been the most important influences on programme efforts to effect and inspire change – including w.r.t. gender responsiveness, the inclusion of environmental considerations, and the sustainability of desired changes?	15.1 Perceptions and/or descriptions of factors that have influenced the efforts to effect positive changes that have a good chance to sustain, including w.r.t. (i) gender responsiveness and (ii) environmental considerations	▪ Document review ▪ KIIs ▪ Focused survey	▪ Programme documentation ▪ Annual reports ▪ Grantee reports ▪ Programme management, component heads, implementers, partners ▪ Grantees & course participants

Evaluation Questions	Tracing of Emerging Patterns / Indicators	Data Collection Instruments	Sources of Information
THE FUTURE			
16. How well has the programme performed over the past five years? What are the implications for the future?	n/a	▪ n/a	▪ Synthesis of all relevant findings and their implications
17. How can what has been learnt about change be applied to enhance the chance of significant outcomes and impact through TWAS programming in STLCs in this new era? What are attractive options?	n/a	▪ n/a	▪ Synthesis of all relevant findings and their implications

Notes:

Programme documentation includes but is not limited to:

- Meeting minutes
- Workshop reports, conference reports, reports from other activities
- Regional partner meeting minutes, reports
- Science diplomacy collected feedback from activities, minutes
- Project proposals, reviews, interim reports, final reports
- List of equipment procured
- List of journal articles with bibliographic details
- Conference documentation: Call, list of abstracts/talks, etc.
- List of conference participants
- Newsletters
- Digital Plus bulletins

Programme internal statistics* include but are not limited to:

- expenditure
- access to the internal database
- publishing activity
- application statistics + anonymous data on 2021 applications
- grant statistics
- extension addendums
- MSc statistics
- student satisfaction statistics from end-of-course/workshop surveys, feedback from conferences, networking events, alumni events, etc.
- grant recipient tracking data (tracer)
- online platform statistics
- conference participation statistics
- science diplomacy statistics (partners, workshops, people involved, etc.)

Annex 6: Methods

Document reviews. Document reviews provided the initial key source of data and information to the evaluation. The documents were purposefully sampled from programme documentation, guided by the evaluation questions and indicators articulated in the Evaluation Matrix. Reviews of programme documentation provided detailed information about progress and completion of activities, meeting agenda and meeting minutes, templates, grant application procedures, application data, grant decisions, and successes and challenges of the programme implementation. Documentation from years prior to 2017 was included to a limited extent to get a better understanding of the context and dynamics that have led to TWAS's present approach.

Stakeholder mapping. A list of stakeholder groupings (Annex 7) was developed to inform the sampling strategy for interviews and surveys (details in Chapter 1).

Retrospective theory of change development. Using available documents, the Evaluation Team retrospectively developed theories of change (see Annex 16) for the programme overall and for each component in order to support analyses of pathways and progress towards impact. They were intended only for the purposes of the Evaluation Team; they were not co-created with TWAS staff as good ToC development practice for organisational purposes would require.

Key informant and group interviews. The key informant interviews were semi-structured, and they followed a master interview guide that was tailored to each different informant group. Interviews were conducted online, most individually, but some in small coequal groups of 2-3 people, with a few larger groups. Most interviews took 45-60 minutes. Interviews were recorded and partially transcribed, and where interviewees did not consent to recording, only interview notes were taken. Interviews were analysed on a RAG (red-amber-green) evidence matrix to keep track of accumulating evidence towards each evaluation criterion. Interviewees were purposefully sampled, and the sampling aimed at including representatives from the different types of stakeholders in each of the programme components. The target number in the inception report, 35 interviews, was exceeded; the total number of interviewees was 58 persons.

On-line self-reported survey on Component 1: Research Grants. An electronic web survey of recipients of both individual and research unit grants from TWAS between 2017 and 2020 was conducted during the period 19 May 2021 to 30 May 2021. On the 17-18 of May 2021, the survey was completed by a test group of seven grant recipients, after which the formulation of questions was perfected based on the testers' feedback, and the survey was sent out to the larger group of 217 grant recipients. The qualitative responses of the test group were included in the analysis, but they are not included in

the described sample because the questions changed after their feedback. The response rate was 80% based on 170 responses (169 full and one partial) out of 213 emails sent, excluding the test group of seven people. The survey questionnaire is included as Annex 11, and the survey data is included as Annex 13. Not all questions in the survey were mandatory, so the response rate on certain question differ.

On-line self-reported survey on Component 2: Regional Partners. An electronic web survey of participants of events organised by TWAS Regional Partners between 2017 and 2019 was conducted during the period 22 May 2021 to 5 June 2021. The survey was sent out to participants of events organised the TWAS Regional Partners in 2017-2019. Due to the hosting institution's policy, Biblioteca Alexandrina has not been able to provide the participant's e-mail addresses, so most participants of events hosted by Biblioteca Alexandrina were not included in the sample. The response rate was 15% based on 67 responses (58 full and nine partial) out of 443 emails sent. The response rate being much lower than the response rate for the Research Grants survey can be explained by a comparatively lower significance of participating in an event compared to receiving a grant, and consequently less motivation to participate in a survey. The survey questionnaire is included as Annex 12, and the survey data is included as Annex 14. Not all respondents completed the entire survey, so the response rate on certain question can differ.

Communications analytics. Communication analytics data can be found in Annex 15.

Survey responses

The data from the communication section of the survey were collected, in particular the questions 1) “To what extent do you agree or disagree with the following statement? have easily found from TWAS website the information that I need”. 2) “Rate the following communication channels in the order of importance for you getting information from TWAS (1 - most important, 6 - the least), the options included: the website, Twitter, Facebook, TWAS Plus, Email and Research links network”. The analysis for such questions included the mode (the most frequent choice) and the mean (the average rating by all users). The data were obtained from the grant applicants (n=170) and partners (n=58).

Website analysis

To analyse the website, the site was visited several times, tested in low and normal bandwidth modes. Google analytics dashboard were carefully studied for all the recorded period, regarding sessions, users, page views, time on site and bounce rates. Raw data from Google analytics were obtained, downloaded in from 2014-06-01 to May 2021.

The analysis included geographical distribution of users, landing pages, as well as users, sessions, and page views. To examine the growth, we used 1) yearly growth rate percentage (the percentage of change from the preceding year) calculated using the formula: ((value of the current year – value of the past year)/ value of the past year) *

100. 2) average growth rate represents the average of all growth rates for all the previous years. The trend of the website was plotted using monthly data (84 months), the plots included the trend of users, sessions, and active users.

Newsletter

The newsletter data were downloaded from Mailchimp, campaigns with less than 10 users were excluded since they represented test campaigns. The analysis included the growth rates and average growth rates of total recipients, total recipients, and unique clicks by users.

Twitter

Twitter data were downloaded for the past four years- the maximum allowed by Twitter- a total of 3200 tweets were then downloaded. To uncover the general content of the twitter stream we used structural topic modelling, which is a technique that uncovers the topics and the prevalence of themes, the number of topics were decided based on a combination of best model as well as best interpretable model.

Social network analysis. SNA was performed to understand the structure of the content and how topics were linked to each other. Therefore, hashtags were collected, cleaned and a network of co-occurrence was built. Community (hashtags that frequently occur together) were discovered using modularity decomposition and each community was coloured differently.

Triangulation. Triangulation was done between sources and between methods. Among others, the RAG (red-amber-green) evidence assessment rubric was used to help keep track of accumulating evidence per each evaluation question. A RAG rubric helped the team steer the triangulation and data collection process towards questions where evidence had not crystallised into clear findings. The rubric also helped the team to maintain a line-of-sight between findings and evidence.

Annex 7: Stakeholder Map

Grouping	Stakeholder	# persons / members	Notes
Funders	Sida	3	
Programme governance	Steering Committee	5	3 from Italy: 1 from Ministry of Foreign Affairs, 1 Scientist from the Developing World, 1 Scientist from Italy, both appointed by Italy 2 from UNESCO: Assistant Director-General Science and 1 Scientist from Developing Countries appointed by UNESCO Observers: OWSD President, InterAcademy Partnership (IAP) Co-Chair, representatives of major donors
	Council	15	President, Immediate Past President, Secretary General, Treasurer, 5 Regional Vice Presidents, 5 Regional Council Members, ICTP Director Ex-Officio
Programme management	Executive Director	1	
	Heads of Sida supported components	3	*Max Paoli*: Research Grants, Regional Partners *Peter McGrath*: Science Diplomacy and Refugee and Displaced Scientists *Raffaella De Lia*: Communications
	UNESCO Science Sector and Central Services	Several in Trieste & Paris	In the implementation, TWAS works with the Science Sector and Central Services such as: Bureau of Strategic Planning, Bureau of Financial Management, Bureau of Human Resources Management, Internal Oversight Service, Office of International Standards and Legal Affairs
	Coordinating Committee	11	Monthly meetings involving TWAS, IAP and OWSD to discuss and coordinate matters of common interest and status of implementation of various projects including the one under evaluation
Implementers	Monitoring & Evaluation	1 + 5	Consultants and staff responsible for ongoing data collection
	Heads of Sida supported components	3 + support staff	*Max Paoli:* Research Grants, Regional Partners *Peter McGrath*: Science Diplomacy and Refugee and Displaced Scientists *Raffaella De Lia*: Communications
	Organisers of activities, workshops & conferences	5	Staff involved in programme implementation. Done with the support of staff in Finance, Administration and Executive Director's office
	Regional coordinators & staff	5 coord.	In-kind support provided by Regional Partners; plus other support staff

Partners	**OWSD**	**8**	**Not part of the evaluation**
	IAP and ISC	-	Collaborate with TWAS on Refugee and Displaced Scientists project
	Regional coordinators & staff	5 coord.	In-kind support provided by Regional Partners; plus other support staff
	Science diplomacy programme partners (AAAS, IAP)	2+1	2 AAAS coordinators + *P. McGrath* Monetary support by AAAS
	Outreach & communication partners	-	OWSD, GIS and IAP
Intended beneficiaries / programme participants	Individual grant recipients	*Annex 3	
	Research group / unit leaders	*Annex 3	
	Participants of activities, workshops, and conferences	*Annex 3	

Breakdown by Programme Components		
Component	**Stakeholder**	**# persons / members**
Research Grants	Individual grant recipients	*Annex 3
	Research group / unit leaders	*Annex 3
	MSc supported	*Annex 3
	Participants of Conferences for TWAS Research Grantees	*Annex 3
	Reviewers	20-25
Regional Partners	Pretoria, South Africa - TWAS Sub-Saharan Africa Regional Partner (TWAS-SAREP)	1 Coordinator & support staff
	Bangalore, India - TWAS Central and South Asia Regional Partner (TWAS-CASAREP)	1 Coordinator & support staff
	Alexandria, Egypt - TWAS Arab Regional Partner (TWAS-AREP)	1 Coordinator & support staff
	Beijing, China - TWAS East and South-East Asia and the Pacific Regional Partner (TWAS-SAPREP)	1 Coordinator & support staff
	Rio de Janeiro, Brazil - TWAS Latin America and the Caribbean Regional Partner (TWAS-LACREP)	1 Coordinator & support staff
	Participants in Regional Conference for Young Scientists (2017-2020)	*Annex 3
Science Diplomacy	Science diplomacy ambassadors	*Annex 3
	Participants of summer courses of science diplomacy	*Annex 3
	Participants of regional workshops on science diplomacy	*Annex 3

	Science diplomacy programme partners (AAAS, Using Science for/in Diplomacy for Addressing Global Challenges project (S4D4C))	1 coordinator (*P.McGrath* - AAAS, not supported by Sida)
Communications	TWAS Public Information Office	5 staff
	Recipients of Newsletter / Recipients of TWAS-Plus	*Annex 3
	Outreach & communication partners – regional partners	5 coordinators and some other supporting staff
Refugee and Displaced Scientists	Implementers - Erin Buisse Consulting	-
	Partners – IAP and ISC	-

Annex 8: Documents Reviewed

Relevant Reports

- Fellesson, M., 2017. Research Capacity in the New Global Development Agenda Mobility, Collaboration and Scientific Production among PhD Graduates Supported by Swedish Development Aid in Africa. Expert Group for Aid Studies.
- Nilsson, D., Sörlin, S., 2017. Research Aid Revisited – a historically grounded analysis of future prospects and policy options. Expert Group for Aid Studies.
- UNESCO, 2015. UNESCO Science Report: towards 2030 – Executive Summary.

Sida strategies

- Ministry of Foreign Affairs, 2014. Research Cooperation Strategy 2015-2021 (in English)

TWAS-Sida Agreement and Application

- TWAS Project Document, October 2016. Building Research Capacity in the Basic Sciences in Developing Countries 2017-2021
- Letter of Contribution in Favour of TWAS, May 2017
- Amendment 1 to the Letter of Contribution in Favour of TWAS, December 2017
- Amendment 2 to the Letter of Contribution in favour of TWAS, November 2019

TWAS Documentation

- TWAS Steering Committee Meeting Minutes, 2018-2021
- TWAS Annual Review Meeting with Sida Minutes, 2018-2021
- TWAS Sixth Strategic Plan, 2021-2025
- TWAS Organisational Chart, 2021

TWAS Annual Narrative and Financial reports

- TWAS Reports on Sida-Funded Activities, 2018-2021
- TWAS Annual Financial Reports for 2017-2020

Former Evaluations

- Sida Decentralized Evaluation, 2016. Kruse, S.E., Powell, A.G., Evaluation of Sida Support to TWAS, OWSD and GIS.

TWAS Internal M&E Documentation and Reports

- Draft M&E Framework for Research Grants
- Impact of TWAS Research Grants Programme, Brown, A.M., 2019.
- TWAS Desk Review Report, Brown, A.M., 2019.
- TWAS Regional Research Grants Conference "Building Skills for Scientific Research" 4-6 June 2019 Kathmandu, Nepal Evaluation Report with Annexes. Brown, A.M., June 2019.
- TWAS Research Grants and Science Diplomacy, Stories of Impact, Brown, A.M.

TWAS M&E Templates:
- Evaluation Form for TWAS events
- Feedback Form on TWAS Prizes and Awards
- Feedback on conference participation
- Questionnaire Impact Case
- Questionnaire MSc Students
- Questionnaire Research Grants Programme (Follow Up Form)
- Story collection template for Most Significant Change method

Websites
- TWAS Facebook. www.facebook.com/TWAS.Science/ (accessed April 2020)
- TWAS Twitter. https://twitter.com/TWASnews (accessed April 2020)
- TWAS Website. https://twas.org/ (accessed April 2020)

Documentation by Components

Component 1: Research Grants

General documentation:
- UNESCO-IOS audit of TWAS, 2017
- Research Grant Awards- list of grantees awarded in 2017-2020
- TWAS Research Grants Application forms for Individual Scientsts and for Research Units
- TWAS Research Grants Programme in Basic Sciences for Research Units in STLCs, Guide for applicants, 2021
- TWAS Research Grants Programme in Basic Sciences for Individual Scientsts in STLCs, Guide for applicants, 2021
- Evaluation Criteria for the assessment of TWAS Research Grants
- Applications data (2017-20)
- Application scoring (2017-20)
- Research Grants Outputs (2017-20)
- Research Grants Award Letter
- Research Grant Agreement with Annex to contracts under the Research Grants programme
- Publications from grantees (2017-18-19-20)
- TWAS Steering Committee Meeting agendas, 2018-2021

A selection of Application data from several grantees, including:
- Application forms
- Final reports
- Reviewer reports
- Submitted photos

Minutes of Research Grants Selection meetings:
- Biology Minutes 2017-2020
- Chemistry Minutes 2017-2020
- Mathematics Minutes 2017-2020
- Physics Minutes 2017-2020

General statistics, 2017-2020:
- Application and Award overview
- Application to award ratio and breakdown
- Applications received
- Awards by Gender 2016 - 2020
- Research Grant Award Distribution

Component 2: Regional Partners

General documentation:
- All Regional Partner event participants, 2017-2019
- List of all Regional Partners events 2017-2020
- Information on surveys and questionnaires from Regional Partners to their Conference Participants

Regional Partner in China SAPREP
- Post-Workshop Evaluation Summary: Workshop on Ecosystem-based Adaptation through South-South Cooperation

Documentation on events organised by the Regional Partner in Egypt AREP in 2017-2020:
- TWAS-AREP 2020 Closed Meeting Program
- TWAS AREP Science Diplomacy 2019 Post Workshop Evaluation Survey
- Conference material from AREP Egypt 2017-2020
- TWAS AREP Collective Report 2017- 2020
- TWAS-AREP 2018 Technical Reports, 2018-2020
- TWAS-Arab Regional Office 2017 Technical Report

Documentation on events organised by the Regional Partner in South Africa SAREP in 2017-2020:
- Conference Proposals, Activities Plans, Concept Notes, Invitations, Programmes, Booklets, Brochures and Reports
- Lists of participants
- Statistics on events organised
- Annual Activities Reports for 2017-2020
- Photographs taken

Component 3: Science Diplomacy

General documentation:
- Contact details of organisers of Science Diplomacy events
- Lists of Participants and Speakers , 2017-2020
- Guidelines on online Science Diplomacy events
- Guidelines to organise Science Diplomacy events for local partners

Documentation on Science Diplomacy events:

- **2018 Regional workshop Sub-Saharan Africa:** Invitation and ToR, Expression of Interest to host, Call for Candidates, Agenda, Reports, post-course evaluations
- **2019 Regional workshop Arab region:** Invitation and ToR, Workplan, Call for Candidates, Agenda, post-course evaluations
- **2019 AAAS-TWAS Train the Trainers course** Call for Candidates, Agenda, Reports, post-course evaluations
- **2020 Alumni review meeting:** Agenda, Outcomes based agenda, Report
- **2021 Regional workshop South-East Asia:** Invitation and ToR, Workplan, Call for Candidates, Agenda, Reports, post-course evaluation
- **AAAS-TWAS summer courses in 2017, 2018, 2020:** Agendas, reports, post-course evaluations, 2018 and 2020 summer course: advance reading materials

Monitoring and Evaluation of Impact:

- Science Diplomacy Alumni Survey 2020
- Theory of Change model of TWAS Science Diplomacy programme

Documents received from contacted event participants:

- Ansari A, 2021. “Science Diplomacy: A Platform to Think Beyond the Boundaries". Acta Scientific Pharmaceutical Sciences 5.6: 81.
- López-Vergès S, Macías-Navarro L, Hernández-Mondragón AC, Corrales-Aguilar E, Soler MG and Guerra M , 2021 Closing the Gap Between Emerging Initiatives and Integrated Strategies to Strengthen Science Diplomacy in Latin America.

Component 4: Outreach and Communication: Details on materials reviewed can be found in Annex 13.

Component 5: Refugee and Displaced Scientists

- Refugee and Displaced Scientists, Desk Review, 2020
- Stakeholder Analysis: Refugee and Displaced Scientists Network – Working Document, 2021
- “Science in Exile” webinar series concept note
- List of stakeholders and participants in working groups, workshops, calls, task teams.
- Strategic framework – Drafts

Annex 9: Persons Interviewed

Name	Surname	Gender	Position	Organisation	Stakeholder Grouping
Andreas	Admasie	Male	In-charge of the Scientist at risk component of Sida´s support to TWAS	Sida	Funder
Fadwa	Alhalaiqa	Female	Associate Professor of psychiatric/mental health nursing	Philadelphia University, Jordan	Participants of 2019 Regional Workshop on Science Diplomacy by TWAS and Bibliotheca Alexandrina, Egypt
Amira	Alkharusi	Female	Assistant Professor	Sultan Qaboos University, College of Medicine, Department of Physiology, Oman	Participants of 2019 Regional Workshop on Science Diplomacy by TWAS and Bibliotheca Alexandrina, Egypt
Tabitha	Amollo	Female	Lecturer, Physics department	Egerton University, Kenya	2020 Grant recipients, Individual
Mary	Antwi	Female	Lecturer, Department of Environmental Management	University of Energy and Natural Resources, Ghana	Participants of 2018 Regional Workshop on Science Diplomacy by TWAS and ASSAf, South Africa
Susana	Arrechea	Female	Principal Investigator, Researcher	University San Carlos of Guatemala	2017 Grant recipients, Individual

Wondimu	Ashagre	Male	Medical Laboratory Technologist	Armauer Hansen Research Institute, Ethiopia	Participants of events organised by TWAS Regional Partners
James John	Banda	Male	Research Officer	Monkey Bay Fisheries Research Station, Malawi	Participants of 2018 Regional Workshop on Science Diplomacy by TWAS and ASSAf, South Africa
Ann	Brown	Female	M&E Consultant	M&E Consultant	M&E/ Implementors
Fred	Carden	Male	Previously head of evaluation at IDRC	IDRC	Experts in Research in LDCs
Sara	Dalafi	Female	Implementing Staff, Science Diplomacy component	TWAS	Implementors
Raffaella	De Lia	Female	Public Information Office, Head of Outreach and Communications component	TWAS	Implementors/ Programme management
Guy Aymard	Degla	Male	Maths Researcher	Institut de Mathematiques et de Sciences Physiques, Benin	2017 Grant recipients, Group
Ashim	Dhakal	Male	Chief Scientist, Physics	Phutung Research Institute, Nepal	2018 Grant recipients, Individual
Roseanne	Diab	Female	TWAS Council Member	TWAS	TWAS Council - Programme governance
Uyanga	Enkhnaran	Female	Researcher, Institute of Physics and Technology	Mongolian Academy of Sciences, Mogolia	2020 Grant recipients, Individual
Manal	Fardon	Female	Instructor of General Biology and Plant Physiology labs	American University of Beirut, Lebanon	Participants of 2019 Regional Workshop on Science Diplomacy by TWAS and Bibliotheca Alexandrina, Egypt
Paolo	Fornasiero	Male	Reviewer Chemistry	TWAS	Apllication Reviewers

Emmanuel	Fouotsa	Male	Associate Professor of Mathematics	The University of Bamenda, Cameroon	2020 Grant recipients, Individual
Sena	Galazzi	Female	Implementing Staff, Science in Exile component	TWAS	Implementors
Vijaya	Gopal	Female	Reviewer Biology	TWAS	Apllication Reviewers
Marga	Gualsoler	Female	AAAS Consultant/Independent Consultant on Science Diplomacy	AAAS Consultant/Independent Consultant on Science Diplomacy	Partners of TWAS
Hala	Handal	Female	Researcher	National Research Centre, Egypt	Participants of 2019 Regional Workshop on Science Diplomacy by TWAS and Bibliotheca Alexandrina, Egypt
Mohamed H.A.	Hassan	Male	The Italian Government representative on the TWAS Steering Committee, TWAS President and observer of science and support	TWAS	Programme Steering Committee - Programme governance
Barbara Burmen	Kabai	Female	Implementation Science Coordinator	Kenya Medical Research Institute Center for Global Health Research, Kenya	Participants of events organised by TWAS Regional Partners
Egide	Kalisa	Male	Researcher, Chemistry	University of Rwanda	2020 Grant recipients, Individual
Vignarooban	Kandasamy	Male	Senior Lecturer in Physics, Faculty of Science	University of Jaffna, Sri Lanka	2017 Grant recipients, Individual
Tonjock Rosemary	Kinge	Female	Associate Professor of Mycology, Department of Biological Sciences	The University Of Bamenda, Cameroon	Participants of events organised by TWAS Regional Partners
Neil Stephen	Lopez	Male	Associate Professor	De La Salle University, Philippines	Participants of 2021 Online Regional Workshop on Science Diplomacy by

					TWAS and The Academy of Sciences Malaysia
Claire	Lyngå	Female	Previous research advisor for TWAS/OWSD at Sida	Sida	Funder
Stanley	Maphosa	Male	TWAS Sub-Saharan Africa Coordinator	TWAS Sub-Saharan Africa Regional Partner	Regional Partners Coordinators
Peter	McGrath	Male	Head of the Science Diplomacy component, Head of the Science in Exile component, IAP, GIS	TWAS	Implementors / Programme management, Partners of TWAS
Emilia	Mezzetti	Female	Reviewer Mathematics	TWAS	Apllication Reviewers
Luc	Mougeot	Male	IDRC Representative	IDRC	Partners of TWAS
Pius Tshimankinda	Mpiana	Male	Vice head of Chemistry department in charge of research	Université de Kinshasa, DRC	2018 Grant recipients, Group
Caroline	Muneri	Female	Faculty of Veterinary Medicine and Surgery, Department of Veterinary Surgery, Medicine and Theriogenology	Pwani Univeristy, Kenya	Participants of 2018 Regional Workshop on Science Diplomacy by TWAS and ASSAf, South Africa
Romain	Murenzi	Male	Executive Director	TWAS	Executive Director - Programme management
Lizzy Aluoch	Mwamburi	Female	Professor, Biology	University of Eldoret, Kenya	2017 Grant recipients, Group
Denny	Ng	Male	Associate Head	School of Engineering and Physical Sciences, Heriot-Watt University Malaysia, Malaysia	Participants of 2021 Online Regional Workshop on Science Diplomacy by TWAS and The Academy of Sciences Malaysia
Joe	Niemela	Male	Reviewer Physics	TWAS	Apllication Reviewers
Chantale	Njiomou	Female	Assistant Professor, Département de Chimie Inorganique	University of Yaounde I, Cameroon	2019 Grant recipients, Group

Anna-Karin	Norling	Female	Previous research advisor for TWAS at Sida	Sida	Funder
Eva	Ohlsson	Female	Research advisor for TWAS	Sida	Funder
Hem Raj	Pant	Male	Professor, Applied Sciences and Chemical Engineering	Tribhuvan University, Nepal	2018 Grant recipients, Group
Max	Paoli	Male	Head of the Research Grants component, Head of the Regional Partners component	TWAS	Implementors/ Programme management
Payal	Patel	Female	Implementing Staff, Research Grants component	TWAS	Implementors
Francesca	Pettoello	Female	Public Information Office, Implementing staff for Outreach and Communications component	TWAS	Implementors
Cristina	Serra	Female	Public Information Office, Implementing staff for Outreach and Communications component	TWAS	Implementors
Hari	Sharma	Male	Central Department of Zoology	Tribhuvan University, Nepal	2018 Grant recipients, Individual
Miller	Shatsala	Male	Researcher, Physics	Masinde Muliro University of Science and Technology, Kenya	Participants of events organised by TWAS Regional Partners
Cristina	Simoes	Female	Implementing Staff, Regional Partners component	TWAS	Implementors
Sihem	Soufi	Female	Postdoc	National Agronomical Institute of Tunisia, Tunisia	Participants of 2019 Regional Workshop on Science Diplomacy by TWAS and Bibliotheca Alexandrina, Egypt
Aldo	Stroebel	Male	Executive Director of Strategic Partnerships	National Research Foundation of South Africa	Experts in Research in LDCs

Wasanthi	Subasinghe	Female	Head, Department of Biochemistry and Clinical Chemistry	University of Kelaniya, Sri Lanka	2019 Grant recipients, Individual
Rebecca	Tettey	Female	Senior Regulatory Officer	Food and Drugs Authority, Ghana	Participants of 2021 Online Regional Workshop on Science Diplomacy by TWAS and The Academy of Sciences Malaysia
Sean	Treacy	Male	Public Information Office, Implementing staff for Outreach and Communications component	TWAS	Implementors
Pierangeli	Vital	Female	Laboratory Head, University Researcher and ASEAN S&T Fellow	Natural Sciences Research Institute, University of the Philippines Diliman, Quezon City, Philippines	Participants of 2021 Online Regional Workshop on Science Diplomacy by TWAS and The Academy of Sciences Malaysia
Zhenyu	Wang	Male	TWAS East and South-East Asia and Pacific Coordinator	TWAS East and South-East Asia and Pacific Regional Partner	Regional Partners Coordinators

Annex 10: Interview Instruments

As the main tool, a generic interview guide was designed, from which specific questions were drawn and tailored per interview. Below is the generic interview guide, with a few examples of tailored interview guides.

GENERIC LIST OF QUESTIONS FOR TWAS INTERVIEWS

RELEVANCE & SIGNIFICANCE

10. How satisfied are you that the five programme components are essential to help develop the type of scientists/researchers that LDC / STLCs need at this time? Reasons?
11. Are all five sufficiently significant or valuable to absorb limited resources, especially given opportunities provided by other research funding sources? Reasons?
12. Are there sufficient capacities and resources in TWAS to do justice to each of these components? Reasons?
13. What has influenced the design of this component / event / course? Why this specific approach? Was it necessary to make any trade-offs in its design or implementation?
14. Would there be any merit in having thematic or other specific foci in the programme? Reasons? If so, what could these be and why?
15. How are the foci or themes for regional events/courses/workshops decided upon? What are the criteria or principles for these decisions, and by whom? How satisfied are you that they address real priorities, and why?
16. Why did you apply or agree to participate in this opportunity? Have your expectations been met?
17. How responsive has the programme / component been to developments and changes in context over these five years - whether within TWAS with its partners, or external to this TWAS ecosystem? Reasons and outstanding / the best examples?
18. Is there a learning / evidence culture in TWAS and among its partners, and has the M&E system played a role in this responsiveness, or lack thereof?
19. In your view, what have been the main reasons for the relevance and responsiveness (or lack thereof) of/in the programme?
20. How would you characterise the scientists that LDCs / STLCs need at this time? What would be their main features and why?
21. In your view, what are the most important global and/or regional influences affecting scientific / research priorities today and likely well into the future – including in LDCs / STLCs?

22. Are there any emerging risks to the relevance and responsiveness of the work supported through this programme? How can this be improved?

QUALITY

23. How is "quality" (i) research and (ii) researchers defined by TWAS? How is this reflected in selection criteria in the different components?
24. To what extent is the specific context of the researcher(s)/participants considered in these processes?
25. How does TWAS safeguard the quality of its events and courses in this programme? How does it ensure that they address the state of the art within context? Are there any trade-offs and compromises that need to be made and if so, what are the implications?
26. How does TWAS view the decolonisation debates and how these might influence its work?
27. How does TWAS view the issues of multi-, inter- and transdisciplinarity in its support in each of the components?
28. What are the main factors influencing TWAS's / partners perspectives on 'quality' in this programme?
29. Are there any emerging risks to the quality and credibility of the work supported through this programme? Any improvements needed?

COHERENCE

30. How much effort has TWAS put into creating a coherent programme that is also well aligned with other TWAS initiatives? Reasons? How is this reflected in the programme?
31. How much effort has TWAS put into creating synergies and/or alignment and/or a harmonised approach (i) with and among its partners; (ii) between its programmes and other relevant initiatives? Reasons?
32. How is this reflected in the make-up of the programme, and in the ways of designing and implementing the programme/component? Is someone responsible for cultivating such synergies? Are discussions held about the best way to enable this?
33. How does TWAS approach partnerships and cooperation in this programme? Are there particularly outstanding examples of efforts to create alignment and synergy with and beyond UNESCO, IAP, AAAS, OWSD, GIS?
34. How important is intra- and inter-regional cooperation in the programme / component context?
35. To what extent does TWAS think about "systems" or "systems change" rather than "projects" when designing its programme?
36. How well is this programme aligned with Sida policies and programmes in general? Does it work in synergy with any other efforts of support within Sida or the MFA (or others)?
37. In your view, what are the most important influences affecting (efforts to create) coherence and synergies in the context of the Sida-TWAS programme?

38. Are there any emerging risks to the coherence of the programme or work supported through this programme? How can coherence be improved?

EFFECTIVENESS

39. What worked well in this programme / component since 2017? What did not? What have been main highlights? Any spectacular failures?
40. Have your expectations been met? Why / Why not?
41. Any major concerns with respect to how the programme has been (i) designed and (ii) implemented?
42. In your view, what are the main reasons for the (i) successes; (ii) less successful efforts in this programme / component?
43. What can you tell us about the available data about trends and performance?
44. How useful has the M&E system been in producing evidence for learning, understanding, taking decisions, planning? What words come to mind when thinking about the M&E system?
45. Any outstanding examples of use? Or on the other hand, opportunities for use of the M&E system and/or evidence that have not been met?
46. How comfortable are you with the credibility of the M&E data on the system, and in studies and reports? Reasons?
47. How have you dealt with the issue of baselines reflected in the logframe?
48. How important is the role of partnerships in programme/component effectiveness? What can be done to improve this, if necessary?
49. Would you consider the programme as gender-responsive? Gender-sensitive? Gender-transformative? Why?
50. Where - and how/how well – has issues of gender been attended to? What has driven the focus on gender?
51. How well, and where, is care for the environment embedded in the programme? Where is it reflected in (i) policies, (ii) processes and (iii) content?
52. In your experience, what have been the most important influences on the effectiveness of programme?
53. What are the main influences on how (i) gender and (ii) the environment are accommodated in the programme?
54. Are there any emerging risks to the effectiveness of the programme or work supported through this programme? How can effectiveness be improved?

EFFICIENCY

55. Can you highlight specific measures taken to increase the efficiency of processes over the past five years? How, when and by whom?
56. How well did these measures work?
57. Where are improvements needed to ensure efficient processes and systems?
58. What are the main influences on efforts to be more efficient – or lack of such attention?

IMPACT

59. Can you describe for me what would have been different if this programme did NOT exist?
60. In your view, what are the most outstanding, most valuable positive differences the programme / component has made since 2017 / in your work? Why are these the most outstanding?
61. What are the chances that positive changes resulting from the programme will sustain? Reasons? What should have been done, or can be done, to improve the chances that they will sustain?
62. Were there any surprises, in other words unexpected effects, compared to what was expected or what you could expect from this type of programme? Why were they a surprise?
63. Are you aware of any ripple effects resulting from the programme support – in other words, further changes that might have happened after the changes that happened as a direct result of the support?
64. Could you detect any negative consequences from anything that was done through this programme, or from the way it was designed? Were any mitigating efforts made? How can these be avoided in future?

EXAMPLE OF INTERVIEW GUIDE FOR GRANTEES

Thank you very much for making the time available to share your experiences with us. We look forward to learning from your insights and experience. We will send you a separate zoom link for the interview.

The interview is fully confidential, and your answers will be completely anonymous. We would, however, like to add your name in the list of people interviewed (we expect the list to contain 50+ people). If you wish your name to be excluded from that list, please let us know.

If we use direct quotations, we use them in a way that does not compromise the anonymity of people interviewed (or ask them for permission).

On your permission we would like to record the interview (sound only, no video) so that we can later get back to our notes and confirm what was said. At the beginning we will ask if recording the session is ok, and will not switch recording on if you wish so.

Below are the broad areas we wish to interview you about, and example questions from each area. We will have the time to discuss only few of them, and we are flexible with not following the template very strictly if the interview raises up some other interesting topics—or if you wish to bring up something you think is important.

RELEVANCE & SIGNIFICANCE

65. How satisfied are you that the grants are essential to help develop the type of scientists/researchers that least developed countries (LDCs) / science and technology lagging countries (STLCs) need at this time? Reasons?
66. How would you characterise the scientists that LDCs / STLCs need at this time? What would be their main features and why?
67. In your view, what are the most important global and/or regional influences affecting scientific / research priorities today and likely well into the future – including in LDCs / STLCs?

QUALITY

68. In your experience, how does TWAS look at what is “high quality” (i) research and (ii) researchers?
69. To what extent do you feel your particular circumstances / context was taken into account in the grant processes?
70. What do you think about the quality of TWAS’s procurement processes, events, and activities? Did everything work as you expected? Anything that exceeded your expectations? Any hiccups or problems?

COHERENCE

71. How did TWAS connect you with (i) other TWAS-funded projects; (ii) other projects in your field; (iii) other organisations that can support your research? What came out of that? Are you still working with those contacts?
72. How much cooperation did you have in your region, organised by TWAS? How much outside your region?

EFFECTIVENESS

73. How well did the TWAS grants programme meet your expectations? Why / Why not?
74. Can you tell us about your experience with reporting back to TWAS? Was it more or less tedious than reporting to other similar funders or donors?
75. What are the biggest risks with TWAS type of support in your university or country?

EFFICIENCY

76. If you think about the items TWAS purchased for you, are you satisfied with the quality you got for their cost?
77. How was the procurement process? (fast / slow, bureaucratic / smooth, clear/unclear)
78. How easily accessible were the other types of funds available through your grants?

IMPACT

79. In your view, what are the most outstanding, most valuable positive differences the programme made to your research work / career?
80. Could you detect any negative consequences from the grant? How can these be avoided in future?

GENDER

81. Should TWAS do something differently to increase the number of female applicants? How about female grant winners?

ENVIRONMENT

82. What kinds of environmental dimensions does your project have? (E.g., does it have applications that could be used to address climate change or environmental issues?)

EXAMPLE OF INTERVIEW GUIDE FOR REGIONAL COORDINATORS

INTRODUCTORY REMARKS

- The interview is completely confidential. Any quotes that identify a person will need permission.
- Feel free to provide insights beyond what is asked, to ensure we capture what s/he considers important for the evaluation.
- Recommendation of others who might be crucial to interview.
- Opportunity to follow up, if necessary, especially where cross-checking or new information might be needed.

GUIDING QUESTIONS

TWAS mission and strategy.

83. Can you give us your perspective on the work of TWAS as you have observed it over the past five years – its ongoing relevance and importance given the rapid changes and trends across the world. Are there demands on science, and on the type of scientists that LDCs need now, that TWAS is addressing or still can do more to address?

Performance.

84. What is your assessment of what has been done and achieved in any of the components related to the Sida support (the Research Grants programme; the Regional Partners' work; the Science Diplomacy component and the focus on enhancing communications)? What has been outstanding? What should be improved? In your experience, what has been the main influences on its performance in general.

Defining success.

85. What would 'success' (or 'failure') mean in the context of a programme such as this?

Regional Partners.

86. Please share your experience as Regional Partner of TWAS. Does the concept of a Regional Partner work well? What worked well and what did not during implementation? How important has intra- and/or inter-regional cooperation been and how has this played out? What has been the most important influences – positive or negative - on the work as Regional Partner? How can this component be enhanced to be more valuable?

Approach to programming.

87. We are interested in the following issues in particular:
    a) The extent to which **coherence, synergy and/or complementarity** are being advanced in the programme. For example, how well does it relate to other TWAS programmes and initiatives such as GIS and OWSD? Is there merit for TWAS in connecting with national science academies or other bodies, perhaps through the Regional Partners' foci? Is this feasible and desirable - and to what extent has it been done?
    b) What have been the **main influences** on the extent to which synergies, etc. are advanced through the programming
    c) We notice that the Sida programme consists of a number of components and that the research grant value is quite small. Is this "**scattering"** a good and purposeful strategy?
    d) TWAS actions need to be **catalytic** as the funding, e.g. through Sida is relatively small. Is there something that Sida has been supporting, or can support in future, that can be considered as catalytic?

Approach to quality.

88. How would you define "quality" in the context of TWAS support to LDCs and STLCs? Where would you place publishing within this definition, and the relevance, usefulness or use of the research? Is there anything you would like to see done differently w.r.t. ensuring that TWAS supports and delivers research of quality? What influences notions of "quality" in TWAS?

Cross-cutting emphases – gender and environment.

89. Sida emphasises two cross-cutting themes: Environment and gender.
    a) In your experience, how well has gender been advanced in TWAS? Has it shown potential to be 'gender-transformative', or to support such work specifically? How does this relate to the work of OWSD and GIS? What have been the influences on what has been done in this regard?
    b) How can TWAS better support a focus on the environment? What influences its focus on this aspect?

The future – risks and opportunities.

90. What recommendations do you have to ensure that TWAS - through a programme such as that by funded by Sida - increases its relevance and potential for impact in future? Are there any emerging or potential risks to its work and impact? Any special opportunities?

Other.

91. Do you have any other observations as far as Sida's support to TWAS is concerned?

LIST OF QUESTIONS RELATED TO COMMUNICATIONS

RELEVANCE & SIGNIFICANCE

92. What has influenced the design of the communications practices and your focus areas? Why this specific approach? Was it necessary to make any trade-offs in its design or implementation?
93. How were the foci or themes for developing TWAS's communications decided upon? What were the criteria or principles for these decisions, and by whom? How satisfied are you that they address real priorities, and why?
94. What are the communication processes/practices that currently best support the different programme components / activities? Are different programme components better served by different communication channels or processes?
95. How would you develop the communication processes to better serve the different programme components?
96. How do you check and ensure the relevance of the different communications channels / modalities to the end users? (Who are the end users?)
97. What new channels or modalities of communication would you consider beneficial for TWAS?
98. Which modes of communication are the least used? Which would you end if you would have to close some?
99. What are the biggest challenges of communications regarding TWAS programmes / programme components? What global changes have there been in the communications world that have made you re-think your own practices?
100. What are the current communication trends in similar programmes?
101. Does PIO have enough resources to do fulfil the expectations from TWAS and funders?
102. What have the main development challenges with TWAS online forms been? How have you resolved those?

QUALITY

103. To what extent is the specific context of the researcher(s)/participants considered in communications?
104. Are there any trade-offs and compromises that you need to make and if so, what are the implications?
105. What measures / metrics guide your communication work? How do you measure the outreach and impact of TWAS communications? Any examples of how those are used to change how you work?
106. How do you collect feedback about TWAS online forms? Can you give examples of that data and how those data were used to improve the system?

COHERENCE

107. How do you coordinate TWAS communications work with OWS and GIS? Any others you coordinate with? (UNESCO? ISP? Etc.)

EFFECTIVENESS / EFFICIENCY

108. What worked well in the communications work since 2017? What did not? What have been main highlights? Any spectacular failures?
109. Any major concerns with respect to how the communications efforts have been (i) designed and (ii) implemented?
110. In your view, what are the main reasons for the (i) successes; (ii) less successful efforts in TWAS's communications?
111. Do you need to weigh the cost of different communication options and what impact do they deliver? How do you do that, if you do?
112. How visible are cross-cutting issues like gender and environment in TWAS communications?

IMPACT

113. In your view, what are the most outstanding, most valuable positive differences the communications team / PIO has made since 2017 / in your work? Why are these the most outstanding?
114. Are you aware of any surprises resulting from TWAS communications?
115. Were there any mistakes made over the programme period regarding TWAS communications? What consequences did they have?
116. Could you detect any negative consequences from the TWAS communications processes? How can these be avoided in future?

Annex 11: Survey Questionnaire Research Grants Component

TWAS Evaluation Research Grants

This is a survey for people **who won either an individual research grant or research units/group grant from TWAS in 2017–2021.**

The survey will take around 5-10 minutes to complete, and includes 4 sections. If you should leave the survey your answers will be saved, and you can complete it later. Once completed and submitted, you cannot change your answers or submit the survey again.

We kindly ask you to complete the questionnaire by May 25, 2021. Please note that your answers are completely confidential. Only the evaluation team will have access to the data, which is stored in compliance with European data legislation. The final report will present aggregate number, statistics, and anonymous quotes drawn from the data. If you have any difficulty in completing the survey, please contact evaluation@fcgsweden.se

We thank you kindly for your participation, your opinion is important to us!

The Evaluation Team
FCG Sweden

1. INFORMATION ABOUT YOU AND YOUR TWAS SUPPORT

Q1 What is your gender?

- ○ Male
- ○ Female
- ○ Prefer to self-describe: _____
- ○ Prefer not to say

Q2 What is your age?

- ○ Fill in a number: _____
- ○ Prefer not to say

Q3 What was your academic position when you won the grant?

- ○ Assistant lecturer
- ○ Instructor
- ○ Lecturer
- ○ Junior researcher
- ○ Researcher
- ○ Postdoc
- ○ Senior researcher
- ○ Assistant professor
- ○ Associate professor
- ○ Professor
- ○ Other (please specify) _____

Q4 What is your primary field of research?

- ○ Chemistry
- ○ Mathematics
- ○ Physics
- ○ Biology
- ○ Other (please specify) _____

Q5 How many years have you worked as a scientist and/or researcher (after obtaining doctoral degree)?

_____

Q6 This survey was sent to people who won either an individual research grant or research units/group grant from TWAS in 2017–2021. From which type of call did you receive your grant?

- ○ TWAS Research Grants Programme in Basic Sciences (Individuals)
- ○ TWAS Research Grants Programme in Basic Sciences (Groups)

Q7 In which country was your project located? (Select one from the drop-down list)

Q8 Did you win other grants or funding from TWAS in 2017–2021?

- ○ Yes (Please name the funding calls if you did) _____
- ○ No

Q9 Did you win other grants or funding from TWAS before 2017?

- ○ Yes (Please name the funding calls if you did) _____
- ○ No

2. YOUR RESEARCH PROJECT

Q10 To what extent do you agree or disagree with the following statements around the content of your research and the research process? (Tick one for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable/Not sure
I am familiar with other TWAS funding opportunities that I could use to support my research project.	○	○	○	○	○	○
The knowledge and experience gained in this project have direct application to improving one or more courses offered in my current university.	○	○	○	○	○	○
The equipment provided by the TWAS grant is for research purposes only and not used in undergraduate/graduate courses.	○	○	○	○	○	○
With the experience from this grant I plan to apply for jobs in a prestigious international university.	○	○	○	○	○	○
TWAS connected me with other TWAS-funded projects in my region.	○	○	○	○	○	○
My project actively collaborates with other TWAS-funded projects in my field. (If agree or strongly agree - please specify)	○	○	○	○	○	○

Q11 Has the TWAS grant helped you co-author articles or article manuscripts with other TWAS-funded projects?

- ○ No
- ○ Yes - Please list those co-authored articles: _____

Q12 What have been the main positive consequences (if any) of this grant to you and/or your institution?

_____

_____

Q13 What have been the main negative consequences (if any) of this grant to you and/or your institution?

_____

_____

Q14 Did you receive employment and/or a promotion as a result of your grant?

- ○ Yes (describe in the box if you did) _____
- ○ No

3. TWAS PROCESSES

Q15 To what extent do you agree or disagree with the following statements around the content of your research and the research process? (Tick one for each statement)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable/Not sure
TWAS should change what they fund currently (laboratory items, basic equipment, research literature, etc.) to better serve the needs of my research.	○	○	○	○	○	○
It would be better for TWAS to offer a few big grants than many small grants.	○	○	○	○	○	○
TWAS has helped me to coordinate or work in synergy with other similar projects in my field (not necessarily just TWAS-funded ones).	○	○	○	○	○	○

The TWAS research grantees network has greatly extended my international researcher networks.	○	○	○	○	○	○
TWAS was helpful to me for locating and applying for other grants to support my research.	○	○	○	○	○	○
Reporting requirements to TWAS (e.g. final report, research publications) have been light and not too time-consuming.	○	○	○	○	○	○
The support made available by TWAS grant was readily accessible, with limited administrative challenges.	○	○	○	○	○	○
The procurement process was fast.	○	○	○	○	○	○
The procurement process was clear for me.	○	○	○	○	○	○
Local bureaucracy did not considerably slow down delivery of items purchased by TWAS for me.	○	○	○	○	○	○
The process for using the additional contributions (conference funds, open-access fees, MSc student funds) was fast.	○	○	○	○	○	○
TWAS has made clear how their funded projects should promote gender equality and/or foster inclusion.	○	○	○	○	○	○
TWAS has made clear how their funded projects should address environmental questions and issues.	○	○	○	○	○	○

Q16 Compared to other similar grants by other grant funders, is there anything that made TWAS grant:

- ○ unique? _____
- ○ particularly valuable? _____
- ○ particularly problematic? _____

Q17 How would you change the TWAS grant options to better serve the needs of your research?

_____
_____

Q18 How would you change the procurement process to better serve your needs?

_____
_____

Q19 Please share any suggestions you have on how TWAS can improve their gender equality approach:

_____
_____

Q20 Did the TWAS grant have any 'ripple effects' of which you are aware? *That is, has it made a difference to you or to others perhaps in surprising ways, or lead to further actions beyond your immediate expectations?*

- ○ Yes (please describe) _____
- ○ No

4. INFORMING AND COMMUNICATING

Q21 Where did you first hear about TWAS grants?

- ○ TWAS website
- ○ Twitter
- ○ Facebook
- ○ Email
- ○ A friend or colleague
- ○ During an event (e.g. conference or workshop)
- ○ University or workplace channels
- ○ Other (please specify) _____

Q22 To what extent do you agree or disagree with the following statement? (Tick one)

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable/Not sure
I have easily found from TWAS website the information that I need.	○	○	○	○	○	○

Q23 Drag the following communication channels in the order of importance for you getting information from TWAS (1 - most important, 6 - the least):
_____ TWAS website
_____ Twitter
_____ Facebook
_____ TWAS Plus
_____ Email
_____ TWAS Research Links Network

Q24 Drag the following communication channels in the order of importance for you asking questions from TWAS (1 - most important, 6 - the least):
_____ TWAS website
_____ Twitter
_____ Facebook
_____ TWAS Plus
_____ Email
_____ TWAS Research Links Network

Q25 You have reached the end of the questionnaire.

Would you like to let us know of any other issues we did not cover earlier in the survey, or make any suggestions for improvement of TWAS Research Grants Programme?

_____

_____

Q26 The evaluation team is interested in contacting a limited number of survey respondents for a very short interview to follow up on some of these issues.
Would you be prepared to participate in such an interview? If yes, please provide your name and contact email.

_____

_____

This is the end of the questionnaire, we thank you warmly for having participated. Please click the right arrow below to submit your response.

Annex 12: Survey Questionnaire Regional Partners Component

TWAS Evaluation Regional Partners Survey

This is a survey for people **who participated in events organised by the Regional Partners of TWAS in the period of 2017-2021.**

The survey will take around 10 minutes to complete, and includes 5 sections. If you should leave the survey your answers will be saved, and you can complete it later. Once completed and submitted, you cannot change your answers or submit the survey again.

We kindly ask you to complete the questionnaire by June 5, 2021.

Please note that your answers are completely confidential. Only the evaluation team will have access to the data, which is stored in compliance with European data legislation. The final report will present aggregate number, statistics, and anonymous quotes drawn from the data. If you have any difficulty in completing the survey, please contact evaluation@fcgsweden.se
We thank you kindly for your participation, your opinion is important to us!
The Evaluation Team

FCG Sweden

1. INFORMATION ABOUT YOU AND YOUR TWAS SUPPORT
Q1 What is your gender?

- ○ Male
- ○ Female
- ○ Prefer to self-describe: _____
- ○ Prefer not to say

Q2 What is your age?

- ○ Fill in a number: _____
- ○ Prefer not to say

Q3 How many years have you worked as a scientist and/or researcher (after your graduate and/or postgraduate studies)?

_____

Q4 What is your primary field of research?

- ○ Chemistry
- ○ Mathematics
- ○ Physics
- ○ Biology
- ○ Other (please specify) _____

Q5 Country in which you were working when you received the support from TWAS? (Select one from the drop-down list)

Q6 Did you win other grants or funding from TWAS in 2017–2021?

- ○ Yes (Please name the funding calls if you did) _____
- ○ No

Q7 Did you win other grants or funding from TWAS before 2017?

- ○ Yes (Please name the funding calls if you did) _____
- ○ No

2. YOUR INTERACTIONS AND EXPECTATIONS

The following questions relate to your experience in interacting with the TWAS Regional Office(s) / Partner(s) between 2017-2021, and participating in one or more of the TWAS Regional Conferences for Young Scientists (RCYS).

Q8 Please indicate when you participated in the TWAS Regional Conference(s) for Young Scientists (you can choose multiple years if you attended more than one conference):

- ☐ 2017
- ☐ 2018
- ☐ 2019
- ☐ 2020
- ☐ Other/not applicable (please specify) _____

Q9 Please indicate the region in which the TWAS Regional Conference(s) for Young Scientists took place (you can choose multiple regions if you attended more than one conference):

- ☐ Latin America and the Caribbean
- ☐ East and South-East Asia and the Pacific
- ☐ Middle East/Arab Region
- ☐ Central and South Asia
- ☐ Sub-Saharan Africa
- ☐ Other/not applicable (please specify) _____

Q10 What motivated you to apply for participation in the Conference(s)? If you attended more than one conference, please explain your motivation for each one:

_____

_____

Q11 Considering all the Regional Conferences for Young Scientists you attended, to what extent were your expectations met?

- ○ Fully
- ○ To some extent
- ○ To a limited extent
- ○ Not at all

Question 11a is displayed if the respondent did not answer "fully" in Question 11.
Q11a If your expectations were not fully met, what were the reasons?

_____

_____

Q12 In your view, and/or compared to similar events organised by others, is there anything that made one or more of these Conferences:

- ○ **unique?** (Yes/No. Please explain your response.) _____
- ○ **particularly valuable?** (Yes/No. Please explain your response.) _____
- ○ **particularly problematic?** (Yes/No. Please explain your response.)_____

Q13 How many days did it take on average to receive responses to requests for information from the organisers of the Conference(s)?

- ○ 0-1 day
- ○ 2-3 days
- ○ More than 3 days

14 To what extent do you agree or disagree with the following statements? (Tick one for each statement):

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable/Not sure
The topics covered in the Conference(s) were relevant to the development goals and policies of the country and/or region where I work.	○	○	○	○	○	○
The topics covered in the Conference(s) helped me to get a better understanding of scientific issues affecting my region.	○	○	○	○	○	○
The topics covered in the Conference(s) were directly applicable to my scientific work at that time.	○	○	○	○	○	○
I easily found the information I needed from TWAS Regional Partner(s).	○	○	○	○	○	○
The Conference(s) were efficiently organised.	○	○	○	○	○	○
I am aware of other TWAS funding opportunities that I can use to support my research.	○	○	○	○	○	○
A conference aimed at young scientists should be a high priority, even for funders with limited financial support for scientific work.	○	○	○	○	○	○

3. IMPACT OF THE CONFERENCE(S)

Q15 When you consider the Regional Conference for Young Scientists you found MOST useful or that had the MOST impact on your career, please list three different terms that best describe your experience *(for example – useful, disappointing, life-changing, irrelevant, of little relevance, inspiring, uninspiring, conventional, innovative, etc.)*

○ 1 _____

○ 2 _____

○ 3 _____

Q16 When you consider the Regional Conference for Young Scientists you found LEAST useful or that had the LEAST impact on your career, please list three different terms that best describe your experience *(for example – useful, disappointing, life-changing, irrelevant, of little relevance, inspiring, uninspiring, conventional, innovative, etc.)*

○ 1 _____

○ 2 _____

○ 3 _____

Q17 Did you have any other interactions with the Regional Office/Partners beyond the(se) Conference(s)?

○ Yes

○ No

Q18 Did the Regional Office/Partners provide you with any other forms of support beyond the(se) Conference(s)?

○ Yes

○ No

Question 18a is displayed if the respondent answered "Yes" to question 18.

Q18a Please give details, including how valuable such support (apart from the Conference(s)) has been for your interests or career.

_____

_____

Q19 Was there anything negative about the Conference(s), or about their consequences, that you want to point out to the evaluation team?

○ No

○ Yes (please describe) _____

If you participated in more than one Conference, for the next questions please limit your specific comments to the one that you found MOST USEFUL or had the MOST IMPACT on your career.

Q20 To what extent do you agree or disagree with the following statements? (Tick one for each statement):

	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree	Not applicable/Not sure
The Conference inspired and motivated me in my scientific work.	○	○	○	○	○	○
The Conference helped me to find one or more persons in my region working in a similar area.	○	○	○	○	○	○
The Conference has helped me to collaborate with others with the same interests.	○	○	○	○	○	○
The Conference helped me to connect to a senior scientist who has given me mentoring support.	○	○	○	○	○	○
What I learned at the conference is still applicable to my scientific work.	○	○	○	○	○	○

Q21 What would you say has been the single most outstanding benefit (if any) that you gained from this Conference? Please provide some details that explain your response.

_____

_____

Q22 Do you continue to benefit from this Conference?

○ Yes - please describe what way(s). _____

○ No - please describe why. _____

Q23 Did the Conference have any 'ripple effects' of which you are aware? *That is, has it made a difference to you or to others in surprising ways, or lead to further actions by yourself or others beyond your immediate expectations?*

○ Yes - please provide some details. _____

○ No

4. INFORMING AND COMMUNICATING

Q24 Drag the following communication channels in the order of importance for you getting information about TWAS (1 - most important, 6 - least important):

_____ TWAS plus
_____ Twitter
_____ Facebook
_____ TWAS website
_____ Email
_____ TWAS Research Links Network

Q25 Drag the following communication channels in the order of importance for you asking questions from TWAS (1 - most important, 6 - least important):

_____ TWAS Plus
_____ Twitter
_____ Facebook
_____ TWAS website
_____ Email
_____ TWAS Research Links Network

RECOMMENDATIONS AND FOLLOW-UP

Q26 You have reached the end of the questionnaire.
Do you have any suggestions for improvement of the Regional Conferences for Young Scientists, or about how TWAS can best support young scientists at this time for the benefit of yourself, your institution and country?

_____
_____

Q27 The evaluation team is interested in contacting a limited number of survey respondents for a very short interview to follow up on some of these issues.

Would you be prepared to participate in such an interview? If yes, please provide your name and contact email.

_____
_____

This is the end of the questionnaire, we thank you warmly for having participated. Please click the right arrow below to submit your response.

Annex 13: Survey Data Research Grants Component

Below is the summary of quantitative results for the Research Grants survey. The qualitative results are available upon request. Not all questions in the survey were mandatory, and certain respondents only completed a part of the survey, so the response rates on certain questions can differ.

TWAS Evaluation Research Grants

Q1 - What is your gender?

Answer	%	Count
Male	58.79%	97
Female	31.52%	52
Prefer to self-describe:	6.67%	11
Prefer not to say	3.03%	5
Total	**100%**	**165**

Q2 - What is your age?

	Average age
Individuals and Groups	42.1
Individuals	40.1
Groups	46.6

Q3 - What was your academic position when you won the grant?

Answer	%	Count
Assistant lecturer	3.03%	5
Instructor	0.00%	0
Lecturer	20.61%	34
Junior researcher	1.82%	3
Researcher	10.91%	18
Postdoc	4.85%	8

Senior researcher	8.48%	14
Assistant professor	14.55%	24
Associate professor	19.39%	32
Professor	9.70%	16
Other (please specify)	6.67%	11
Total	**100%**	**165**

Q4 - What is your primary field of research?

Answer	%	Count
Chemistry	26.67%	44
Mathematics	9.09%	15
Physics	17.58%	29
Biology	35.15%	58
Other (please specify)	11.52%	19
Total	**100%**	**165**

Q5 - How many years have you worked as a scientist and/or researcher (after obtaining doctoral degree)?

	Mean working years
Individuals and Groups	8.3
Individuals	6.9
Groups	11.3

Q6 - This survey was sent to people who won either an individual research grant or research units/group grant from TWAS in 2017–2021. From which type of call did you receive your grant?

Answer	%	Count
TWAS Research Grants Programme in Basic Sciences (Individuals)	71.18%	121
TWAS Research Grants Programme in Basic Sciences (Groups)	28.82%	49
Total	**100%**	**170**

Q7 - In which country was your project located?

Answer	%	Count
Bangladesh	19.53%	33
Nepal	8.28%	14
Cameroon	7.69%	13
Benin	7.10%	12
Kenya	6.51%	11
Ghana	4.14%	7
Tanzania	3.55%	6
Uganda	3.55%	6
Sri Lanka	3.55%	6
Burkina Faso	3.55%	6
Togo	2.96%	5
Ethiopia	2.96%	5
Mongolia	2.96%	5
Rwanda	2.37%	4
Senegal	2.37%	4
Sudan	2.37%	4
Congo, Republic of the...	2.37%	4
Zimbabwe	1.78%	3
Niger	1.78%	3
Bolivia	1.78%	3
Malawi	1.78%	3
Madagascar	1.18%	2
Paraguay	1.18%	2
Angola	0.59%	1
Guatemala	0.59%	1
Suriname	0.59%	1
Swaziland	0.59%	1
Côte d'Ivoire	0.59%	1
Mali	0.59%	1
Burundi	0.59%	1
Zambia	0.59%	1
Total	**100%**	**169**

Q8 - Did you win other grants or funding from TWAS in 2017-2021?

#	Answer	%	Count
1	Yes (Please name the funding calls if you did)	18.24%	31
2	No	81.76%	139
	Total	**100%**	**170**

Q9 - Did you win other grants or funding from TWAS before 2017?

#	Answer	%	Count
1	Yes (Please name the funding calls if you did)	20.00%	34
2	No	80.00%	136
	Total	**100%**	**170**

Q10 - To what extent do you agree or disagree with the following statements around the content of your research and the research process? (Tick one for each statement)

iii. I am familiar with other TWAS funding opportunities that I could use to support my research project.
iv. The knowledge and experience gained in this project have direct application to improving one or more courses offered in my current university.
v. The equipment provided by the TWAS grant is for research purposes only and not used in undergraduate/graduate courses.
vi. With the experience from this grant I plan to apply for jobs in a prestigious international university.
vii. TWAS connected me with other TWAS-funded projects in my region.
viii. My project actively collaborates with other TWAS-funded projects in my field. (If agree or strongly agree - please specify)

#	Answer	%	Count
1	Strongly disagree	4.71%	8
2	Disagree	25.88%	44
3	Neither agree nor disagree	20.59%	35
4	Agree	20.00%	34
5	Strongly agree	11.76%	20
6	Not applicable/Not sure	17.06%	29
Total		**100%**	**170**

Q11 - Has the TWAS grant helped you co-author articles or article manuscripts with other TWAS-funded projects?

#	Answer	%	Count
1	No	77.51%	131
2	Yes - Please list those co-authored articles:	22.49%	38
Total		**100%**	**169**

Q12 What have been the main positive consequences (if any) of this grant to you and/or your institution?

The qualitative results are available upon request.

Q13 What have been the main negative consequences (if any) of this grant to you and/or your institution?

The qualitative results are available upon request.

Q14 - Did you receive employment and/or a promotion as a result of your grant?

#	Answer	%	Count
1	Yes (describe in the box if you did)	36.69%	62
2	No	63.31%	107
	Total	**100%**	**169**

Q15 - To what extent do you agree or disagree with the following statements around the content of your research and the research process? (Tick one for each statement)

#	Question	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree		Not applicable / Not sure		Total
1	TWAS should change what they fund currently (laboratory items, basic equipment, research literature, etc.) to better serve the needs of my research.	18.93%	32	37.87%	64	12.43%	21	15.38%	26	13.02%	22	2.37%	4	169
2	It would be better for TWAS to offer a few big grants than many small grants.	20.71%	35	23.08%	39	14.20%	24	19.53%	33	20.71%	35	1.78%	3	169
3	TWAS has helped me to coordinate or work in synergy with other similar projects in my field (not necessarily just TWAS-funded ones).	1.18%	2	8.88%	15	10.06%	17	42.60%	72	31.36%	53	5.92%	10	169
4	The TWAS research grantees network has greatly extended my international researcher networks.	0.00%	0	7.10%	12	20.71%	35	34.91%	59	31.36%	53	5.92%	10	169

5	TWAS was helpful to me for locating and applying for other grants to support my research.	2.37%	4	9.47%	16	14.79%	25	36.09%	61	30.18%	51	7.10%	12	169
6	Reporting requirements to TWAS (e.g. final report, research publications) have been light and not too time-consuming.	2.37%	4	2.96%	5	14.79%	25	34.91%	59	31.36%	53	13.61%	23	169
7	The support made available by TWAS grant was readily accessible, with limited administrative challenges.	4.73%	8	5.92%	10	7.10%	12	34.91%	59	44.97%	76	2.37%	4	169
8	The procurement process was fast.	5.92%	10	11.24%	19	5.92%	10	36.09%	61	38.46%	65	2.37%	4	169
9	The procurement process was clear for me.	3.55%	6	7.10%	12	5.92%	10	36.09%	61	45.56%	77	1.78%	3	169
10	Local bureaucracy did not considerably slow down delivery of items purchased by TWAS for me.	10.65%	18	17.16%	29	6.51%	11	27.81%	47	34.32%	58	3.55%	6	169
11	The process for using the additional contributions (conference funds, open-access fees, MSc student funds) was fast.	3.55%	6	2.37%	4	18.34%	31	23.08%	39	29.59%	50	23.08%	39	169
12	TWAS has made clear how their funded projects should promote gender equality and/or foster inclusion.	0.59%	1	1.78%	3	16.57%	28	42.01%	71	31.95%	54	7.10%	12	169
13	TWAS has made clear how their funded projects should address environmental questions and issues.	0.00%	0	1.18%	2	18.93%	32	39.05%	66	32.54%	55	8.28%	14	169

Q16 Compared to other similar grants by other grant funders, is there anything that made TWAS grant: unique? particularly valuable? particularly problematic?

The qualitative results are available upon request.

Q17 How would you change the TWAS grant options to better serve the needs of your research?

The qualitative results are available upon request.

Q18 How would you change the procurement process to better serve your needs?

The qualitative results are available upon request.

Q19 Please share any suggestions you have on how TWAS can improve their gender equality approach:

The qualitative results are available upon request.

Q20 - Did the TWAS grant have any 'ripple effects' of which you are aware? That is, has it made a difference to you or to others perhaps in surprising ways, or lead to further actions beyond your immediate expectations?

#	Answer	%	Count
1	Yes (please describe)	41.21%	68
2	No	58.79%	97
	Total	**100%**	**165**

Q21 - Where did you first hear about TWAS grants?

#	Answer	%	Count
1	Twitter	0.59%	1
2	Facebook	0.59%	1
4	Email	7.10%	12
5	Other (please specify)	2.37%	4
6	TWAS website	43.79%	74
7	A friend or colleague	36.69%	62
8	During an event (e.g. conference or workshop)	1.18%	2
9	University or workplace channels	7.69%	13
	Total	**100%**	**169**

Q22 - To what extent do you agree or disagree with the following statement? (Tick one)

I have easily found from TWAS website the information that I need.

#	Answer	%	Count
1	Strongly disagree	3.55%	6
2	Disagree	0.59%	1
3	Neither agree nor disagree	1.18%	2
4	Agree	36.69%	62
5	Strongly agree	57.99%	98
6	Not applicable/Not sure	0.00%	0
Total		**100%**	**169**

Q23 Drag the following communication channels in the order of importance for you getting information from TWAS (1 - most important, 6 - the least): TWAS website, Twitter, Facebook, TWAS Plus, Email, TWAS Research Links Network.

Results are available upon request.

Q24 Drag the following communication channels in the order of importance for you asking questions from TWAS (1 - most important, 6 - the least): TWAS website, Twitter, Facebook, TWAS Plus, Email, TWAS Research Links Network.

Results are available upon request.

Q25 You have reached the end of the questionnaire. Would you like to let us know of any other issues we did not cover earlier in the survey, or make any suggestions for improvement of TWAS Research Grants Programme?

Results are available upon request.

Annex 14: Survey Data Regional Partners Component

Below is the summary of quantitative results for the survey on events organised by TWAS Regional Partners. The qualitative results are available upon request. Not all questions in the survey were mandatory, and certain respondents only completed a part of the survey, so the response rates on certain questions can differ.

TWAS Evaluation Regional Partners

Q1 - What is your gender?

Answer	%	Count
Male	50.75%	34
Female	35.82%	24
Prefer to self-describe:	7.46%	5
Prefer not to say	5.97%	4
Total	**100%**	**67**

Q2 - What is your age?

	Average age	Count
Prefer not to say	-	3
Fill in a number	36.3	63

Q3 - How many years have you worked as a scientist and/or researcher (after your graduate and/or postgraduate studies)?

Mean working years	7.5

Q4 - What is your primary field of research?

Answer	%	Count
Chemistry	13.43%	9
Mathematics	4.48%	3
Physics	10.45%	7

Biology	32.84%	22
Other (please specify)	38.81%	26
Total	**100%**	**67**

Q5 - Country in which you were working when you received the support from TWAS?

Answer	%	Count
Kenya	25.37%	17
India	8.96%	6
Bangladesh	7.46%	5
South Africa	4.48%	3
Honduras	4.48%	3
Egypt	4.48%	3
Cameroon	4.48%	3
Nigeria	2.99%	2
Nepal	2.99%	2
Lesotho	2.99%	2
Uganda	2.99%	2
Guatemala	2.99%	2
Ethiopia	2.99%	2
Zimbabwe	2.99%	2
Burkina Faso	1.49%	1
Rwanda	1.49%	1
Nicaragua	1.49%	1
Benin	1.49%	1
Mozambique	1.49%	1
Senegal	1.49%	1
Malawi	1.49%	1
Lebanon	1.49%	1
Bolivia	1.49%	1
Haiti	1.49%	1
Ghana	1.49%	1
Eritrea	1.49%	1
Sri Lanka	1.49%	1
Total	**100%**	**67**

Q6 - Did you win other grants or funding from TWAS in 2017–2021?

#	Answer	%	Count
1	Yes (Please name the funding calls if you did)	22.39%	15
2	No	77.61%	52
	Total	**100%**	**67**

Q7 - Did you win other grants or funding from TWAS before 2017?

#	Answer	%	Count
1	Yes (Please name the funding calls if you did)	10.45%	7
2	No	89.55%	60
Total		**100%**	**67**

Q8 - Please indicate when you participated in the TWAS Regional Conference(s) for Young Scientists (possible to choose multiple years):

#	Answer	%	Count
1	2017	22.22%	16
2	2018	18.06%	13
4	2019	52.78%	38
5	2020	5.56%	4
6	Other/not applicable (please specify)	1.39%	1
Total		**100%**	**72**

Q9 - Please indicate the region in which the TWAS Regional Conference(s) for Young Scientists took place (you can choose multiple regions if you attended more than one conference):

#	Answer	%	Count
1	Latin America and the Caribbean	10.61%	7
2	East and South-East Asia and the Pacific	16.67%	11
3	Middle East/Arab Region	4.55%	3
4	Central and South Asia	16.67%	11
5	Sub-Saharan Africa	45.45%	30
6	Other/not applicable (please specify)*	6.06%	4
Total		**100%**	**66**

* The qualitative results are available upon request.

Q10 What motivated you to apply for participation in the Conference(s)? If you attended more than one conference, please explain your motivation for each one:

The qualitative results are available upon request.

Q11 - Considering all the Regional Conferences for Young Scientists you attended, to what extent were your expectations met?

#	Answer	%	Count
1	Fully	55.22%	37
2	To some extent	38.81%	26
3	To a limited extent	5.97%	4
4	Not at all	0.00%	0
	Total	**100%**	**67**

Q12 In your view, and/or compared to similar events organised by others, is there anything that made one or more of these Conferences: unique? particularly valuable? particularly problematic? (Yes/No. Please explain your response.)

The qualitative results are available upon request.

Q13 - How many days did it take on average to receive responses to requests for information from the organisers of the Conference(s)?

#	Answer	%	Count
1	0-1 day	33.85%	22
2	2-3 days	50.77%	33
3	More than 3 days	15.38%	10
	Total	**100%**	**65**

Q14 - To what extent do you agree or disagree with the following statements? (Tick one for each statement):

#	Question	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree		Not applicable / Not sure		Total
1	The topics covered in the Conference(s) were relevant to the development goals and policies of the country and/or region where I work.	6.15%	4	1.54%	1	3.08%	2	40.00%	26	49.23%	32	0.00%	0	65
2	The topics covered in the Conference(s) helped me to get a better understanding of scientific issues affecting my region.	6.15%	4	0.00%	0	7.69%	5	35.38%	23	50.77%	33	0.00%	0	65
3	The topics covered in the Conference(s) were directly applicable to my scientific work at that time.	3.08%	2	7.69%	5	4.62%	3	43.08%	28	40.00%	26	1.54%	1	65
4	I easily found the information I needed from TWAS Regional Partner(s).	6.15%	4	7.69%	5	9.23%	6	38.46%	25	33.85%	22	4.62%	3	65
5	The Conference(s) were efficiently organised.	4.62%	3	3.08%	2	4.62%	3	32.31%	21	52.31%	34	3.08%	2	65
6	I am aware of other TWAS funding opportunities that I can use to support my research.	3.08%	2	21.54 %	14	13.85%	9	26.15%	17	26.15%	17	9.23%	6	65
7	A conference aimed at young scientists should be a high priority, even for funders with limited financial support for scientific work.	4.62%	3	0.00%	0	1.54%	1	18.46%	12	70.77%	46	4.62%	3	65

Q15 When you consider the Regional Conference for Young Scientists you found MOST useful or that had the MOST impact on your career, please list three different terms that best describe your experience (for example – useful, disappointing, life-changing, irrelevant, of little relevance, inspiring, uninspiring, conventional, innovative, etc.)

The qualitative results are available upon request.

Q16 When you consider the Regional Conference for Young Scientists you found LEAST useful or that had the LEAST impact on your career, please list three different terms that best describe your experience (for example – useful, disappointing, life-changing, irrelevant, of little relevance, inspiring, uninspiring, conventional, innovative, etc.)

The qualitative results are available upon request.

Q17 - Did you have any other interactions with the Regional Office/Partners beyond the(se) Conference(s)?

#	Answer	%	Count
1	Yes	40.63%	26
2	No	59.38%	38
	Total	**100%**	**64**

Q18 - Did the Regional Office/Partners provide you with any other forms of support beyond the(se) Conference(s)?

#	Answer	%	Count
1	Yes	29.69%	19
2	No	70.31%	45
	Total	**100%**	**64**

Q19 - Was there anything negative about the Conference(s), or about their consequences, that you want to point out to the evaluation team?

#	Answer	%	Count
1	No	79.69%	51
2	Yes (please describe)	20.31%	13

Total	**100%**	**64**

Q20 - To what extent do you agree or disagree with the following statements? (Tick one for each statement):

#	Question	Strongly disagree		Disagree		Neither agree nor disagree		Agree		Strongly agree		Not applicable / Not sure		Total
1	The Conference inspired and motivated me in my scientific work.	3.17%	2	1.59%	1	4.76%	3	36.51%	23	50.79%	32	3.17%	2	63
2	The Conference helped me to find one or more persons in my region working in a similar area.	1.59%	1	4.76%	3	12.70%	8	42.86%	27	33.33%	21	4.76%	3	63
3	The Conference has helped me to collaborate with others with the same interests.	1.59%	1	9.52%	6	17.46%	11	41.27%	26	25.40%	16	4.76%	3	63
4	The Conference helped me to connect to a senior scientist who has given me mentoring support.	1.59%	1	28.57%	18	17.46%	11	17.46%	11	31.75%	20	3.17%	2	63
5	What I learned at the conference is still applicable to my scientific work.	3.17%	2	1.59%	1	9.52%	6	46.03%	29	36.51%	23	3.17%	2	63

Q21 What would you say has been the single most outstanding benefit (if any) that you gained from this Conference? Please provide some details that explain your response.

The qualitative results are available upon request.

Q22 - Do you continue to benefit from this Conference?

#	Answer	%	Count
1	Yes - please describe what way(s).	65.52%	38
2	No - please describe why.	34.48%	20
Total		**100%**	**58**

Q23 - Did the Conference have any 'ripple effects' of which you are aware? That is, has it made a difference to you or to others in surprising ways, or lead to further actions by yourself or others beyond your immediate expectations?

#	Answer	%	Count
1	Yes - please provide some details.	43.10%	25
2	No	56.90%	33
Total		**100%**	**58**

Q24 Drag the following communication channels in the order of importance for you getting information about TWAS (1 - most important, 6 - least important): TWAS Plus, Twitter, Facebook, TWAS website, Email, TWAS Research Links Network

The qualitative results are available upon request.

Q25 Drag the following communication channels in the order of importance for you asking questions from TWAS (1 - most important, 6 - least important): TWAS Plus, Twitter, Facebook, TWAS website, Email, TWAS Research Links Network

The qualitative results are available upon request.

Q26 You have reached the end of the questionnaire. Do you have any suggestions for improvement of the Regional Conferences for Young Scientists, or about how TWAS can best support young scientists at this time for the benefit of yourself, your institution and country?

The qualitative results are available upon request.

Annex 15: Communication Analytics Data

SURVEY DATA OF THE WEBSITE

Analysis of the survey of from the grant recipients' and the partners' responses to questions "Rate the following communication channels in the order of importance for you getting information from TWAS (1 - most important, 6 - the least), the options included: the website, Twitter, Facebook, TWAS Plus, Email and Research links network". The analysis for such questions included the mode (the most frequent choice) and the mean (the average rating by all users). The data were obtained from the grant applicants (n=170) and partners (n=58).

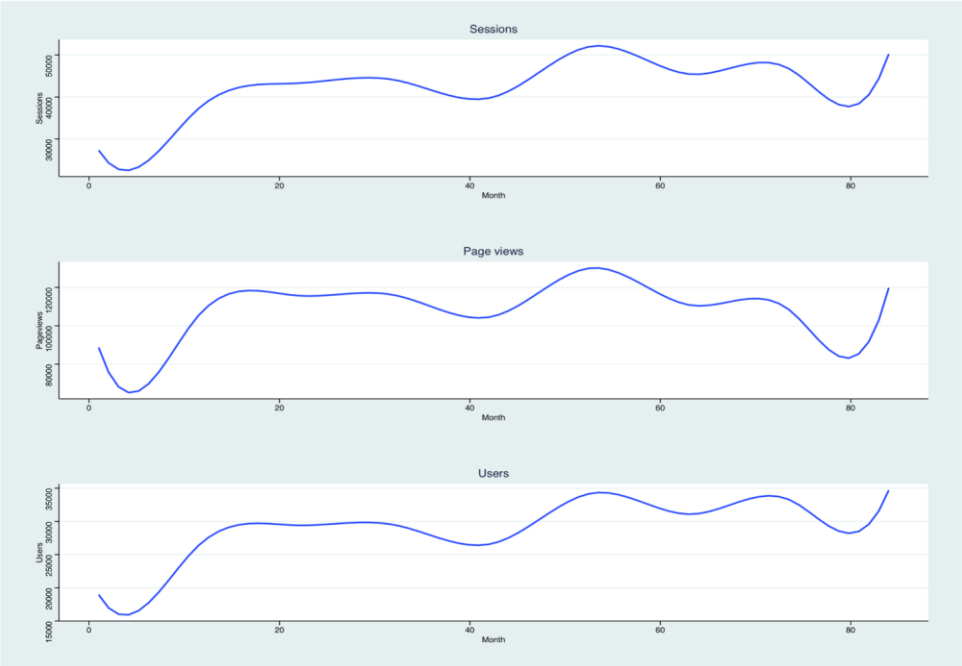
Table 1: Average and mode (most frequent responses) responses for which channel users rate the most frequently used (1 is highest, and 6 is lowest)

Responders	Type	Statistic	Website	Twitter	Facebook	TWAS Plus	Email	Research links
Grants	Seeking Information	Average	1.6	4.7	4.7	4.1	2.4	3.5
	Seeking Information	Mode	1	6	5	4	1	3
Partners	Seeking Information	Average	2.6	4.6	4.5	3.7	1.7	3.8
	Seeking Information	Mode	2	6	5	4	1	3
Partners	Asking Questions	Average	2.9	4.4	4.4	3.4	1.7	4.1
	Asking Questions	Mode	2	5	6	4	1	6

TREND DATA OF THE WEBSITE

Google analytics dashboard data were obtained from 2014-06-01 to May 2021 and analysed. The statistics show that each user has an average of 2.6 sessions, for an average duration of 3:21 minutes. The website has 2% average growth rate, with the last two years experiencing a declining session growth rate -2.6%, and -4.9% respectively, the result of previously most active countries removed from the list of TWAS TSLCs. Similarly, the average growth rate of users visiting the site was 2%, with the last two years declining with a -1% and -4% growth rate respectively. The average growth rate for number of visited pages was -1.7%, and the last two years were the lowest in growth rate in percentage -7% and -12%. The plot in figure (2) shows the trend over 84 months of recorded data (sessions, page views and users). The trends in the three plots, shows a rising trend in the beginning (until month 40) and decreasing trend starting from around month 50.

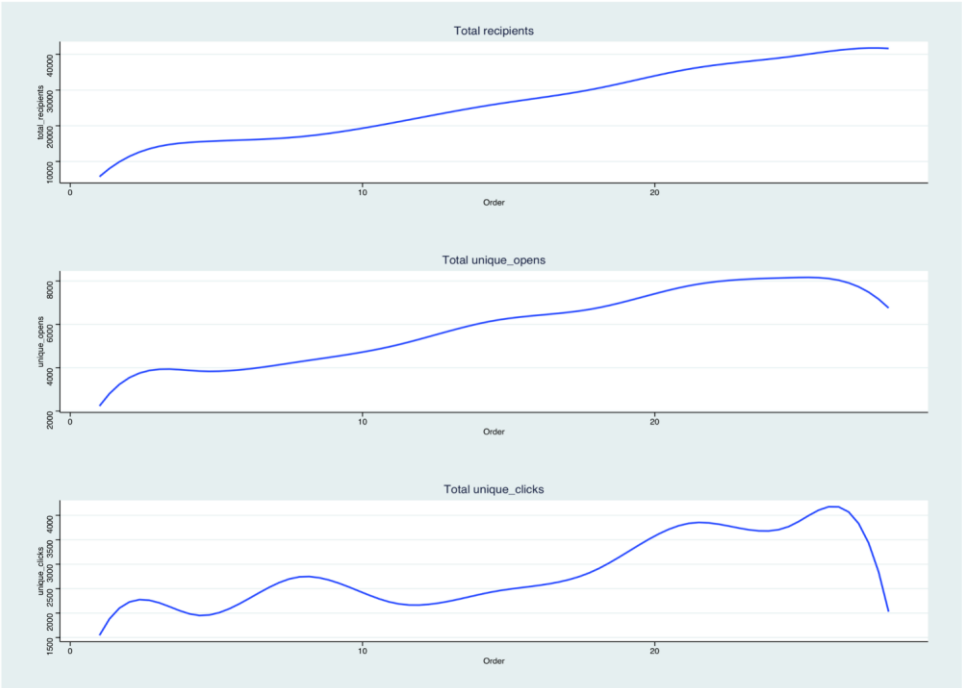
Figure 1: Trend of website sessions, page views and users over 84 months.



TREND DATA OF THE NEWSLETTER

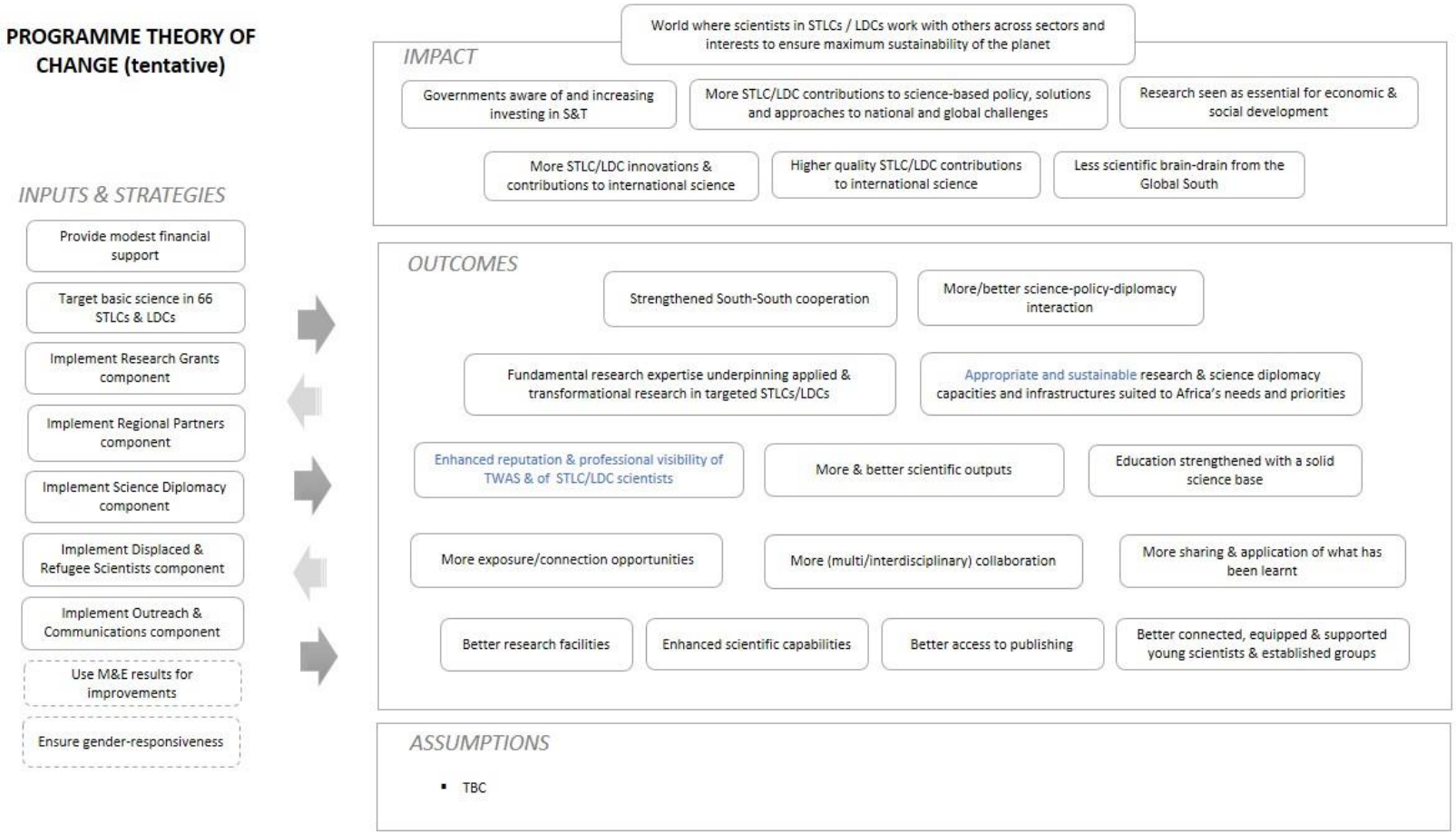
The newsletter data were downloaded from Mailchimp, campaigns with less than 10 users were excluded since they represented test campaigns. The analysis included the growth rates and average growth rates of total recipients, total recipients, and unique clicks by users. The plots in Figure 2 shows the trends of each.

Figure 2: Trend of newsletter recipients, unique opens, and total clicks over 84 months.



Annex 16: Retrospectively Developed Theories of Change

These Theories of Change were developed retrospectively for use by the Evaluation Team.



SCIENCE GRANTS COMPONENT draft ToC

INPUTS & STRATEGIES

- Provide modest financial support
- Support excellent young individuals in basic science in STLCs/LDCs
- Support Research Units / established PIs in basic science in STLCs/LDCs
- Focus on equipment, consumables, publishing
- Support Masters students (in Research Units)
- Establish TWAS Research Grants Alumni Network
- Organise TWAS Research Grants Regional Conference / Events (2020)
- Connect with TWAS Young Affiliates and Fellows
- Use M&E results used for improvements
- Communicate with participants, journalists, policymakers, educators, public
- Ensure gender-responsiveness

IMPACT

- World where scientists in STLCs / LDCs work with others across sectors and interests to ensure maximum sustainability of the planet
- More STLC/LDC contributions to science-based policy, solutions and approaches to national and global challenges
- More STLC/LDC contributions to international science
- Higher quality STLC/LDC contributions to international science
- Less scientific brain-drain from the Global South

OUTCOMES

- STATE: Education strengthened with a solid science base
- STATE: Enhanced reputation & professional visibility of TWAS & of STLC/LDC scientists
- STATE: Better connected (young) scientists
- STATE: More STLC/LDC publications
- STATE: Better equipped and supported young scientists with MSc and PhD degrees
- ACTION: More research activity
- ACTION: More (multi/interdisciplinary) collaborations, groups & international consortia working on more complex scientific projects
- ACTION: More data & information sharing
- STATE: Better research facilities
- CAPABILITIES: Enhanced scientific insight, know-how, troubleshooting

PRECONDITIONS & ASSUMPTIONS

- Basic infrastructure for performing the foreseen research is adequate at the host institutions
- Local bureaucracy does not delay delivery of equipment
- Equipment is delivered to the Awardee's institute
- Awardees provide final reports in a timely manner
- Awardees respond to surveys
- TBC

REGIONAL PARTNERS COMPONENT draft ToC

INPUTS & STRATEGIES

- Provide modest financial support
- Regional Partners expertise & in-kind contributions
- Hold annual conference (workshops & events 2020)
- Target young scientists in region, half STLCs/LDCs
- Showcase scientific work
- Create linkages with TWAS grants and Fellows
- Leverage additional funds
- Engage senior scientists as mentors at event
- Use M&E results for improvements
- Communicate with participants, journalists, policymakers, educators, public
- Ensure gender responsiveness

IMPACT

- World where scientists in STLCs / LDCs work with others across sectors and interests to ensure maximum sustainability of the planet
- More STLC/LDC contributions to science-based policy, solutions and approaches to national and global challenges
- More STLC/LDC contributions to international science
- Higher quality STLC/LDC contributions to international science
- Less scientific brain-drain from the Global South

OUTCOMES

- STATE: Better research by young scientists in targeted countries
- ACTION: Application of new insights by young scientists in their scientific work
- ACTION: More collaboration among young and with senior scientists, incl. mentoring
- INSIGHT/AWARENESS: Better understanding of scientific issues affecting the Global South
- CAPABILITIES: Increased inspiration, direction and motivation among young scientists
- INSIGHT/KNOWLEDGE: Improved troubleshooting in scientific work
- INSIGHT/AWARENESS: Better understanding of scientific activities in similar areas in region

PRECONDITIONS & ASSUMPTIONS

- Dissemination by RP will be efficient and reach target groups
- Selection of conference participants has been based on merit & scientific experience
- TWAS fellows will participate and ensure a good level of scientific discussion
- Resource personnel for add-on (grant-writing) workshops are qualified and available
- Other organisations request to hold add-on workshops
- TBC

SCIENCE DIPLOMACY COMPONENT draft ToC

IMPACT

World where policymakers & scientists in targeted countries work collaboratively to ensure maximum sustainability of the planet

- Support to SDGs / SDG 17
- Influence on (foreign) policy / (Foreign) policy changes based on science advice
- TWAS considered 'go-to' organisation for science diplomacy, esp. w.r.t S-S and S-N/N-S relations

INPUTS & STRATEGIES

- Create young scientist diplomacy fellowships in targeted STLCs/LDCs
- Launch campaigns on role of science in diplomacy
- Hold annual diplomacy summer courses & regional workshops
- Establish science diplomacy network
- Organise alumni conference
- Appoint science diplomacy ambassadors
- Use M&E results for improvements
- Communicate with participants, journalists, policymakers, educators, public
- Ensure gender responsiveness

OUTCOMES

STATE: More/better science-policy-diplomacy bridges

- CAPABILITY: Increased science diplomacy capacities in targeted countries
- ACTION/BEHAVIOUR: Increased action in communicating science, promoting indigenous science capacities & science advice to policymakers
- ACTION/BEHAVIOUR: Scientists get & create opportunities to apply what they have learnt
- INSIGHT/AWARENESS: Increased awareness of value of science diplomacy in Global South
- MOTIVATION/AWARENESS: Increased interest in science diplomacy & the TWAS programme
- INSIGHT/KNOWLEDGE: Diplomats/policymakers informed of science advances & how science can assist in negotiations
- INSIGHT/KNOWLEDGE: Young scientists informed of concepts of science diplomacy, see wider research implications

PRECONDITIONS & ASSUMPTIONS

- *Additional funds secured from other partners, incl. AAAS co-hosting*
- *Regional partners able to access local funding*
- Policymakers take long term view
- Policymakers & scientists are aware of mutual interdependency
- More uniform distribution of scientific capacity needed to bring about sustainable world
- Knowledgeable speakers attracted
- Context-sensitive, state of the art insights shared about science/policy interface
- Scientists have appropriate opportunities to use their new knowledge
- Women scientists will apply
- TBC

REFUGEE & DISPLACED SCIENTISTS COMPONENT draft ToC

INPUTS & STRATEGIES

- Partnership between TWAS, IAP, ISC, IS
- Provide modest financial support
- Launch website, study & strategic plan
- Set working groups in place
- Hold planning workshops
- Use M&E results for improvements
- Ensure gender responsiveness

IMPACT

World where scientists in STLCs / LDCs work with others across sectors and interests to ensure maximum sustainability of the planet

- TBC
- TBC
- TBC

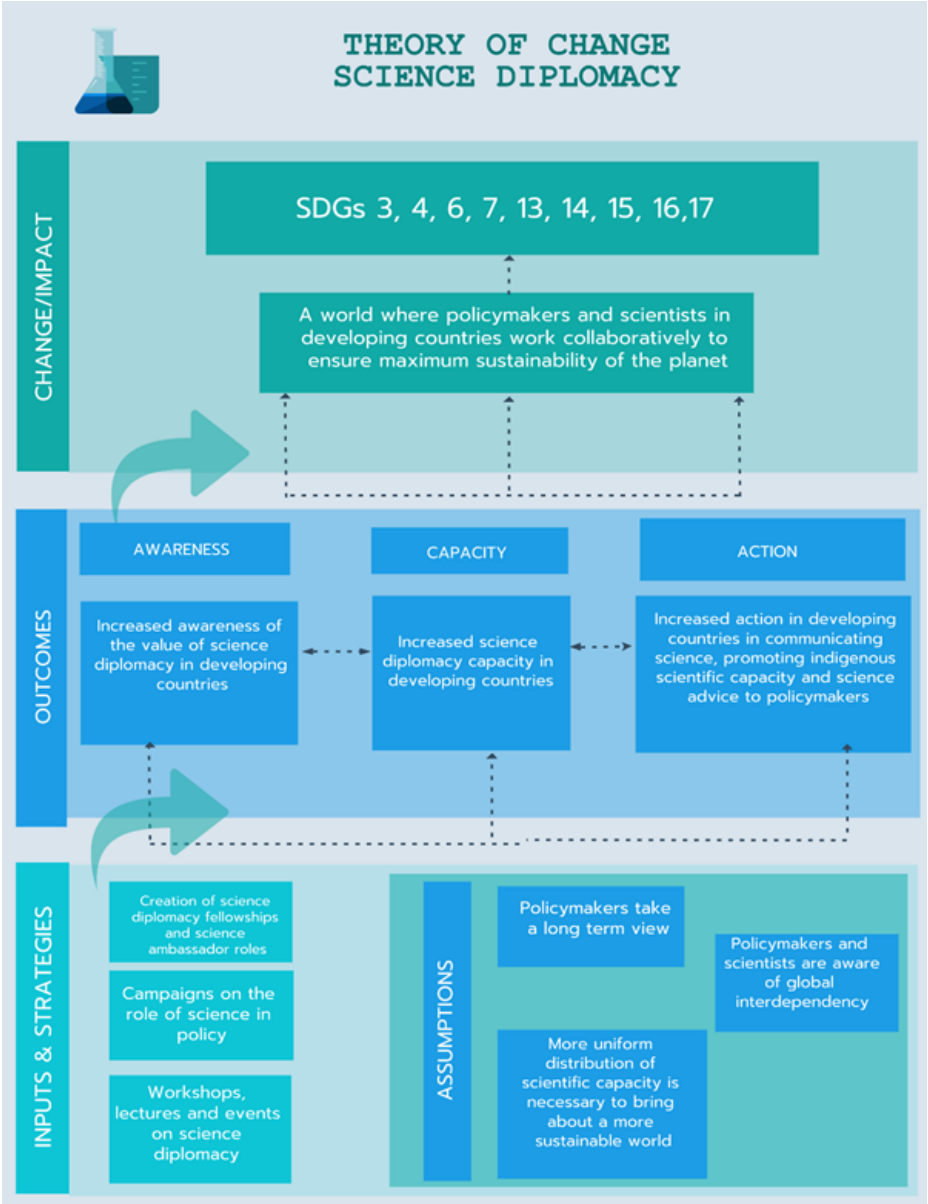
OUTCOMES

Progress towards completion of Phase I of project design

- ACTION: Communications & advocacy papers advanced
- ACTION: Strategy paper developed
- ACTION: Podcast series developed
- ACTION: Website established
- ACTION: Context & landscape described
- ACTION: Partner database developed

PRECONDITIONS & ASSUMPTIONS

- *TBC*
- TBC



Theory of Change developed by TWAS programme staff

End of Programme Evaluation of Sida's Support to The World Academy of Science (TWAS), 2017–2021

This report presents an end-of-term, forward-looking evaluation of Sida's support to The World Academy of Sciences (TWAS) for the period 2017–2021. It is intended to inform future strategy and programming in TWAS and in the Sida-TWAS partnership. The evaluation concludes that good progress has been made – e.g. young researchers in STLC countries have been strengthened through research support, soft skills, networking and exposure to the value of science beyond academia. Still, the positive benefits – although many and solid – remain at the level of the individual rather than systems, and may not have sufficient long-term benefit or in-built sustainability. The evaluators recommend that Sida continues and even increases support to TWAS, but with higher expectations and increased joint action on more strategic, sustainable financing. The evaluators also urge TWAS to provide stronger leadership towards systems change in STLC and LDC countries, to focus on greater impact through longer-term strategic partnerships, to energise networks, strengthen policies on gender and the environment, and give young and Global South scientists more voice on international forums.

SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY

Address: SE-105 25 Stockholm, Sweden. Office: Valhallavägen 199, Stockholm
Telephone: +46 (0)8-698 50 00. Telefax: +46 (0)8-20 88 64
E-mail: info@sida.se. Homepage: http://www.sida.se

Sida