Supporting Developing Countries
IN HARNESSING TECHNOLOGY FOR DEVELOPMENT

FINANCING FOR DEVELOPMENT IN THE ERA OF COVID-19 AND BEYOND INITIATIVE

CLUSTER III ON FINANCE AND TECHNOLOGY

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Note

To advance a coordinated policy response to the f i nancing challenges associated with COVID-19, the United Nations Secretary-General and the Prime Ministers of Canada and Jamaica convened the High-Level Event on Financing for Development in the Era of COVID-19 and Beyond on 28 May 2020.

In the follow-up to the event, six discussion groups composed of Member States, United Nations agencies and various international institutions proposed a menu of policy options to address financing challenges to achieve the 2030 Agenda for Sustainable Development. These policy options were considered by Finance Ministers and subsequently the Heads of State and Government, during a series of high-level meetings in 2020 and 2021.

Following these discussions, six clusters have been set up to advance these policy options: (i) Sustainability and climate action, led by UNDP; (ii) Socio-economic response: social protection, gender, youth, health, education and human rights, led by ILO; (iii) Finance and technology, led by UNCTAD; (iv) Liquidity and debt vulnerability, led by UNDESA; (v) Illicit financial flows, led by the Regional Economic Commissions; and (vi) Addressing special country needs, led by UNDESA.

This Cluster III paper highlights the forms of support necessary and lays out action plans to enable the pilot countries to develop and harness key technologies.

The term "country" as used in this study also refers, as appropriate, to territories or areas. In addition, the designations of country groups are intended solely for statistical or analytical convenience and do not necessarily express a judgment about the stage of development reached.

Preface

Cluster III on Finance and Technology is a follow-up to the High-Level Event in May 2020 on the Initiative on Financing for the Development in the Era of COVID-19 and Beyond (FFDI). Since then, Cluster III members have gathered on several occasions and agreed to find ways to (i) accelerate the closing of multifaceted digital divides and (ii) mobilize investment in sustainable infra structure.

United Nations Deputy Secretary-General Amina J. Mohammed provided a roadmap for the next steps of the initiative in August 2021. Work will be undertaken to support the pilot countries in ending the pandemic, recovering swiftly, and investing in a more sustainable, resilient, and inclusive future. In so doing, the Cluster will focus strategically its resources and find opportunities for synergistic collaboration in the pilot countries, generating tangible results that will propel the momentum of the initiative forward.

To facilitate that objective, this short paper has been prepared to structure policy actions and lay out concrete steps to advance the FFD Initiative. It has prepared by UNCTAD with inputs from other UN Agencies, Regional Commissions, and member States of Cluster III partners.

UNCTAD remains committed to working with other members of Cluster III to take immediate action to support countries and other actors in improving the alignment of Finance, Investment, and Technology to recover better from COVID-19 and accelerate the implementation of the SDGs.

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I.   Introduction

To advance a coordinated policy response to the financing challenges associated with COVID-19, the United Nations Secretary-General and the Prime Ministers of Canada and Jamaica convened the High-Level Event on Financing for Development in the Era of COVID-19 and Beyond on 28th May 2020.

In the follow-up to the event, six discussion groups composed of Member States, United Nations agencies and various international institutions proposed a menu of policy options to address financing challenges. These policy options were considered by Finance Ministers in a meeting convened by the Deputy Secretary-General and the Finance Ministers of Canada and Jamaica on September 8, 2020. Several priority policies were further discussed at a special meeting of Heads of State and Government on the margins of the 75th United Nations General Assembly on 29th September 2020.

Following these discussions, six clusters have been set up to advance these policy options: (i) Sustainability and climate action, led by UNDP; Socio-economic response: social protection, gender, youth, health, education and human rights, led by ILO; (iii) Finance and technology, led by UNCTAD; (iv) Liquidity and debt vulnerability, led by UNDESA; (v) Illicit financial flows, led by the Regional Economic Commissions; and (vi) addressing special country needs, led by UNDESA.

Furthermore, in August 2021, the Deputy Secretary-General of the United Nations, Ms. Amina J. Mohammed, shared her note on the next steps of the initiative. The emphasis is to be on national-level implementation, with the aim of generating tangible results that will support the 27 pilot countries in ending the pandemic, recovering swiftly, and investing in a more sustainable, resilient, and inclusive future.

Cluster III is coordinated by UNCTAD, with participation from partner agencies such as ITU, UNEP, UNIDO, ECE, ESCAP, and ECA. It has two tracks: finance and technology. The goals of the finance track include increasing investment in sustainable infrastructure, while the technology track aims at accelerating the closing of the multifaceted digital divides.

This paper, with a focus on the technology track of Cluster III, highlights the key support areas that result from the mapping exercise and lists action plans to support the pilot countries in harnessing key technologies development. To speed up the implementation process of FFDI in the pilot countries, Cluster III members have conducted a mapping exercise of the analytical work and capacity-building activities on technology from the respective members, the results of which will be presented in this paper. The time is ripe for coordinated actions to support the pilot countries in providing enabling ecosystems for STI that can support the recovery from the Covid-19 pandemic.

The structure of this paper is as follows: Chapter II discusses policy options to create an enabling environment to advance the technology tracks of the Financing for Development Initiative. The chapter also suggests collaborative actions that may be taken by Cluster III members and the international community. Chapter III discuss detailed programmes and projects from Cluster III members in the pilot countries. Finally, Chapter IV will provide conclusion while a detailed list of action plans from Cluster III members is shown in the Annex.

II. Building Enabling Policy Environments

The policy issues involved in the area of work of Cluster III on technology are complex. Closing digital divides requires multidimensional strategies that consider technological, economic, educational, social and persuasive (awareness) perspectives. [1]

- Technological, with a focus on physical access to ensure availability.

- Economic, to support the digital sector and markets, adapting and enforcing competition rules, supporting business and social innovation.

- Educational, focusing on digital skills to improve the readiness of people to use digital solutions.

- Social, to promote the inclusion and participation of all. Here the focus is on the affordability, readiness and relevance of digital applications.

- Awareness, to enhance the understanding of the interrelated issues raised by digitalization, for example, with regard to privacy, security, discrimination etc.

Developing countries need support to put in place a policy environment that enables the alignment of these different perspectives in dealing with the digital divide. The activities of Cluster III should contribute to the development of such a policy environment.

A. Building blocks for enabling environments

The actions of Cluster III in technology will achieve their maximum impact only in the context of a supportive policy environment. Such a policy environment should facilitate the a) acceleration of the process to close the multifaceted digital divides, and b) increasing investment in sustainable infrastructure. At the same time, several programmes of Cluster III partners could in themselves contribute to the establishment of such an environment.

Building an enabling environment to achieve those objectives will be part of broader efforts to support the emergence and development of innovation ecosystems in developing countries.[2] Five building blocks are generally considered as critical for the enabling environment of innovation systems (Figure 1), and Cluster III should help improve the coordination of its members' activities in all of them:

- The regulatory and policy framework.

- The institutional setting and governance.

- The entrepreneurial ecosystem and access to finance.

- Human capital; and

- Technical and R&D infrastructure.

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[1] UNCTAD (2021). *Technology and innovation report*. Geneva.

[2] UNCTAD (2018). *Technology and innovation report*. Geneva.

Figure 1.

The systemic foundation of innovation and technological upgrading.
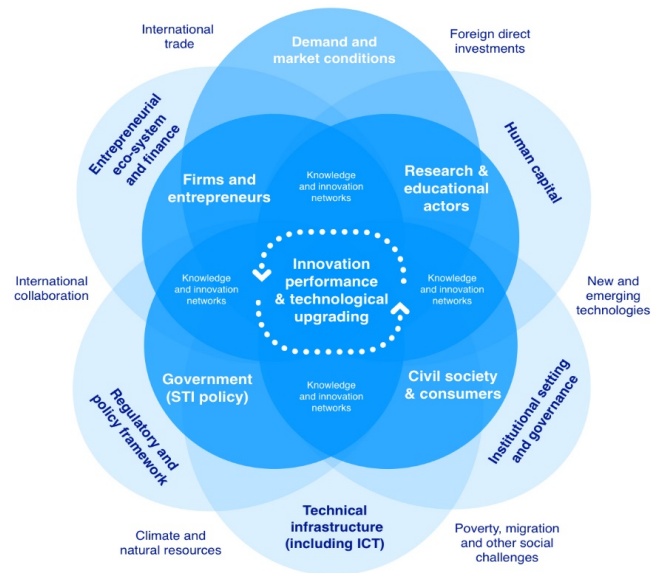
Source: UNCTAD, 2018.

The regulatory and policy framework provides incentives for established and emerging firms to invest in learning, knowledge, and innovation. Policies should provide a stable and predictable environment to facilitate long-term planning by firms and other innovation actors, including organizations that finance technology and innovation.

The regulatory and policy frameworks should be reviewed and strengthened, where appropriate, to address issues of data governance (including to avoid concentration of market power), inclusive digital access, content accountability, discrimination, and human rights. Countries also need to develop national technology and innovation strategies (e.g., blockchain, ecommerce, artificial intelligence, etc.) to give policy directions for further development in the area. Furthermore, international coordination will be needed to ensure coherent global standards.

The institutional setting and governance encompass legal rules, standards and norms, and the organizations and governance mechanisms used to create and enforce them. Institutions should incentivize actors to invest in productive rather than rent-seeking activities. Of particular importance are the organizations designed to support firms in learning, knowledge creation, and the accumulation of technological capabilities, and specialized bodies for financing technology and innovation.

For example, regulators and supervisors can build on financial technology to support financial inclusion while addressing growing risks from cyber incidents and digital fraud – by strengthening consumer protection and holding financial service providers accountable for safeguarding data.

The entrepreneurial ecosystem and access to finance are critical to business incubation and encouraging the growth of innovative companies. An entrepreneurial ecosystem oriented towards supporting innovation should provide flexible access to finance, particularly for young entrepreneurs and innovative

companies. Ensuring access to financial support for promising innovation projects requires not only the availability of funds, but also organizational capabilities and policy frameworks.

Human capital allows firms to engage in technology adoption and innovation processes, and to harness the wider benefits of STI. Recent technologies have increased the importance of skills such as problem-solving, teamwork, creativity, and ICT skills. To close digital divides, policymakers need to ensure universal and affordable internet access, digital skills training, and targeted policies for specific groups, including women and girls.[3]

Bridging digital divides also requires basic digital literacy and skills. Governments that want to improve digital capacity need to provide life-long digital training programmes in an inclusive manner in collaboration with the business sector and academia. This offers opportunities for public-private partnerships through which governments raise levels of digital skills.

Technical and R&D infrastructure is indispensable to enable STI activity by firms and other actors in the innovation system and for them to interact nationally and internationally. Digital infrastructure is the most critical element of such technical and R&D infrastructure, given the central role of digitalization in the advancement of other key technologies such as biotechnology, nanotechnology, and advanced manufacturing.

Cluster III should consider how to support governments in developing countries in creating the conditions for affordable yet high-quality digital infrastructure to support the competitiveness of the private sector. This requires the mobilization of investment in information and communications technology infrastructure and the creation of a regulatory environment that enables competition in the telecommunications sector.

B.   Financing technology and innovation

An important objective of technology and innovation policy is to promote the development of financing instruments appropriate to each stage of the innovation process, taking into account the financing gaps at each stage and the degree of financial development of the economy. Particular attention is required to support the early stage of innovation, notably in terms of seed financing for the initial R&D needed to establish the technical feasibility and market potential of an innovation before the start-up phase.

Traditional financial systems have proven poorly suited to meeting the needs of rapid pace of innovation and technology. In many developing countries, financial systems are characterized by excess liquidity in banking markets, which is not channeled into investment in technology and innovation due to a combination of risk-aversion, asymmetric information, and the fundamental problem of pricing under uncertainty.

Moreover, established lending practices tend to favor large firms in mature industries rather than MSMEs seeking to explore opportunities in the digital economy. Commercial banks need to be encouraged to develop tailored lending practices and products better adapted to the needs of digital entrepreneurs. Special efforts may also be needed to train MSMEs in developing bankable business plans that meet the requirements of commercial banks. Women-led business need to proactively take advantage of business opportunities in the digital economy. Governments should persuade business associations and women-led associations that work closely with small businesses to undertake capacity-building initiatives[4].

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[3] United Nations (2022). *Financing for Development Report 2022*. Forthcoming.

[4] UNCTAD (2021). *Digital Economy Report*. Geneva.

Public sector support is often needed to close the financing gaps that affect STI in most countries. Such support can be direct and indirect, through mechanisms such as fiscal incentives to encourage investment where private investors are unwilling to bear the risks involved. Additionally, the bulk of the public investment, supplemented by Official Development Assistance (ODA) and concessional loans, needs to be devoted to sustainable infrastructure development that harnesses technology and innovation.

Private sectors and entrepreneurs play a key role in mobilizing investment in frontier technologies and providing sustainable infrastructure. Government and development partners need to engage them in channeling those investments to build an inclusive ecosystem for innovation and technology development to reduce digital divides and other multifaceted inequalities.

Foreign Direct Investment (FDI) could also provide additional financing and knowledge of transfer. However, incentives towards FDI should be designed cautiously and incorporate provisions on the role of FDI in technology transfer and knowledge linkages. FDI can be an important channel of technology transfer, but the link between FDI-related technology transfer and technological learning and upgrading in the domestic economy is not as automatic as is often assumed.

Development banks are becoming important actors that represent a potentially valuable mechanism for financing technology and innovation, providing loans or guarantees for new firms and innovative activities. They pursue developmental rather than purely commercial objectives and can take long-term investment positions and provide subsidized financing for developmental projects.

Innovative financing instruments, such as innovation and technology funds, new type of bonds (e.g., Green or SDG bonds), crowdfunding, venture capital, business angel finance, and impact investment can help to channel funding toward closing digital divides and financing sustainable infrastructure. Developed countries and development agencies need to provide technical assistance for developing countries to help them build human capacity, strengthen regulatory support, and deepening the financial markets to set up the necessary condition of these innovative financing instruments.

Additionally, technology itself could enhance existing financing for development mechanisms, especially for low-income households and smaller firms. For example, e-commerce platforms help small businesses to thrive, even during the peak of pandemic with limited physical mobilities. Mobile applications that provide peer-to-peer lending services could help small and medium-sized business owners to meet their financing needs, by bridging supply and demand to provide more inclusive financing support.

C.   International collaborative actions

Cluster III partners should develop synergies among their respective country-level activities, particularly in terms of capacity building. In the selected pilot countries, joint activities and events should be organized under the umbrella of Cluster III and FFD Initiative on every occasion when this is possible. This will help leverage each entity's expertise and know-how in specific areas, maximize efficiency and impact, and enhance even further the cohesiveness of the UN country teams.

Building on that, Cluster III members can explore possibilities to target more specific outcomes and mobilize resources to support the FFDI in technology for the pilot countries. This could be achieved through the development of a joint project among interested Cluster III partners, either funded by donor countries or using other UN instruments such as a future Development Account project.

Furthermore, beyond the Cluster III members' work at the country level, Cluster III activities could

provide practical models to encourage the adoption of more collaborative approaches to technology for development.

Encourage coordination through multilateral platforms

Developing countries need to be more present in international debates about the direction of technological change (driven in particular by digitalization) and how it affects the achievement of the SDGs. Developing country concerns need to be reflected in normative frameworks and regulatory regimes – balancing individual and collective rights, while encouraging private sector innovation. The work of Cluster III on technology could contribute to raising global visibility of these needs and concerns by utilizing the platform provided by the United Nations Commission on Science and Technology for Development (CSTD), which is the focal point in the UN system dealing with STI for development.

The CSTD could also provide a useful platform to project and support Cluster III work. This is especially for projects which enable international cooperation between developed and developing countries in technology transfer and capacity-building, as well as those which support the participation of innovation actors from developing Member States in international STI networks.

Promote South–South, North–South and triangular cooperation

The work of Cluster III should facilitate the exchange of knowledge, research, experiences, success stories and best practices with leading policymakers, innovators, technology leaders, and regulators in North-South, South-South and Triangular cooperation settings. Activities under Cluster III could also target markets or market segments with greater demand for joint technological development. Such collaborative programmes could help facilitate technological exchanges particularly with countries leading in such technologies. Activities should focus on the following:

- Capacity-building. Scaling-up capacity-building activities; contributing to capacity-building activities at national and regional levels, including creating online and hybrid training programmes.

- Supporting technological upgrading. Upgrading of digital and non-digital industries to increase high-technology production and exports.

- Improving foresight and technological assessment. Cooperation on strategic 'foresight and technological assessment' initiatives to better understand the socio-economic and environmental implications of new and innovative technologies.

III.   Actions to support pilot countries

A.   Technology-related Activities of Cluster III in the pilot countries

This section presents the results of a mapping exercise of the support provided by Cluster III partners at the country level.

The geographical distribution of projects and programs from Cluster III partners can be seen in Figure 2. A darker blue colour shows the number of activities being undertaken in each pilot country. Pilot countries in Africa such as Kenya, Zambia, and Nigeria are hosting many activities, ranging from technical assistance (e.g., water technologies, the CropWatch project), country assessment (e.g., e-commerce strategy, climate technology assessment), and capacity building programmes (e.g., security assurance for digital finance, technology transfer for development).

Figure 2.

Geographical distribution of activities in the pilot countries.
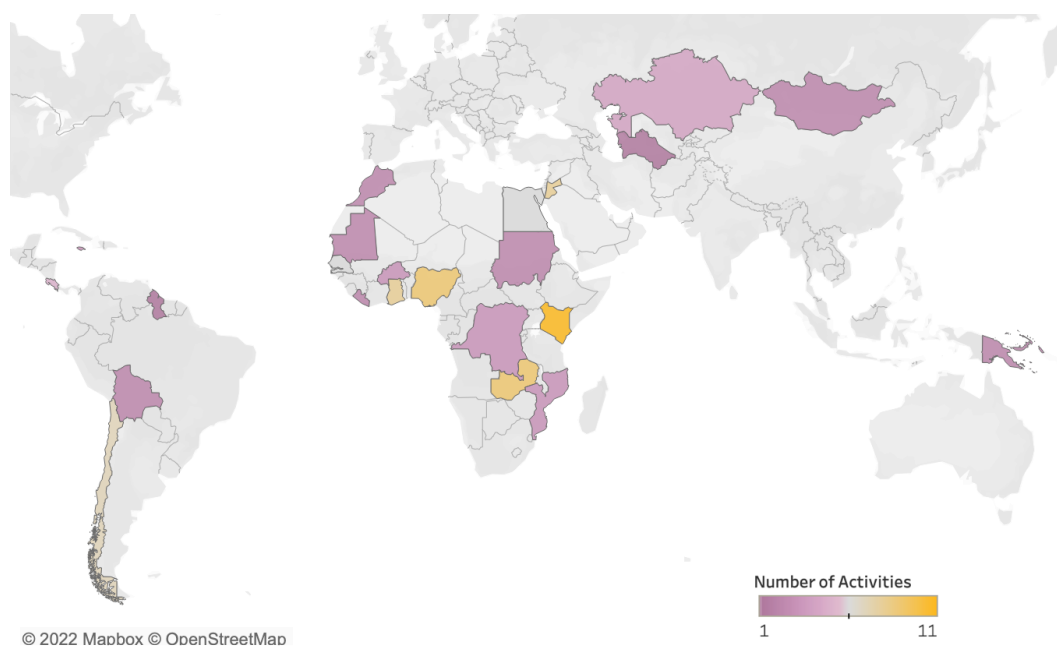
Source: UNCTAD.

A more granular picture of the distribution of activities among the pilot countries is presented in Figure 3. From the figure, Cluster III partners have eight or more projects or programs in Kenya, Zambia, Nigeria, Jordan, and Ghana. Meanwhile, Cluster III members are less active in Turkmenistan (Environmental Sound Management from UNIDO) and Guyana (Sustainable Agtech from UNEP). Please note, however, that the actual number of activities related to technology components that are provided by the UN system in these countries could be higher, since not all UN agencies active in these countries contributed data to this exercise.

Figure 3.

Distribution of activities in pilot countries in terms of number of activities.
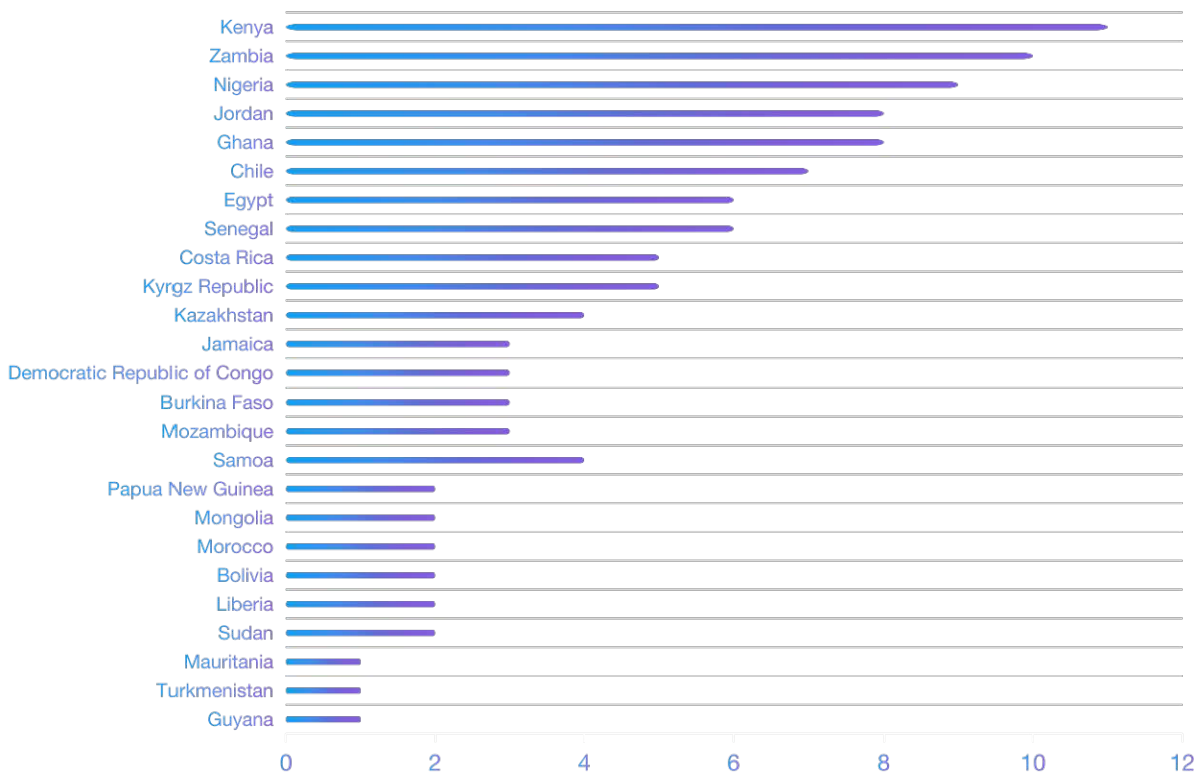
Source: UNCTAD.

More than 60% of Cluster III activities benefit pilot countries in the African region, while less than 10% of total activities of the cluster are registered for each East-Central Europe and Asia-Pacific region, as can be seen in Figure 4.

Moreover, in Figure 5, the mapping of the activities of participating agencies showed that more than 60 percent of the Cluster's work aims to increase investment in sustainable infrastructure, while the rest seeks to accelerate the closing of multifaceted digital divides.

Figure 4.

Activities based on region.

Figure 5.

Activities based on policy options.
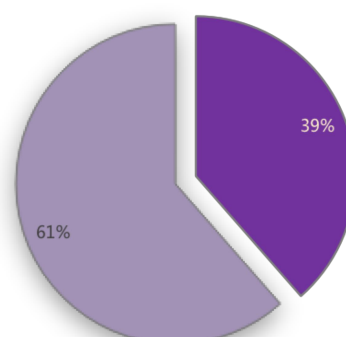
Source: UNCTAD.

This mapping of activities illustrates nicely the distribution of projects and programmes of Cluster III members. The information would be beneficial for UN country teams and the policymakers in the pilot countries to move forward the Financing for Development effort related to technology and innovation. It also shows that there is room for collaboration and concerted efforts to bring about tangible outcomes in supporting beneficiary countries in a post-pandemic world.
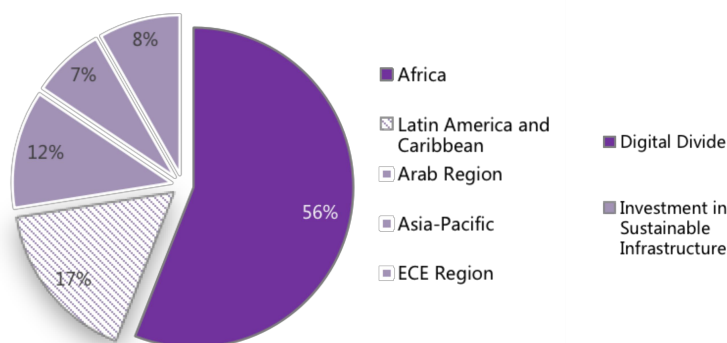
Cluster III partners could find synergies in the delivery of their respective country-level activities, particularly in terms of capacity building. These could be achieved by focusing activities on selected pilot countries where joint activities could be organized under the umbrella of Cluster III and the FfD Initiative. This will minimize overlaps, enhance efficiency and improve coordination with UN country teams, leveraging each entity's expertise and know-how in specific areas.

The next section will discuss more thoroughly the activities of Cluster III members in selected pilot countries that has potential for further collaboration and synergies in project delivery.

B.   National implementation in selected pilot countries

Among the pilot countries identified by the EOSG, a group of four countries (Jordan, Samoa, Senegal, and Zambia) has been proposed for initial national implementation based on the information gathered through the mapping exercise on the activities of Cluster III members. Cluster III will engage with the Member States and UN Resident Coordinator teams to take immediate action to support governments and other actors in improving the alignment of Finance, Investment, and Technology to recover better

from COVID-19 and accelerate the implementation of the SDGs.

This section details the relevant activities of Cluster III members and UN Country Teams in the four countries. Detailed action plans of Cluster III Members for other pilot countries are presented in the Annex.

Jordan

a) Level Up Accelerator

As a response to the challenges imposed by the Covid-19 pandemic, strengthening Jordan's private sector contribution to job creation and the economic inclusion of youth and women became a crucial issue. In that context, under the coordination of the UN Resident Coordinator Office (UN RCO) in partnership with the Ministry of Industry, Trade and Supply of Jordan, Jordan Enterprise Development Corporation, Jordan Exports, the Business and Professional Women Association, Change Labs and Bridge for Billion have initiated a project to create jobs for youth and women through improvement of business environment and SME competitiveness. More specifically, for fashion and garments, natural cosmetics, and food supplements sectors, the "Level Up Accelerator" was designed to facilitate the creation and growth of sustainable and inclusive businesses.

b) E-mobility in Jordan

Transportation is the main contributor to GHG emissions, thereby constituting a primary target for reducing air pollution and achieving sustainable development. Jordan's motorization rate continues to grow with high automobile dependency. In that context, there is a need for transport interventions to reach the targets of the intended nationally determined contribution (INDC). Therefore, the UN RCO in Jordan, in partnership with the Government of Jordan, the Great Amman Municipality and the Global Green Growth Initiative and the private sector, initiated an e-mobility project to electrify public transport and passenger cars. This was done through amending national strategies, laws, regulations and integrating e-mobility into the government's action plans.

c) Strengthening Implementation Design of the Artificial Intelligence Eco-system in Jordan

The UN RCO in Jordan supports a programme to build the Artificial Intelligence (AI) Ecosystem, aiming at creating job opportunities and improving the efficiency and quality of government services. The program also seeks to enhance the comprehensive social and economic development of different sectors, accelerating economic development, and creating suitable opportunities for innovation and entrepreneurship. These have the overarching objective of transforming Jordan into a regional and enabling center for information technology. The preparatory phase of this project has been recently finished, and the National AI Strategy was drafted together with the government of Jordan. The actual implementation phase will start following the mobilization of the requisite funds.

d) STI policy and policy instruments for SDGs

The purpose of the activities undertaken by the United Nations Inter-Agency Task Team (IATT) on Science, Technology and Innovation (STI) for SDGs Work Stream 6 on Capacity Building (WS6) is to build awareness and understanding concerning key aspects of STI policies and instruments. It also aims to increase the visibility of innovation and entrepreneurship, monitoring and evaluation processes, and how they relate to the SDGs. Coordinated by UNCTAD, the training is specifically targeted at STI officials, practitioners and experts from Jordan.

e) Green Chemistry Innovation Program

The purpose of this program is to ensure that social and environmental impacts, risks and liabilities

identified are effectively managed during project implementation. The program identifies the risks and specifies the mitigation measures to which UNIDO and its Project Executing Entity (Yale University) are committed, including the capacity and resource requirements necessary for the implementation of these measures.

f) eTrade Readiness of Jordan

The Assessment conducted in 2022 shows that although emergent in Jordan, e-commerce has the potential to create jobs, diversify the economy, increase exports and stimulate domestic demand. The country's strategic location, its young, tech-savvy, a strong ICT sector, and increasing numbers of start-ups in the sectors are all promising factors. The Assessment also points to specific recommendations to overcome some of the main obstacles for the country to take advantage of the digital economy and e-commerce. In order to assist the government to implement the recommendations, an Action Plan is currently underway under the leadership of MTIS, with the support of UNCTAD, to provide the Government with an operational tool to prioritize and fast-track some of the of key recommendations contained in the Assessment. The Plan will leverage on the ongoing digital cooperation programmes by development and eTrade for all partners in Jordan.

Samoa

a) Pacific Digital Economy Programme

The Pacific Digital Economy Programme (PDEP) is a joint programme between UNCDF, UNDP and UNCTAD, in support of the development of inclusive digital economies in the Pacific. The inception phase of the Programme benefits from financial support from the Government of Australia. It is a unique partnership that builds on UNCDF's long-term work on digital finance in the Pacific region and UNCTAD's extensive work in the area of e-commerce and the digital economy and is implemented with administrative support from UNDP. The PDEP includes both region-wide research and capacity building activities and country-specific activities, initially focusing on Fiji, Tonga, Samoa, Vanuatu, and the Solomon Islands. In this context, a key activity is supporting the development of national e-commerce strategies in the region, such as the one for the Solomon Islands, which is currently in its final stages.

b) Technical assistance and co-financing support for the development of a payments gateway

In 2019, SkyEye - a Samoan geospatial and IT solutions company - gained support from the United Nations Economic Commission for Asia and the Pacific (ESCAP) and the United Nations Capital Development Fund (UNCDF) to develop Samoa's first-ever home-grown interoperable payments system - MauaPay. The primary purpose of this initiative was to enhance the functionality of the Maua e-commerce app. With MauaPay in place, any bank (overseas or domestic), e-commerce platform or shop looking to shift towards digital payments can be connected to each other through a system of digital payments. This is an important move for accelerating Samoa's digital economy and opening up local businesses to the global marketplace to sell their products and services.

c) Strengthening efficient internet traffic management through internet exchange points

Pacific Small Island Developing States (SIDS) face the challenge of limited access to banking and financial systems. One of the key barriers to financial inclusion is the lack of access to affordable and quality Internet connectivity. Subregional Internet Exchange Points (IXPs) can be a cost-effective solution to improve Internet affordability, latency and traffic capacity towards financial inclusion by coordinating better Internet traffic routes within Pacific Island countries. Yet, few countries in the Pacific have established IXPs. Samoa requested the ESCAP Secretariat

and partners to facilitate consensus building and developing an arrangement on establishing a Pacific IXP. In this context, ESCAP, together with key stakeholders of Samoa, Fiji and New Zealand, is working towards the establishment of a Pacific Internet Exchange Point. It would significantly improve the quality of Internet connectivity, thereby accelerating the shift towards a digital economy in the Pacific region.

d) eTrade Readiness Assessment

The eTrade Readiness Assessment of Samoa was among the first conducted by UNCTAD in 2017. Since then, Samoa has made some advances in ICT connectivity through new submarine cable outlets, the uptake of new digital payment solutions as well as the introduction computer basics teaching in secondary schools. Samoa has also developed a national e-commerce strategy in 2022.

Senegal

a) Environmental Sound Management

The program, led by UNIDO in partnership with Ministry of Environment and Sustainable Development (MEDD) of Senegal, aims to reduce persistent organic pollutants (POPs) released from hazardous and municipal waste. This can be achieved by strengthening the technical and institutional capacities of the private sector, enabling businesses to sustain and replicate best-in-class methods and practices. These are demonstrated in the project within the context of the implementation of the National Implementation Plan (NIP) under the Stockholm Convention.

b) eTrade Readiness Assessment

In Senegal, the eTrade Readiness Assessment conducted in 2018 helped catalyze the adoption of a strategic framework to promote the development of e-commerce and the digital economy. This framework is now an integral part of the implementation approach of the National Strategy of Senegal for E-Commerce Development led by the Ministry for Trade and Small and Medium Enterprises. Building on solid ground, the government has made strides in building IT infrastructures, increasing power generation capacity, as well as in helping digital entrepreneurship to thrive through passing of a Start-up Act. E-commerce logistics is also improving through the Project JEGE, started in 2020 to create a network of pick-up points for e-commerce shipments that ensures more reliable and safe delivery of packages. According to the UNCTAD's Second Implementation Review "Fast-tracking implementation of eTrade Readiness Assessments", the government of Senegal has implemented 81% of the recommendations contained in the Assessment.

c) Biomass valorization potential

The projects identified will enable the significant reduction of greenhouse gas emissions thanks to more eff i cient waste conversion, increased forest cover, and decreased deforestation rates. This technical assistance provided by CTCN-UNEP will also help to establish a genuine industrial chain for forest biomass energy conversion using forestry waste and sawmill waste. This strategy will subsequently be strengthened through the operation of private forests planted. This will reduce pressure on native forests and increase the chances of creating a cogeneration plant that uses pyrolysis gases and waste.

d) Technical assistance on Renewable energy

The program from CTCN-UNEP provides state-of-the-art technical assistance tailored for Senegal

to harness green technologies in selected industrial agglomerations (either brown- or greenfield). Detailed strategies and implementation measures will help deploy climate technologies, including those identified in the technology needs assessment, to boost industrial competitiveness. The assistance should include technical advice as well as support to leverage finance to implement the measures prioritized.

Zambia

a) STI Policy Review

The STI policy review of Zambia has been conducted by UNCTAD in collaboration with the Government of Zambia in 2019-2021 with three fundamental goals. The first goal is to offer Zambia an assessment of the institutions, programmes and actors that make up its innovation ecosystem. The second goal is to draw attention to important socio-economic development questions for the country to which STI can make relevant contributions. Special attention is placed on gender, food, mining and digital transformation. The third goal is to provide recommendations for strengthening STI policy and to propose measures that may improve national technological capacities and encourage innovation.

b) Security audit of mobile payment applications

In Zambia, the International Communication Union (ITU) is conducting security tests and audits for mobile payment applications. The support will enable digital financial service (DFS) security regulators to build confidence and trust in the use of digital financial services, assess digital financial service provider security compliance, address digital fraud and enhance the adoption of interoperable authentication technologies.

c) Aquifer mapping technologies for Zambia

Aquifer mapping would provide an accurate and comprehensive micro-level picture of groundwater in Zambia. This aims to enable the development of a robust groundwater management plan that will provide drinking water security, improved irrigation facilities and sustainable development of water resources in rural and peri-urban areas. The CTCN-UNEP provides support by facilitating the transfer of tools and methods for assessing the latest aquifer mapping, making the information available for long-term decision processes through the use of robust methods.in Zambia. This aims to enable the development of a robust groundwater management plan that will provide drinking water security, improved irrigation facilities and sustainable development of water resources in rural and peri-urban areas. The CTCN-UNEP provides support by facilitating the transfer of tools and methods for assessing the latest aquifer mapping, making the information available for long-term decision processes through the use of robust methods.

d) Technology assessment in Agriculture and Energy

The objective of this project, led by UNCTAD, is to strengthen capacities of STI policymakers and other stakeholders in Zambia in designing and implementing policies that support the learning, diffusion and adoption of technologies in the agricultural or energy sectors. Given the shortage of capabilities in target countries in understanding the socioeconomic and environmental implications of new and emerging technologies, especially in the energy or agricultural sectors, the project aims to shed light on these so that their benefits can be harnessed, and their potentially negative effects minimized.

e) eTrade Readiness Assessment of Zambia

The eTrade Ready of Zambia conducted in 2018 and according to the UNCTAD's Second Implementation Review "Fast-tracking implementation of eTrade Readiness Assessments", the government of Zambia has implemented 69% of the recommendations contained in the Assessment. Specific measures were taken to improve the e-commerce policy environment with the creation of an E-commerce Technical Working Group in 2021 comprising line Ministries, regulatory agencies, the Post, civil society and the Bank of Zambia and the preparation of an e-commerce strategy under finalization. In terms of infrastructure, Zambia has made investments to diversify its power supply through solar and wind power and is also working on facilitating the national street addressing plans and is introducing the Electronic Postal Management System (eZamPost) to allow access to the postal services as well as multi-channel payments. This reflects a renewed impetus of the Government to facilitate the digital transition of the postal sector, as recognized in the first-ever National Postal Policy 2021-2031. In addition, cross-border e-commerce will also benefit from streamlined procedures made possible by the Zambia Trade Information Portal, a one-stop platform on information for import and export, launched in 2020 and developed with UNCTAD's assistance.

IV. Conclusion

Members within the Technology track of Cluster III on Finance and Technology should move quickly to identify specific joint actions to support the pilot countries along the broad thematic lines proposed above. The members of Cluster III should work with the UN Country Teams and other actors to support governments and other development stakeholders in their efforts to improve the alignment of Finance, Investment, and Technology to recover better from COVID-19 and accelerate the implementation of the SDGs.

The development of STI capabilities and connections among the key actors of the innovation systems of participating countries should be a common element of all actions undertaken by the Cluster. Equally critical will be the support provided to the development of STI policy frameworks, institutions, entrepreneurial ecosystems and access to innovative financial instruments for STI.

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Annex. National-level Implementation of the Cluster III: Technology Track

The FfD Initiative has identified 27 pilot countries for national-level support. A snapshot of support provided by the Cluster III Members in Technology Tracks is provided below.

	LEAD ENTITY	SUPPORT ACTIVITIES	TYPE OF ACTIVITIES
BOLIVIA	UNIDO	Environmental Sound Management (PCB, HCFs & Hg)	Technical assistance
	UNEP	Sustainable AgTech and innovation ecosystems	Capacity Building
BURKINA FASO	UNCTAD	E-trade readiness assessment, follow-up	Country assessment
	UNIDO	Environmental Sound Management (HFCs & Hg)	Technical assistance
	CTCN	EO for resilient cities planning	Technical assistance
CHILE	UNIDO	Environmental Sound Management (HFCs)	Technical assistance
	CTCN	Circular Economy Mapping	Country assessment
	CTCN	Knowledge Platform	Knowledge product
	CTCN	Small and Medium Scale Enterprises in Agri food sector	Technical assistance
	CTCN	Refrigerants	Technical assistance
	CTCN	Biodiversity Monitoring Network	Technical assistance
	UNEP	Sustainable AgTech and innovation ecosystems	Capacity Building

	LEAD ENTITY	SUPPORT ACTIVITIES	TYPE OF ACTIVITIES
COSTA RICA	UNEP	Circular Economy Assessments	Country assessment
	UNEP	Forest Management Tool	Technical assistance
	CTCN	National Information System	Technical assistance
	CTCN	Development protocol training management and implementation	Technical assistance
	UNEP	Sustainable AgTech and innovation ecosystems	Capacity Building
DRC	UNCTAD	E-trade readiness assessment	Country assessment
	UNCTAD	STI policy and policy instruments for SDGs	Capacity Building
	CTCN	Climate Technology Prioritization	Technical assistance
EGYPT	UNCTAD	E-commerce strategy	Technical assistance
	UNCTAD	Young female scientist programme	Capacity Building
	UNIDO	Environmental Sound Management (HFCs)	Technical assistance
	UNIDO	ESM (Plastics Value Chain)	Technical assistance
	UNIDO	Industrial Energy Efficiency	Technical assistance
	UNIDO	Inclusive Green Growth	Technical assistance
GHANA	UNCTAD	Firm level survey on frontier technologies deployment	Country assessment
	UNCTAD	STI policy review	Country assessment
	UNIDO	Environmental Sound Management (Mercury)	Technical assistance
	UNIDO	ASGM formalization and Gold mining	Country assessment
	UNIDO	Circular Economy Frameworks	Country assessment
	CTCN	Solar Irrigation	Technical assistance
	CTCN	eMobility Policies	Technical assistance
	CTCN	Early Warning System predictive tool	Technical assistance
GUYANA	UNEP	Sustainable AgTech and innovation ecosystems	Capacity Building
JAMAICA	UNCTAD	E-trade readiness assessment	Country assessment
	CTCN	National Climate Research priorities	Country assessment
	UNEP	Sustainable AgTech and innovation ecosystems	Capacity Building

LEAD ENTITY	SUPPORT ACTIVITIES	TYPE OF ACTIVITIES
JORDAN		
UNCTAD	E-trade readiness assessment	Country assessment
UNCTAD	STI policy and policy instruments for SDGs	Capacity Building
UNIDO	Conversion of Waste to Energy	Technical assistance
UNIDO	Green Chemistry Innovation Program	Technical assistance
UNIDO	Environmental Sound Management (HFCs)	Technical assistance
CTCN	Waste recycling Plant	Technical assistance
CTCN	Laboratory for Lighting product testing	Technical assistance
CTCN	Project Proposal for Financing	Capacity Building
KAZAK-HSTAN		
UNCTAD	Support in e-commerce and law reform	Technical assistance
ITU	Financing feasibility study for schools' connectivity, mapping of schools	Country assessment
UNECE	Development of Smart Sustainable City Profile of Nur-Sultan + setting in motion of climate infrastructure project concept & connection to financiers	Knowledge product
UNECE	Development of Smart Sustainable City Profile of Almaty + setting in motion of climate infrastructure project concept & connection to financiers	Knowledge product
KENYA		
UNCTAD	E-trade readiness assessment	Country assessment
UNCTAD	E-commerce strategy	Technical assistance
UNCTAD	Measuring e-commerce and the digital economy	Country assessment
UNCTAD	Technology transfer for development	Capacity Building
CTCN	Develop Circular Economy Road maps for large appliances	Technical assistance
CTCN	Prefeasibility of Direct Use of Geothermal energy	Country assessment
CTCN	Agro Forestry Policy	Technical assistance
CTCN	Technology Identification	Technical assistance
CTCN	Water Technologies	Technical assistance
CTCN	Refrigeration Technologies and Policies	Technical assistance
ITU	Mapping. Financial National coverage and digitally-enabled education, digital skills. Accelerate pilot	Technical assistance

LEAD ENTITY	SUPPORT ACTIVITIES	TYPE OF ACTIVITIES
KYRGY-ZTAN		
CTCN	Building Codes development	Technical assistance
CTCN	Climate Technology prioritization	Technical assistance
ITU	Mapping and country pilot for schools and community connectivity	Country assessment
UNECE	Development of Smart Sustainable City Profile of Bishkek + development of climate infrastracture project concept & connection to financiers	Knowledge product
UNECE	People-first Public-Private Partnerships (PPPs) for the SDGs - UNECE will support the development of an INFF in the Kyrgyz Republic through the promotion of People-first PPPs to attract private finance for the the delivery of infrastructure projects and public services contributing to achieving the SDGs.	Capacity Building
LIBERIA		
UNCTAD	E-trade readiness assessment, follow-up	Country assessment
CTCN	Food Security	Technical assistance
MON-GOLIA		
UNCTAD	E-trade readiness assessment	Country assessment
CTCN	Sustainable Technology Identification	Technical assistance
MORO-CCO		
UNIDO	Environmental Sound Management (HFCs)	Technical assistance
UNIDO	Environmental Sound Management (PCBs and POPs)	Technical assistance
MOZAMBIQUE		
UNCTAD	STI policy and policy instruments for SDGs	Capacity Building
CTCN	Technology Asessmesnt for Financing Mechanism	Technical assistance
CTCN	Waste to Energy	Technical assistance
MAURI-TANIA		
UNCTAD	STI policy review	Country assessment

	LEAD ENTITY	SUPPORT ACTIVITIES	TYPE OF ACTIVITIES
NIGERIA	UNCTAD	Technology transfer for development	Capacity Building
	UNCTAD	Cropwatch innovative cooperation programme	Technical assistance
	UNCTAD	Young scientist program for SDGs	Capacity Building
	UNIDO	Climate technology mitigation and adaptation assessment	Country assessment
	UNIDO	Environmental Sound Management (Mercury)	Technical assistance
	CTCN	Priority Climate Technologies Prioritization	Country assessment
	CTCN	Gender and Energy	Capacity Building
	ITU	Security assurance framework for digital finance	Capacity Building
	ITU	Development of sustainable financial models for schools and community connectivity, case study	Country assessment
PAPUA NEW GUINEA	UNCTAD	Pacific Digital Economy Programme	Capacity Building
	CTCN	Refrigeration and AC	Country assessment
SAMOA	UNCTAD	E-trade readiness assessment, follow-up	Country assessment
	UNCTAD	Pacific Digital Economy Programme	Country assessment
	ESCAP	Technical assistance and co-financing (grant) support for the development of a payments gateway	Technical assistance
	ESCAP	Strengthening efficient Internet traffic management through Internet Exchange Points	Capacity Building
SENEGAL	UNCTAD	E-trade readiness assessment, follow-up	Country assessment
	UNIDO	Environmental Sound Management (POPs)	Technical assistance
	CTCN	Renewable Energy	Technical assistance
	CTCN	Biomass Valorization Potential	Country assessment
	CTCN	Coastal Hazard Management	Technical assistance
	CTCN	Industrial Technologies	Technical assistance
SUDAN	UNIDO	Minamata Assessment	Country assessment
	CTCN	Hotspot Mapping Tool	Technical assistance
TURKMENISTAN	UNIDO	Environmental Sound Management (HFCs)	Technical assistance

ZAMBIA

LEAD ENTITY	SUPPORT ACTIVITIES	TYPE OF ACTIVITIES
UNCTAD	E-trade readiness assessment, follow-up	Country assessment
UNCTAD	Technology transfer for development	Capacity Building
UNCTAD	Cropwatch innovative cooperation programme	Technical assistance
UNCTAD	Technology assessment in Agriculture or Energy	Country assessment
UNCTAD	STI policy review	Country assessment
UNIDO	Environmental Sound Management (HFCs)	Technical assistance
CTCN	Aquifer Mapping	Technical assistance
CTCN	Circular Economy Roadmaps	Technical assistance
CTCN	Appliances Energy Standards	Technical assistance
ITU	Security audit of mobile payment applications	Knowledge product