Financial Flows to Promote Technology Transfers and Gender Inclusiveness for Small Island Developing States (SIDS)

Small Island Developing States (SIDS) are a distinct group of 38 United Nations (UN) Member States and 20 Non-UN Members or Associate Members of United Nations regional commissions that face unique social, economic, and environmental vulnerabilities (United Nations [UN], 2020). With a total population of 65 million, slightly less than 1% of the world’s population, they are located in the Caribbean, the Pacific, and the Atlantic, Indian Ocean, and South China Sea (AIS). SIDS face a series of unique challenges including structural constraints arising from their small economy, remote location, geographic dispersion, vulnerability to natural disasters and climate changes, narrow asset bases, rising debts, and lack of external financial resources (Asian Development Bank [ADB], 2013; Organization for Economic Co-operation and Development [OECD], 2020; UN, 2020; World Bank, 2018). On top of that, women and girls in SIDS are reported to be excluded from fully participating in access to financial funding and benefits of technology transfer (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2018).

In the past three decades, international society has been striving hard to mobilize financial resources to promote technology transfers to SIDS and facilitate its sustainable development. In 1994, the Barbados Programme of Action (BPoA) was enacted, which reaffirmed a series of specific actions that can promote SIDS to develop in a sustainable way (UN, 2020). In 2005, the Mauritius Strategy for further implementation of the BPoA was adopted to address the remaining gaps in implementation. In 2014, the SAMOA Pathway forged a new route for the sustainable development of SIDS. The three programmes have been regarded as the three main propellers for the sustainable development of SIDS, which was important in outlining the priorities for SIDS ahead of the negotiations and eventual adoption of the Sustainable Development Goals (SDGs) (UN, 2014). According to The Commonwealth Foundation (2015), the

SUMMARY
Over the past years, international society has dedicated efforts to mobilize financial resources to promote technology transfers in SIDS and facilitate its sustainable development. Accordingly, this policy brief aims to provide an overview of finance for technology transfer in SIDS by analyzing the current status for technology transfer and gender inclusiveness, discuss capacity building and institutional support, and challenges SIDS face. It recommends that SIDS refer to the Guidebook for the preparation of Science, Technology and Innovation (STI) for SDGs Roadmaps to foster stronger global partnerships and cooperation, and proposes a way forward to facilitate financial flows for technology transfer and gender inclusiveness in SIDS.

SAMOA Pathway was especially critical in signaling the international community the fundamental issues for SIDS to be included in the Post-2015 Goals. At the global level, the United Nations Framework Convention on Climate Change (UNFCCC) has confirmed the importance of enhancing the development and transfer of climate technologies to developing countries. To facilitate action in this regard, the Conference of the Parties to the Convention established the Technology Mechanism in 2010. Furthermore, the UN 2030 Agenda, which is comprised of 17 SDGs, provides an outline for the realization of sustainable development through actions such as eradicating hunger, inequality, poverty, and diseases. All these efforts have supported SIDS’ efforts to accelerate and enhance action on climate change. Moreover, these initiatives help SIDS develop and transfer climate technologies when trying to adapt to the adverse effects of the changing climate and to promote the blue economy.

Stimulating STI sectors within SIDS is essential for catalyzing a transition in SIDS’ technological development. Such technological advancements are necessary for SIDS to have the proper tools to combat the regional-prone, adverse effects of climate change in tourism and agriculture-fishery sectors as well as gender inclusiveness. However, proper finance mechanisms...
must be in place to encourage these transitions. Accordingly, this policy brief aims to:

- provide an overview of finance for technology transfer in SIDS by analyzing the current financial landscape of SIDS’ major cross-sourcing financing flows for technology transfer and gender inclusiveness,
- discuss capacity building and institutional support, and challenges SIDS face,
- review the Guidebook for the preparation of STI for SDGs Roadmaps, and
- propose policy recommendations to achieve successful technological transfer and gender inclusiveness.

A combination of quantitative and qualitative research methods was utilized in this policy brief to conduct the analysis.

2. Current Financial Landscape

To capture the current financial landscape of SIDS, an overview of the different financial flows into SIDS is conducted below.

Foreign Direct Investment (FDI)

FDI is one of the channels for cross-sourcing and technology transfer. The role of FDI in SIDS has been neglected until recently due to the small size of SIDS’ domestic markets, limited natural resources and labor supply, narrowness of export markets, and additional transport and communication costs, amongst other factors. Empirical studies suggest that selected SIDS’ growth is influenced by location as well as positively related to technology transfer and the sectoral structure of their domestic economic activity (Read, 2007). In fact, FDI is one of the largest sources of external finance for developing countries. Of the global 1.7 trillion US dollars in 2015, SIDS received 215.08 billion US dollars in FDI inflows (United Nations Conference on Trade and Development [UNCTAD] Statistics, 2022).

In 2020, under the strains of the pandemic, FDI inflows to the SIDS fell by approximately 15.7%, from 192 to 162 billion dollars (Figure 1). The decline stems from the decrease in tourism and natural resources, the postponement of projects—such as in the field of information and communications technology (ICT), the transportation sector, and the tourism sector—including delays in the production-sharing contracts and resort expansions (UNCTAD, 2021b). As such, these factors contributed to diminishing prior profits that were made in 2019. Moreover, the number of greenfield projects declined by 55%, from $2,061 million to $690 million as seen in Table 1 (UNCTAD, 2021b). This significant drop is due to the lack of attractiveness of investing in these projects, especially because of the pandemic. As a result, the projects that foster sustainable, blue and self-sufficient economies are now sharply declining.

Figure 1: SIDS FDI inflows, million US dollars

Note: The calculations are based on the 38 UN members and 20 Non-UN Members.

Table 1: Announced greenfield projects, 2019-2020

<table>
<thead>
<tr>
<th>Sector/industry</th>
<th>Value (Millions of Dollar)</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2 061</td>
<td>44</td>
</tr>
<tr>
<td>Primary</td>
<td>100</td>
<td>2</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>59</td>
<td>4</td>
</tr>
<tr>
<td>Services</td>
<td>1 903</td>
<td>36</td>
</tr>
</tbody>
</table>

Top Industries by value:

- Energy 185
- Information and communication 162
- Hospitality 1 202
- Transportation and storage 55
- Professional services 49
- Chemicals 21

Source: UNCTAD, World Investment Report, 2021b. In 2020, from the SIDS 28 countries reported by UNCTAD, only seven countries—the Bahamas, Barbados, Comoros, Grenada, the Marshall Islands, Palau, Samoa, and São Tomé and Principe—recorded financial flow increase. FDI flows to the top five recipients (Figure 2) accounted for four fifths of all FDI flows to this group (UNCTAD, 2021a). The augmentation is reflected in the different levels of development and factors endowment, which attracted the bulk of the FDI in 2020 (UNCTAD, 2021b). Such factors include green projects that promote diversification.
efforts regarding renewable energy, industry, infrastructure development, and business services (Table 2).

Figure 2: SIDS top 5 recipients of FDI flows, 2019 and 2020

Source: UNCTAD, 2021a.
Note: These calculations are based on the 28 SIDS countries.

Table 2: SIDS 10 largest greenfield projects announced in 2020

<table>
<thead>
<tr>
<th>Host economy</th>
<th>Industry</th>
<th>Parent company</th>
<th>Home country</th>
<th>Estimated capital exp (million of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seychelles</td>
<td>Energy</td>
<td>Total</td>
<td>France</td>
<td>106</td>
</tr>
<tr>
<td>Seychelles</td>
<td>Energy</td>
<td>Clarit</td>
<td>France</td>
<td>105</td>
</tr>
<tr>
<td>Maldives</td>
<td>Information and communication</td>
<td>Donostia (Calar Telekom)</td>
<td>Qatar</td>
<td>102</td>
</tr>
<tr>
<td>Grenada</td>
<td>Hospitality</td>
<td>Range Holdings</td>
<td>United Arab Emirates</td>
<td>84</td>
</tr>
<tr>
<td>Mauritius</td>
<td>Transport and storage</td>
<td>Wegv Lloyd</td>
<td>Germany</td>
<td>44</td>
</tr>
<tr>
<td>Seychelles</td>
<td>Professional services</td>
<td>Agility</td>
<td>Barbados</td>
<td>22</td>
</tr>
<tr>
<td>Mauritius</td>
<td>Professional services</td>
<td>Bishop Design</td>
<td>United Arab Emirates</td>
<td>22</td>
</tr>
<tr>
<td>Jamaica</td>
<td>Chemozoe</td>
<td>Blanca Group</td>
<td>United States</td>
<td>21</td>
</tr>
<tr>
<td>Vanuatu and Tokelau</td>
<td>Transport and storage</td>
<td>Blue Water Shipping</td>
<td>Denmark</td>
<td>11</td>
</tr>
<tr>
<td>Jamaica</td>
<td>Other manufacturing</td>
<td>Congress</td>
<td>Ireland</td>
<td>10</td>
</tr>
</tbody>
</table>


While greater mobilization of private sources of finance such as FDI can potentially help confront the sustainable development challenges of SIDS, it is important to note that FDI is very volatile, procyclical, and causes financial leakages through profit repatriation (UNDP & UN-OHRLLS, 2015). Governments must therefore work toward a more robust and resilient framework for FDI. Ultimately, ensuring that FDI serves as a reliant financial mechanism, which stimulates SIDS economic growth and respective technology transfer. Such efforts are currently underway in some of the SIDS as they upgrade their “FDI regulatory environment, streamline investment processes and limit the difference between domestic and foreign investors to develop new capacities in green growth and green technology” (UNCTAD, 2021b). Moreover, the public-private partnership (PPP) framework is revised to facilitate more project finance for infrastructure development (UNCTAD, 2021b). With the above efforts to attract FDI and promote respective benefits, SIDS still face short- and medium-term challenges in recovery (UNCTAD, 2021b). Further work is needed correspondingly.

As FDI is slow to overcome shocks, it is important to build resilience with FDI in times of crisis. As seen in the tables and figures above, despite the pandemic, FDI increased in some countries as they have built an internal environment for technology adaptation—closing the gap between foreign and domestic investors for green technology. The pandemic did not completely disrupt the ongoing work in the green energy sector and green projects. By creating national resilience and a robust absorption capacity, a country will attract FDI even in times of crisis. Moreover, FDI is concentrated in some SIDS more than others. So, efforts are needed to streamline financial flows for technology transfer to those SIDS on the least receiving side of the spectrum. Financial flows for technological transfer internally and through FDI in SIDS would be enabled by addressing these shortcomings.

Climate Finance

SIDS are at the forefront of loss arising from natural disaster—about 1% to 9% of their GDP each year—which hinders their economic growth and development (OECD, 2020). While market-based financing mechanisms have become more accessible globally, some SIDS still lack access. Thus, SIDS tend to rely on concessional financing from the international community as a key finance source for climate and disaster resilient development (OECD, 2020). However, this is a contentious issue. The recent graduates of Least Developed Countries (LDC) category are mostly SIDS and once they graduate, they lose the access to concessional financing, and that’s why their commercial debts have kept increasing. SIDS have been arguing for a long time that the environmental vulnerability needs to be considered despite being classified middle class, to access concessional financing. Hence, the vulnerability index or vulnerability-resilience country-profiling has been advocated for a long time for that purpose.

Climate finance stems from various climate finance institutions including: The Adaptation Fund (AF), the Climate Investment Funds (CIF), and the Green Climate Fund (GCF), among others (Figure 3). These funds are specifically intended for climate change intervention by providing support to SIDS in terms of capacity building for renewable energy sources and transitioning SIDS to innovative climate adaptation technology.
While it is evident that climate finance support is provided to SIDS, “climate action in SIDS remain poorly funded given the magnitude of the challenge, and approved finance fulfills only a small part of actual needs” (UN-OHRLSS, 2020). Apart from complex climate finance architecture that requires a long application process and tends to be overwhelming for small offices, the duration between project proposals and implementation does not reflect the urgency of the climate crisis nor the 2030 targets (UN-OHRLLS, 2020). Additionally, there is a lack of operational mechanisms that compensate financing loss and damage despite implemented mitigation and adaption efforts. While climate funds aid in providing the necessary financial tools to promote technology transfer in SIDS, gaps remain in meeting the SDGs commitments and moreover, financing does not account for the shortfall of adaption and mitigation technology that is in place. Therefore, further capacity building in terms of absorption capacity for renewable energy sectors are needed to increase the currently 10% of total installed capacity in the power sector for SIDS to 100% (UN-OHRLLS, 2020). Moreover, operational mechanisms must be introduced to provide compensation and expert support groups for other climate threats including habitat loss, migration, and lifestyle changes.

**Official Development Assistance (ODA)**

ODA is defined by the OECD (2020) Development Assistance Committee (DAC) as government aid that promotes and specifically targets the economic development and welfare of developing countries. According to the UN-OHRLSS (2020), “ODA includes grants, concessionary loans (where the grant is at least 25% of the total) and technical assistance”. ODA has been regarded as crucially important for the development of SIDS. For 10 Pacific Island countries, ODA accounts for the highest proportion of national income in the world (Dornan & Pryke, 2017). The low transaction cost associated with ODA is very attractive to SIDS, especially because they are not as volatile as other financial mechanism and hence, are more reliable (Dornan & Pryke, 2017). Furthermore, ODA funding directly targets the development of STI capacities. ODA resources contribute to research and development (R&D) for climate solutions, yet further distinction must be made if the government funds are intended for R&D spending aimed at domestic STI capacity or for financing specific research activities conducted by the donor country (OECD, 2019). Efforts should be underway to differentiate between these two initiatives since localized research efforts at institutions must be increased in SIDS. In turn, this promotes R&D from a national proposition, enhancing STI capacities within SIDS. Essentially, it is crucial that SIDS continue to receive consistent ODA to mobilize financial means and ODA-eligible for research to promote STI growth and technology transfer on a national level (Kosolapova, 2020).

Figure 4 depicts the total net ODA disbursements by DAC donors to SIDS from 2011-2019. However, recently the dynamics of ODA flows into SIDS has tightened. In the last few years, the rising refugee problems forced European countries—some of the main donors of ODA—to spend funds on refugee-related efforts. Additionally, the outbreak of COVID-19 has led to governments of developed countries prioritizing pandemic mitigation efforts instead. As a result, fewer funds are available for ODA dissemination (Cornish & Chadwick, 2021).
While some may argue that SIDS receive a small share of ODA, according to UNDP & UN-OHCHR (2015), “when aid receipt is measured as a proportion of GNI on a per capita basis, it comes evident that they are large recipients— as a proportion of GNI, ODA is twice as important in SIDS as in most other developing countries”. Therefore, some SIDS heavily rely on ODA funds.

As COVID-19 is disproportionately affecting the developing realm, the correlation between ODA dependency and COVID-19 exposure indicators is brought to light. “Regardless of SIDS income per capita, ODA-dependent SIDS are better protected against the economic consequences of the COVID-19 crisis” (OECD, 2020). Simply put, ODA promotes resilience in times of unprecedented shocks, which is of greatly important to vulnerable populations like SIDS. To prevent funds from being redirected from STI investments to shock recovery, ODA needs to adjust its usual business to build resilience in times of crisis and further promote its flows for STI advancements in SIDS.

### 3. Challenges and Support from the Gender Perspective

An important dimension of assessing a SIDS’ current situation involves progress towards gender equality as per SDG 5, which has implications for the different financial flows into SIDS in terms of investment, markets, and funds (UN IATT, 2020). At the global level, two thirds of the world’s 750 million illiterate adults are women; women are also underrepresented in STEM education and in R&D personnel, technical publications, patenting, innovation, and management (UNESCO, 2018). In SIDS, for example, women make up the bulk of mainly low-skilled workers in the tourism industry (Zarrilli & Aydiner-Avsar, 2020). The impact of the COVID-19 pandemic on women working in the tourism sector of SIDS is disproportionate, but so is the emerging policy response and financial mechanism, which lacks an explicit gender component (Zarrilli & Aydiner-Avsar, 2020).

Thus, while SIDS have prodigious potential for innovation and adaption to global innovations, they face many barriers, which hinder technology transfer and sustainable development within regions. In general, SIDS face challenges including: (a) lack of STI infrastructure, (b) lack of STI absorption capacity, (c) lack of skill/knowledge and R&D in STI, (d) poor STI resource allocation, (e) small market size and thus, a low commercial incentive. These issues constitute a need for reform and transition in SIDS through capacity-building efforts and institutional support to bridge the above-stated gaps and establish a robust framework that supports STI absorption within SIDS sectors.

A multitude of initiatives are underway to aid SIDS in overcoming the above-mentioned barriers of technology transfer. This support comes in a variety of forms including: (a) institutional mechanisms, (b) partnerships, and (c) technical assistance and expert guidance. These efforts tend to interconnect as one initiative and will cover more than one of the outlined frameworks. SIDS

Dock is a SIDS-SIDS institutional mechanism established to facilitate the development of a sustainable energy economy within SIDS. The “docking stations” increase SIDS access to international financing and technical transfer, as well as a link to the multi-billion dollar European and US carbon markets. UNIDO has committed a variety of agendas to its SIDS strategy. Climate and Technology Centre and Network (CTCN) provides technology solutions, capacity building, and advice on policy, legal, and regulatory frameworks tailored to the needs of individual countries (UNIDO, 2021). Moreover, the Private Financing Advisory Network (PFAN) is a global network of climate and clean energy financing experts that bridges the gap between entrepreneurs developing climate and clean energy solutions and private sector investors (UNIDO, 2021). Additionally, partnerships are emphasized through South-South Cooperation and UNIDO GN-SEC, which provide innovative ways to overcome shared SIDS challenges while accelerating the energy and climate transformation through economies of scales and spill-over effects between countries (UNIDO, 2021).

With the goal of helping small and vulnerable states to secure funding for tackling climate change, the Commonwealth Climate Finance Access Hub (CCFAH) is
worthwhile mentioning (The Commonwealth, 2022). The Hub has helped countries to access approximately $45 million of climate finance as of December 2021, covering 34 approved projects in 7 countries and 57 pipeline projects in 11 countries.

More recently, UN-OHRLLS has announced the establishment of SIDS-Global Business Network (GBN) consisting of SIDS-GBN Forum and website, which will be launched during the 2022 Forum in Palau (UN-OHRLLS, 2022). Technical cooperation including deployment of technology, advisory services and training has been strongly promoted. Good practices are referred to the past examples of partnerships from previous Forums such as International Finance Corporation (IFC)’s commitment to promote upstream business reforms, PPP guidelines and technical assistance to promote commercial investment in SIDS, and the Enel Group working with interested SIDS in renewable energy and offering cutting-edge wave energy technology and hybrid renewable-storage systems toward providing sustainable energy solutions to isolated communities.

Although some achievements have been made, from the gender perspective, it is reported that significant obstacles remain for women and girls in SIDS, including inadequate digital infrastructure, insufficient training opportunities, a growing digital divide, and a lack of data and policy knowledge (UNIDO, 2021). According to the UNESCO STEM and Gender Advancement (SAGA) Team (2018), there are no well-established plans or strategies for the promotion of gender equality in science in Haiti. A Cariscience/UNESCO STI Policy workshop in 2017 revealed both the absence of baseline data and any national policy directive addressing gender equality in Jamaica (UNESCO SAGA Team, 2018). Hence, efforts must be geared towards closing the gender divide and supporting women in STEM fields in order to effectively adapt STI transfers in SIDS.

Although capacity building and institutional support have already been in place, barriers still exist. For example, climate mitigation funds do not account for absorption capacity. FDI is volatile and vulnerable during times of crisis, while ODA is unevenly disbursed among SIDS and thus, not evenly accessible. Stakeholders therefore need to find solutions for overcoming the limitations in place. Most importantly, there is the need for a holistic approach for international collaboration. In other words, stakeholders—including the private sector, academia, and government—should join efforts to achieve robust mechanisms that facilitate SIDS ability to equally absorb and receive domestic and global support, even in times of crisis. Ultimately, global, collective action will ensure that financial flows remain resilient and efficient and stimulate and advance sustainable technology transfers in SIDS.

The current Guidebook for the preparation of Science, Technology and Innovation (STI) for SDGs Roadmaps serves as a resource that proposes the “use of roadmaps as a policy tool to harness STI as a means to achieve the SDGs”. Particularly, Chapter 3 of the Guidebook underlines the need for robust global partnerships to strengthen the development and implementation of STI for SDG Roadmaps, which is directly transferable in terms of the need for cooperation by international actors to facilitate financial flows for technology transfer in SIDS.

To ensure solidified cooperation between actors, it is essential that systematic and synchronized actions are undertaken by all stakeholders (Figure 5). Essentially, development, STI, and SDGs are interconnected and thus, a holistic approach is needed to fortify their interdependent relationships for promoting stronger STI financing and infrastructure support.

Figure 5: International STI for SDGs cooperation: domains and actors

Source: UN IATT, 2020
To navigate the above process, a three-pillar structure outlines the needed transformations to bridge the gaps that currently hinder technology transfer in SIDS on a collaborative foundation (Figure 6). Pillar one aims to strengthen national STI capacities in terms of knowledge and technology absorption (UN IATT, 2020). To build on pillar one, pillar two emphasizes the collaboration of “boosting international flows of relevant knowledge, technology, and innovation across countries, and on supporting cross-border STI collaborations adapting international framework conditions to foster existing STI for the SDGs, as well as promoting stronger non-market flows such as scientific, academic and professional cooperation” (UN IATT, 2020). Lastly, the third pillar focuses on engaging in international collective STI actions with the ambition of tackling global challenges to preserve the global commons as well as enhancing new technologies to spark ameliorated solutions for SDG achievement (UN IATT, 2020).

The pillars as well as the respective approaches that are taken collectively are interdependent. Accordingly, it’s necessary that the best-fit for each mechanism is chosen to maximize impacts and results.

The Guidebook presents instruments to absorb, disseminate, and use relevant technology and innovations, including:

- Public awareness campaigns and outreach activities to support the use of technologies/innovations for the SDGs.
- Creation and support of online innovation platforms that facilitate access to and transfer of technologies such as the UN online technology platform and WIPOs Green Technology Platform.
- Business advisory services to build up management capability and help increase productivity, attainment of safety, health and environmental standards and gender equality.

It is recommended that SIDS refer to the Guidebook to outline their own regional-based roadmap to highlight their specific-national technical needs and barriers regarding financial flows for STI developments and gender inclusiveness. The following components can be considered as part of the international solution to facilitate financial flows for technology transfer in SIDS:

- increase partnerships,
- create a channel of communication for exchange and encourage knowledge-sharing platforms,
- form expert support and technical groups,
- stimulate operational mechanisms,
- hold capacity-building workshops,
- streamline financial support, and
- increase R&D investment in SIDS.

In particular, the achievement of technology transfer in SIDS cannot be realized without the participation of women (Goransson, 2019). Specifically, in the technology and innovation field, women remain under-represented (ITU, UNESCO, & WIPO, 2020). When developing national STI roadmaps, SIDS’ governments should also incorporate programs and initiatives that are targeted toward women.

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