International Water Management Institute

RESOURCE RECOVERY & REUSE SERIES 24

ISSN 2478-0529

24

Assessing the Investment Climate to Promote a Circular Bioeconomy: A Comparison of 15 Countries in the Global South

Avinandan Taron, Abinaya Sathiskumar, Trapti Malviya, Susanne Bodach, Sairam Muthuswamy and Solomie Gebrezgabher

ATHENA INFONOMICS

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The Resource Recovery and Reuse (RRR) Series originated in 2014 under the CGIAR Research Program on Water, Land and Ecosystems (WLE), and continues since 2021 under the CGIAR Initiatives on Resilient Cities and Nature-Positive Solutions. The aim of the RRR series is to present applied research on the safe recovery of water, nutrients, and energy from domestic and agro-industrial waste streams. IWMI's research on RRR aims to create impact through different lines of action research, including (i) developing and testing scalable RRR business models, (ii) assessing and mitigating risks from RRR for public health and the environment, (iii) supporting public and private entities with innovative approaches for the safe reuse of wastewater and organic waste, and (iv) improving rural-urban linkages and resource allocations while minimizing the negative urban footprint on the peri-urban environment. IWMI works closely with the World Health Organization (WHO), Food and Agriculture Organization of the United Nations (FAO), United Nations Environment Programme (UNEP), United Nations University (UNU), and many national and international partners across the globe. The RRR series of documents present summaries and reviews of the research and resulting application guidelines, targeting development experts and others in the research for development continuum.

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Acknowledgements

The authors thank Duleesha Nisansala, Consultant, IWMI, Colombo, Sri Lanka, for helping to identify and review the environmental and waste management regulations in different countries.

This work was finalized under the CGIAR Initiative on Resilient Cities and Nature-Positive Solutions. The authors are grateful for the support of CGIAR Trust Fund contributors (www.cgiar.org/funders).

Citation: Taron, A.; Sathiskumar, A.; Malviya, T.; Bodach, S.; Muthuswamy, S.; Gebrezgabher, S. 2024. *Assessing the investment climate to promote a circular bioeconomy: a comparison of 15 countries in the Global South*. Colombo, Sri Lanka: International Water Management Institute (IWMI). 89p. (Resource Recovery and Reuse Series 24). doi: https://doi.org/10.5337/2024.218

Keywords: / resource recovery / resource management / reuse / circular economy / bioeconomy / investment / regulations / frameworks / policies / guidelines / business models / governance / infrastructure / incentives / corruption / access to finance / financial inclusion / funding / lending / taxes / legislation / contracts / private sector / public institutions / waste management / Sustainable Development Goals / organic fertilizers / composting / renewable energy / biogas / entrepreneurs / markets / competitive behaviour / awareness-raising / indicators / developing countries / Global South / North Africa / West Africa / East Africa / South America / South East Asia / South Asia / Ethiopia / Kenya / Rwanda / Egypt / Burkina Faso / Ghana / Colombia / Peru / Bangladesh / India / Nepal / Sri Lanka / Cambodia / Philippines / Vietnam /

ISSN 2478-0510 (Print)
ISSN 2478-0529 (Online)
ISBN 978-92-9090-966-8

Front cover photograph: Mee Ko Dong (Shutterstock photo ID: 2016729548).

Series editor (science): Pay Drechsel, IWMI
English editor: Robin Leslie
Designer: Dinuk Senapatiratne

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ACRONYMS AND ABBREVIATIONS

ACEN	Africa Circular Economy Network
AGRA	Alliance for a Green Revolution in Africa
BMGF	Bill & Melinda Gates Foundation
CBE	Circular Bioeconomy
CDM	Clean Development Mechanism
CGGI	Chandler Good Government Index
CPI	Corruption Perceptions Index
EoDB	Ease of Doing Business
FDI	Foreign direct investment
GCI	Global Competitiveness Index
GNI	Gross National Income
GW	Gigawatt
IWMI	International Water Management Institute
LPI	Logistics Performance Index
MENA	Middle East and North Africa
MSME	Micro, small to medium enterprise
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PO	Public organization
QIP	Qualified investment projects
RGB	Rwanda Governance Board
RGS	Rwanda Governance Scorecard
RRR	Resource Recovery and Reuse
SDG	Sustainable Development Goal
SIPAS	Satisfaction Index of Public Administrative Services
UNDP	United Nations Development Programme
UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNU-INWEH	United Nations University – Institute of Water Health and Environment
WEF	World Economic Forum
WGI	Worldwide Governance Indicators

SUMMARY

Linearity in resource consumption with unprecedented waste generation has put pressure on environmental systems, and one of the solutions to this concern is a shift towards a circular economy. **The circular economy approach encompasses three perspectives – (1) eliminate waste and pollution, (2) circulate products and materials at the highest value and (3) regenerate nature.**

A circular bioeconomy (CBE), a niche sector within the circular economy, derives goods and services from recovered resources to promote sustainable growth through regenerative practices. This involves different processes that convert biomass from different waste streams into marketable products such as organic fertilizers (compost or biochar) or energy (common products such as biogas, charcoal or charcoal briquettes) to provide fuel, power or heat. This is a growing necessity for economies where urbanization is growing rapidly and the agricultural sector needs to meet the growing demand and transition to a bio-based economy. Closed resource loops are necessary to ensure resource conservation and sustainable growth for future generations.

However, the transition has been slow and countries are struggling with the need for significant investment. Along with investments, new businesses and business models are required. **Private entities can close the gaps by contributing to technical expertise and innovation, providing services and capital investment (or cofinancing).** However, entrance of the private sector is slow, and its presence is limited to certain parts of the value chain.

The private sector requires appropriate regulations, financing mechanisms, evolved markets with the required infrastructure and well-defined contractual frameworks. Operating in countries where the enabling factors are minimal or weak proves extremely challenging for private enterprises. **A facilitating environment on the other hand increases scalability and replicability of sustainable projects, accelerating the transition to a CBE.**

The present study uses secondary literature and databanks to assess the investment climate for promoting a CBE based on different indicators. **The main indicators used for the assessment are existing regulatory frameworks; business climate and associated procedures; governance in provision of infrastructure and incentive systems; access to finance; and entrepreneurial ecosystems.** While most of the countries analyzed indicated evidence of regulations on waste management and policies related to promoting circularity, the divide is mainly on aspects related to business environments, access to finance and governance. The World Bank's Ease of Doing Business and the Global Competitiveness Index (GCI) indicate that Southeast Asian and Latin American countries are better positioned than other Asian and African countries, except for India, Rwanda and Kenya.

South Asian countries (India and Bangladesh) are top performers in governance, followed by Latin America countries (Colombia, Peru) and Southeast Asian countries (Vietnam and the Philippines). African countries, except for Rwanda and Egypt, are low performers. Meanwhile, infrastructure investment per capita is higher in Peru and Colombia compared to other countries, although Vietnam and Egypt are close competitors. The study indicates the potential from green bonds towards investments is growing in India and Colombia. The study reveals that Peru, Colombia and the Philippines are leading in terms of providing opportunities for establishing a CBE. India, Bangladesh, Vietnam, Egypt, Rwanda, Kenya are Ghana are emerging centers for circular businesses. In other countries either the business environment/governance is not developed to attract entrepreneurs (Cambodia, Sri Lanka, Nepal), and/or there is low market potential (Burkina Faso, Ethiopia) which deters growth. Most of these economies are challenged by factors such as awareness and education, investment in infrastructure, supportive policies and regulations, market development for recycled products and technological advancements. Overcoming these barriers can help foster the widespread adoption of a CBE.

1

INTRODUCTION

1.1. Towards a Circular Bioeconomy (CBE)

The world is progressing towards an era of new possibilities and interventions juxtaposed by the strengthening of sustainable development. To establish balance between future looking technology and basic amenities such as clean water and sanitation, economic reforms are formulated and implemented periodically. Current global imperatives are now requiring adoption of the circular economy concept, which is the practice of reducing dependency on (new) natural resource extraction while making the most of available resources through alternative uses (Tan and Lamers 2021) using the 3Rs principle (reduce, reuse and recycle).

The concept of circular economy focuses on the **resource recovery and reuse (RRR)** of materials from waste streams and emphasizes the importance of waste as a potential resource. This approach aims to (1) reduce the amount of waste sent to landfills or other disposal sites, (2) circulate products and materials at their highest value generating economic, social and environmental benefits by regenerating nature. The CBE, on the other hand, is more of a niche sector within the ambit of a circular economy. This approach involves the transformation of biomass into a range of value-added products and materials, such as biofuels, bioplastics and biofertilizers, through a combination of biological, chemical and physical processes. It focuses on processing biomass from different waste streams into marketable products such as organic fertilizer and bioenergy.[1] This is a growing necessity for economies where urbanization is growing rapidly, and the agricultural sector needs to meet the growing demand. Transition to a bio-based economy can close resource loops to ensure resource conservation and sustainable growth for future generations. For example, urban waste is rich in water, nutrients, energy and organic compounds that can be treated for recycling purposes. Circular projects therefore have the potential for supporting green economies and restoring nature, enhancing food security, protecting human health, reducing waste, contributing to cost recovery systems and creating livelihoods.

However, the transition towards a CBE needs investments, new businesses and business models. The involvement of the private sector is paramount in closing the gap because the private sector can be expected to contribute technological expertise and innovations, organizational capabilities, marketing expertise and leverage capital inflow. In contrast, the public sector needs to complement this with a regulatory framework and help its enforcement, provide infrastructure, plan public investments, involve and educate stakeholders, ensure waste supply and provide market assistance. Promoting such enabling factors would promote the scalability and replicability of sustainable projects accelerating the transition to a CBE.

[1] Organic fertilizer is usually compost-based; it is also known by the public as biofertilizer, soil conditioner, humus or 'manure'. Bioenergy can refer to biogas or, for example, briquettes made from sawdust, wood chips and/or charcoal.

This approach involves the transformation of biomass into a range of value-added products and materials:

eg. biofuels, bioplastics and biofertilizers

Circular projects have the potential to support green economies and restore nature, enhance food security, protect human health, reduce waste, contribute to cost recovery systems, and create livelihoods.

Circular Bioeconomy

Circular economy

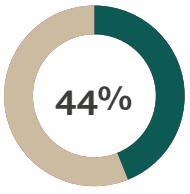
This approach aims to (1) reduce the amount of waste sent to landfills or other disposal sites; and

(2) circulate products and materials at their highest value, generating economic, social and environmental benefits by regenerating nature.

focuses on the **resource recovery and reuse (RRR)** of materials from waste streams.

emphasizes the importance of waste as a potential resource.

Globally, the largest waste category is **food and green waste**



food and green waste constitutes 44% of global waste in the countries studied

Based on the CBE and resource recovery and reuse concepts, **this report focuses on** a qualitative assessment across different countries to assess their efforts to promote resource recovery (from organic solid and liquid waste) for reuse in nutrient and/or energy sectors, based on different criteria such as regulatory and infrastructure frameworks as well as access to finance, business support services and markets.

The objective of this regional report is to document and assess the investment climate for promoting the CBE in 15 selected countries globally (Figure 1). These countries are in East Africa (Ethiopia, Kenya, Rwanda); North Africa (Egypt); South America (Colombia, Peru); South Asia (Bangladesh, India, Nepal and Sri Lanka); Southeast Asia (Cambodia, the Philippines and Vietnam); and West Africa (Burkina Faso and Ghana). The report aims to provide a holistic assessment of commercial prospects and the preparedness of countries for adopting approaches for circular economy practices with a focus on food and organic waste, agro-industrial waste, wastewater, septage and reutilization of septic or sewage sludge.

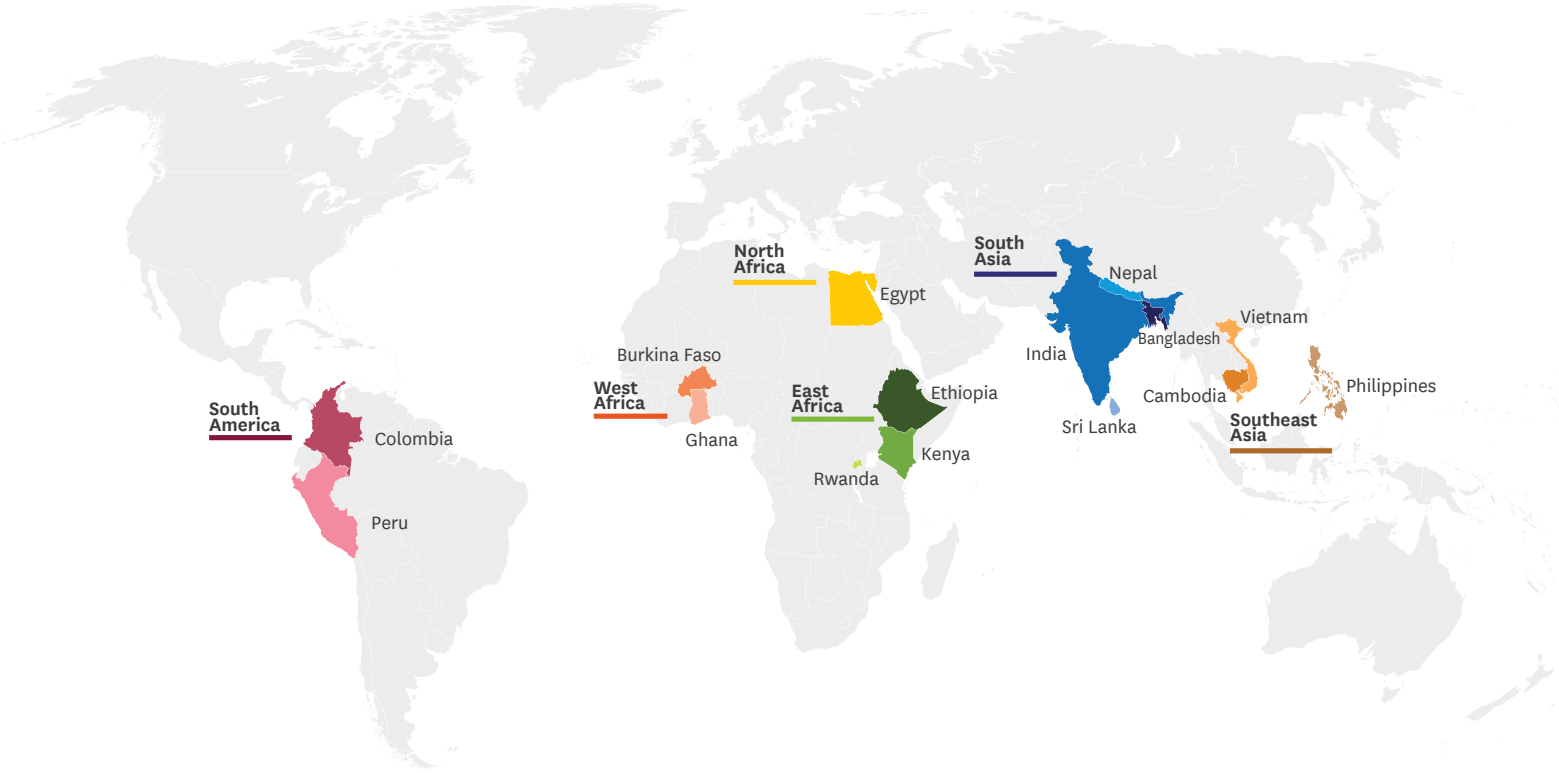


FIGURE 1. Developing countries selected for assessing the investment climate to promote the CBE.

Source: Author.

As stated above, the overall objective of the assessment is to understand the critical challenges for a favorable investment climate, compare the progress towards achieving a CBE and documenting best practices that could be replicated in other countries. Although the report presents extensive facts and figures, its essence is in providing a comprehensive view of the RRR ecosystem and its commercial viability. To better understand the commercial aspects and viability of the CBE framework, this report seeks to analyze the prevailing legal, financial and operational landscapes across the countries studied. The analysis uses secondary information collected from research articles published in academic journals, data on international indices (such as the World Bank's Ease of Doing Business, the Global Competitive Index, Worldwide Governance Indicators, the Chandler Good Government Index and so forth), reports from international agencies, think tanks and corporations as well as grey literature.

The study uses the following ***five*** indicators to assess the investment climate:

Regulatory framework:

This indicator reviews the institutional arrangements and organizations related to the CBE sector. It covers regulations related to solid and liquid waste management as well as environmental mandates that govern businesses engaged in resource recovery and reuse of different waste streams such as wastewater, agro-waste and municipal solid waste.

Business climate and associated procedures:

This indicator assesses competitiveness of the economy and ease of doing business, which are important for entrepreneurs when setting up and operating businesses within an economy.

Governance climate:

This indicator focuses on the nature of governance, for example provision of infrastructure, incentives for promoting businesses and reviews from secondary data entrepreneurial perspectives on corruption and dissatisfaction about governance.

Access to finance:

This indicator addresses the financial aspects of CBE businesses such as sources of capital, the financial strengths of each country, lending rates and inclusiveness in finances.

Entrepreneur ecosystems:

This indicator collects and analyzes information on existing and potential markets, and business networks for promoting such transition.

However, it should be noted that the CBE is a dynamic and developing concepts and the countries selected have significant developmental challenges. As such, the sources cited are not exhaustive, but merely illustrative of the broad methodical approach adopted by the research team to collate the relevant information for analysis and conclusions.

2

REGULATORY FRAMEWORK

To analyze the investment climate of the CBE, the study reviewed environmental regulations, solid and liquid waste management ordinances, relevant policies and strategies on circular economy and fiscal policies. Proper regulations and policies with execution by the relevant public organizations are essential for business functions. Hence, the study analyzes the enforcement and stringency conditions to measure the performance of the regulations across selected countries which would provide an idea of whether the formulation of future policies and strategies related to circular bioeconomy is easily implementable.

2.1. Public Organizations and Laws, Policies and Guidelines

Each country is gradually introducing changes in governing structures with respect to government agencies and public organizations related to RRR. The studied countries have multiple ministries/departments and government-owned organizations which work in support of the RRR sector and the CBE generally, with no specific segregation of fields, for instance the ministries related to environment and/or climate change has overlapping functionalities. Table 1 gives an overview of such organizations in the studied countries and Annex 1 provides details of the existing regulations related to the CBE in the respective countries.

TABLE 1. Public organizations (POs) that support RRR in the studied countries.

Region	Countries	POs related to nutrient recovery	POs related to water	POs related to energy	Environment (cross-cutting)	Total organizations related to RRR
East Africa	Ethiopia	0	6	0	1	7
	Kenya	0	0	1	6	7
	Rwanda	0	0	0	8	8
North Africa	Egypt	0	3	0	3	6
West Africa	Burkina Faso	0	0	0	3	3
	Ghana	0	2	1	7	10
South America	Colombia	0	2	0	6	8
	Peru	0	3	0	2	5
South Asia	Bangladesh	1	1	1	6	9
	India	0	1	2	9	12
	Nepal	0	0	4	4	8
	Sri Lanka	1	1	0	6	8
Southeast Asia	Cambodia	0	0	0	7	7
	Philippines	0	3	2	7	12
	Vietnam	0	1	0	3	4

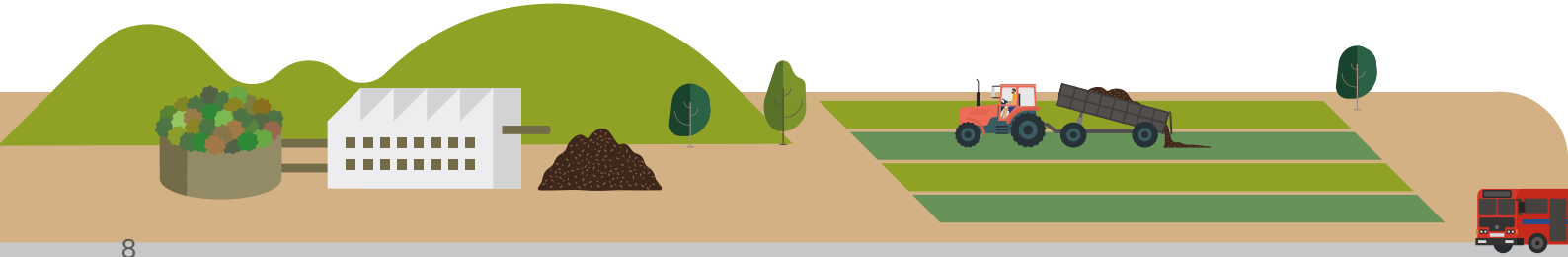
Source: Authors' survey

Each country has defined laws and regulations governing the activities of the sector especially waste management laws, and environmental standards. In most countries, solid waste management is a local responsibility, by default or through decentralization policies. The private sector is typically engaged through management or concession contracts for collection, treatment and disposal of solid waste. Broadly, the environment ministry governs the policy directives and implementation of RRR enterprises in all the countries studied. Almost all the countries across the regions have established institutions with responsibilities for policy development and regulatory oversight in the waste sector as well as environment management. Table 2 shows key legal instruments including acts, policies, guidelines, regulations, laws and codes functioning in the countries across different components of the sector (details are provided in Annex 1).

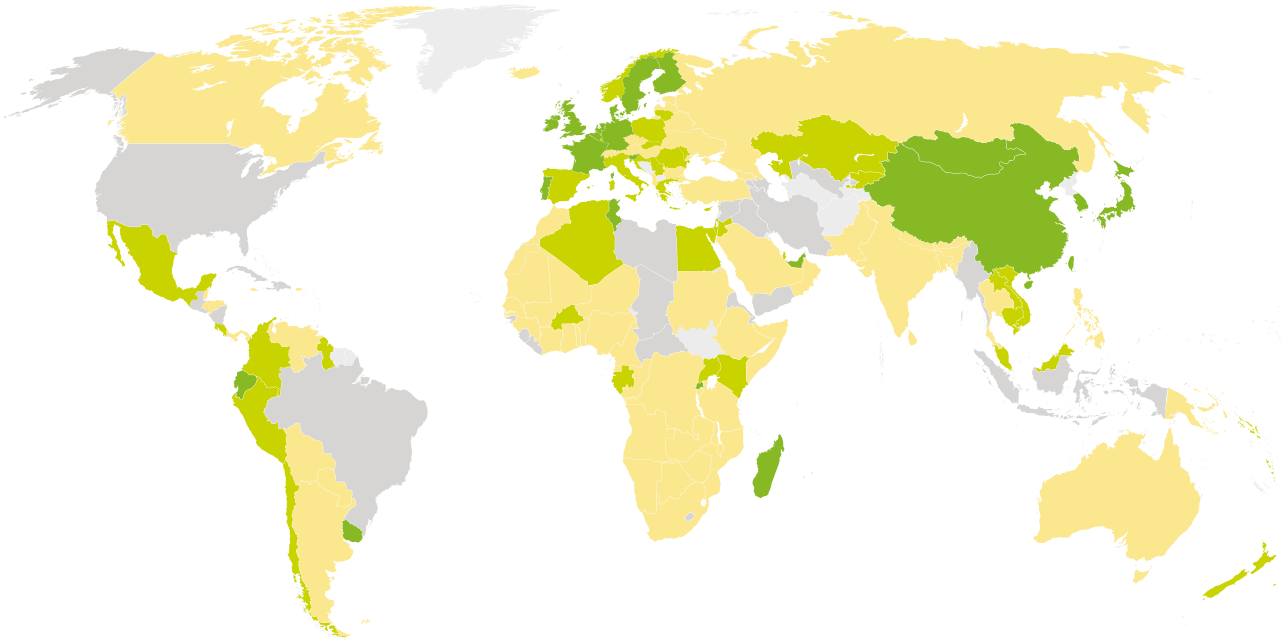
TABLE 2. Key legal instruments functioning across the RRR sector in the studied countries.

	East Africa			North Africa	West Africa		South America		South Asia				Southeast Asia		
Area	Ethiopia	Kenya	Rwanda	Egypt	Burkina Faso	Ghana	Colombia	Peru	Bangladesh	India	Nepal	Sri Lanka	Cambodia	Philippines	Vietnam
Environmental protection and environmental standards			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Circular (bio)economy	✓	✓	✓			✓	✓	✓				✓	✓	✓	✓
Solid waste management (incl. waste segregation)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wastewater management	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
Sanitation and fecal sludge management	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓
Renewable energy covering biogas and biomass	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Soil management	✓	✓	✓		✓	✓	✓	✓	✓			✓	✓		✓
Recovery and reuse		✓	✓	✓	✓		✓	✓	✓	✓	✓		✓		✓
Sewerage and sewage treatment (including manuals/guidelines)	✓	✓	✓	✓	✓	✓		✓	✓	✓					✓
Waste-to-energy	✓	✓	✓			✓	✓			✓	✓		✓		✓
Compost standards and further RRR relevant standards/guidelines	✓	✓	✓		✓		✓	✓	✓	✓			✓		✓
Incentives for organic fertilizer	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓		✓

Source: Authors' survey.



While considering maturity assessment of the federal and national regulations towards circular economy, a study by Weick and Ray (2022) indicated that countries in Latin America, East and West Africa and Southeast Asia are in the progressive stage of transition. Figure 2 shows that Peru, Colombia, Cambodia and Vietnam have made regulatory frameworks concerning the resource recovery sector including policies and strategic action plans. Similarly, Kenya, Rwanda, Ethiopia, Burkina Faso and Egypt have developed resource recovery specific frameworks. The other countries, although having progressed with environmental and waste management policies, have yet to progress further towards circularity.



Value	1	2	3	4
Level	Basic	Initiated	Progressive	Mature
Description	Waste management and recycling	Fiscal policy, EPR, product policy	Roadmap	National circular economy policy

No data available

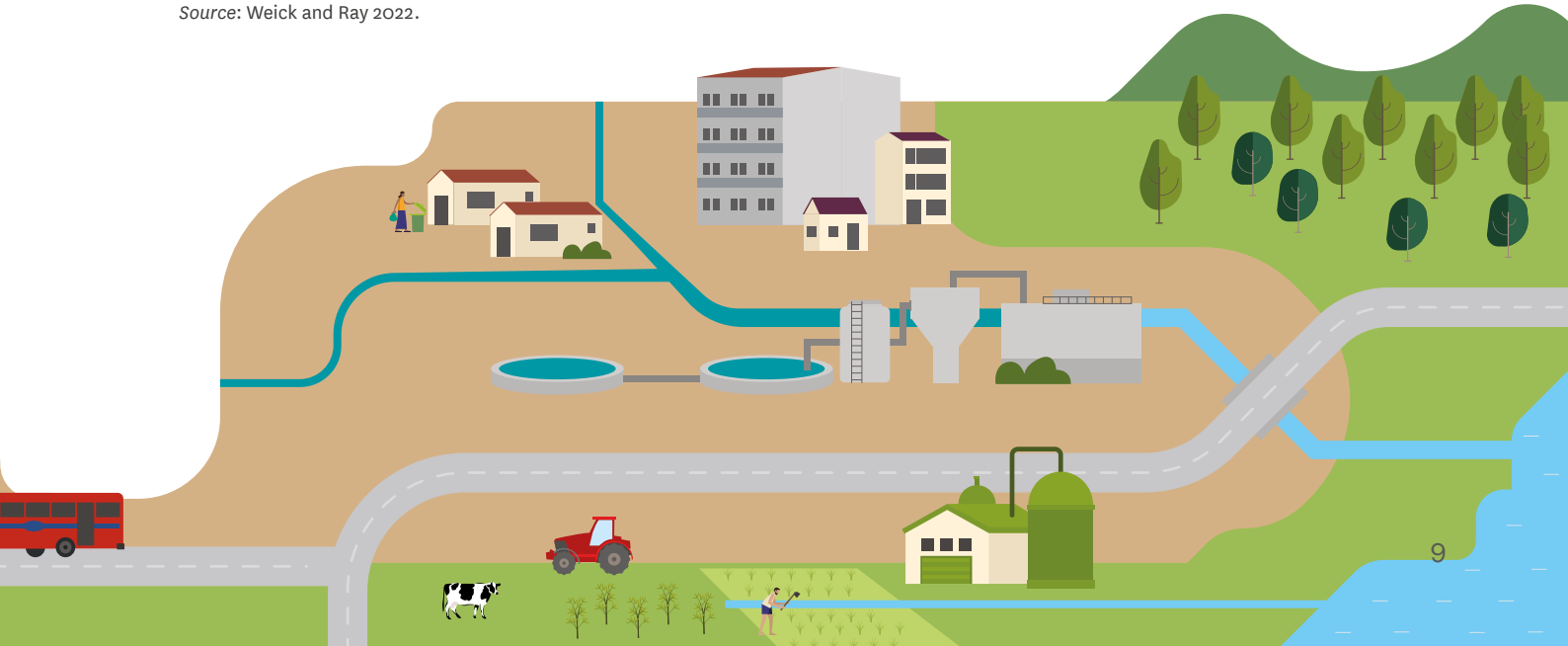
Note:

Maturity levels are not cumulative.

EPR - Extended Producer Responsibility.

FIGURE 2. Maturity assessment of circular economy legislation rated on a scale of 1 to 4.

Source: Weick and Ray 2022.



However, not all ministries and public agencies in these countries are efficient and many fail to enforce regulations. WEF (2013) and Koziuk et al. (2019) analyzed stringency and enforcement of environmental regulations. In these studies, each country was given a score according to a scale of 1 to 7, where 1 corresponded to the lowest possible score and 7 corresponded to the highest possible score. The parameters included the stringency of environmental pollution standards, sophistication of regulatory structure, quality of the environmental information available, the extent of subsidization of natural resources, the strictness of enforcement and the quality of environmental institutions. In the present study, the country scores are compared to the regional scores. As shown in Figure 3, Rwanda, Kenya, India, Sri Lanka, Peru and Colombia have better performance in terms of stringency and enforcement within their respective regions. The study shows that low scores on enforcement can be attributed to poor coordination among departments/agencies, lack of access to information and restrained civic engagement.

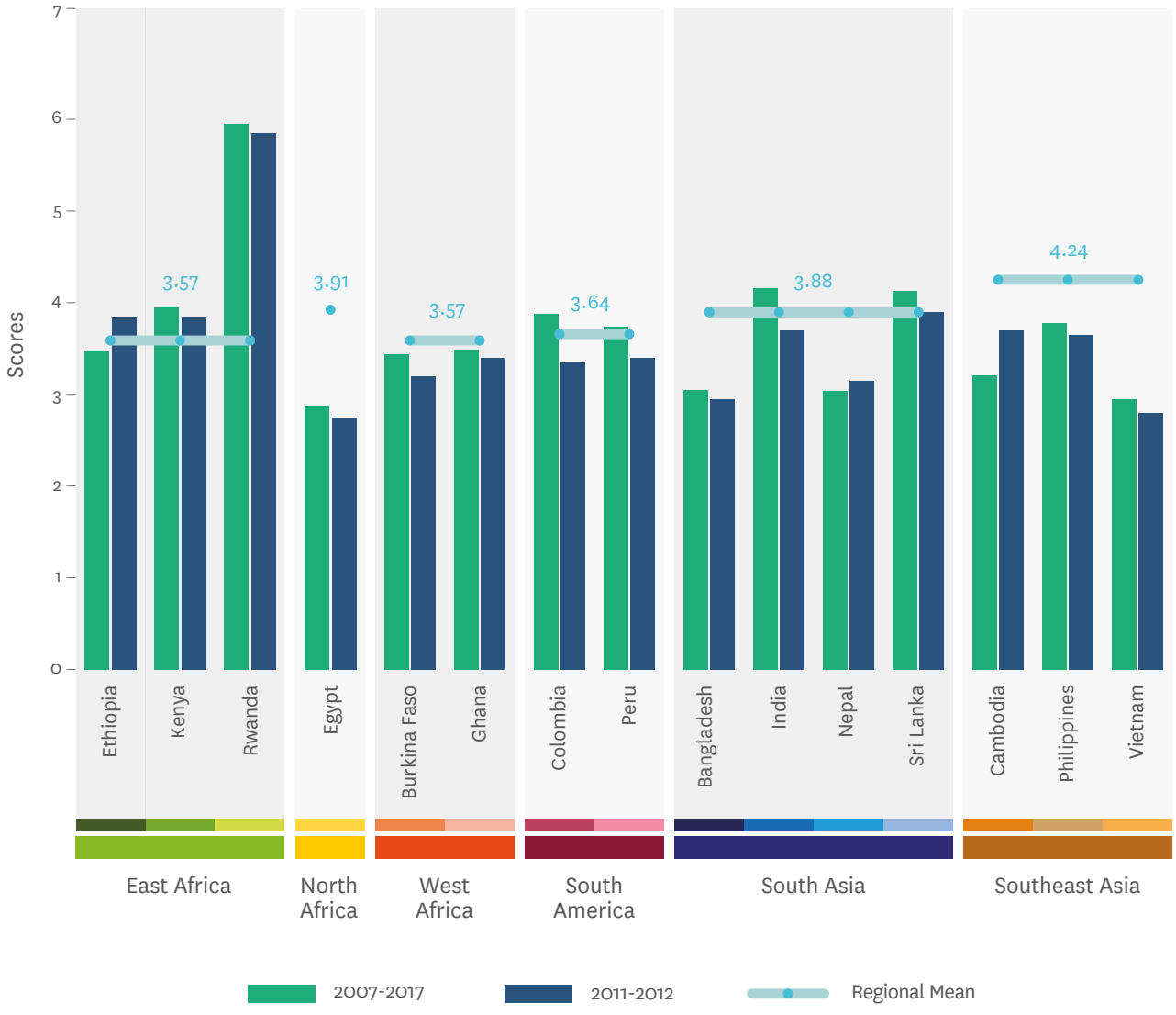


FIGURE 3. Stringency and enforcement of environmental regulations across selected countries.

Source: WEF 2013 and Koziuk et al. 2019.

The process of mixing dried fecal matter to eventually produce fertilizer pellets, Bangladesh.
Photography by Neil Palmer / IWMI

2.2. Conclusion

There are four areas which are either covered under holistic laws/policies/guidelines or have had specific regulations passed: (1) solid waste management (including waste segregation), (2) wastewater management, (3) sanitation and fecal sludge management, and (4) renewable energy, covering biogas and biomass. Along with waste management policies and regulations, environmental standards and policies are reviewed. In most countries, public organizations/agencies do cover these domains under administrative norms highlighting their awareness. However, apart from Peru, Cambodia, Vietnam, Egypt, Rwanda, Kenya and Burkina Faso, the circularity agenda has not progressed significantly. The enforcement of environmental regulations in Colombia, Peru, India, Sri Lanka, Rwanda, Ethiopia and Kenya is above average. This analysis has implications for the transition towards the CBE. It is evident that Peru, Colombia, Kenya and Rwanda have made substantial progress towards promoting a CBE for entrepreneurs in terms of implementing new regulations.

All other developing countries without the circularity component, need to formulate policies and strategies directed towards tapping resources from waste streams. This can be achieved through partnerships and coordination among public agencies, academia and business networks for policy formulation. For example, Vietnam formed the Circular Economy Hub with support from the United Nations Development Programme (UNDP) and Institute of Strategy and Policy on Natural Resources and Environment (ISPONRE), to promote a circular framework. Secondly, countries with federal structures where both centers and the state can conduct regulation and monitoring need more coordination within public organizations/agencies. Thirdly, some countries lack policy enforcement capacity. This is evident in Egypt, Cambodia, and the Philippines, where the potential for law enforcement in waste and environmental management is low, leading to lower resource recovery.

3

BUSINESS CLIMATE AND ASSOCIATED PROCEDURES

The overall performance and the prevailing business climate vary considerably across countries and regions, leading to differentiating scores and consequently, difference in rankings among the countries. To understand the focused RRR business climate, there is a need to understand the overall business climate and the procedures associated with it that are applicable to all the RRR business initiatives. The World Bank's Ease of Doing Business (EoDB) scores and ranks countries and regions individually upon a holistically determined criterion.

3.1. Regional Scores under the Ease of Doing Business (EoDB) Index

The EoDB scores economies between 0–100 (worst to best) based upon their performance in the **10 topics** consisting of 41 indicators. These topics include:

(i) starting a business
(ii) dealing with construction permits
(iii) getting electricity
(iv) registering property
(v) getting credit
(vi) protecting minority investors
(vii) paying taxes
(viii) trading across borders
(ix) enforcing contracts
(x) resolving insolvency

The index divides the economies into **seven regions** namely:

1. East Asia and Pacific (25 economies)
2. Europe and Central Asia (23 economies)
3. Latin America and Caribbean (32 economies)
4. Middle East and North Africa (MENA, 20 economies)
5. Organisation for Economic Co-operation and Development (OECD) high-income (34 economies)
6. South Asia (8 economies)
7. Sub-Saharan Africa (48 economies)

Calculating the EoDB score for each economy involves two main steps:

In the first step, the scores of each 41 component indicators are normalized to a common unit (except for total tax and contribution rate). The scores are rescaled using a linear transformation (worst - indicator score for the economy)/(worst - best). The best/worst score represents the economies obtaining highest/lowest scores on the specific indicator. Both the best and worst performance are established every 5 years based on the available data and remain in that level for the 5 years regardless of any changes in the interim years.

In the second step, the scores obtained for individual indicators for each economy are aggregated through simple averaging into one score, first for one topic and then across all 10 topics.

3.2. General Business Climate

In terms of scoring, regionally, OECD high income remains the most performant region with a score of 78.4, followed by Europe and Central Asia (73.1). Among the selected countries, in terms of regional distribution, East Asia and Pacific with a score of 63.3 remains the best performer, followed by Middle East and North Africa (60.2), Latin America and Caribbean (59.1), South Asia (58.2) and Sub-Saharan Africa (51.8) as shown in Figure 4a. Notably, even among regions that have overall low scores, such as South Asia and Sub-Saharan Africa, certain countries within the regions have experienced performance improvements in their individual scores between 2016 and 2020 (Figure 4b), namely India (54.7–71), Vietnam (62.1–69.8), Rwanda (68.1–76.5) and Kenya (58.2–73.2). A few other countries such as Cambodia and Peru have shown a decrease in their scores, while the remainder have shown a negligible improvement in the scores over the past 5 years (World Bank 2016, 2017, 2018, 2019a, 2020a).

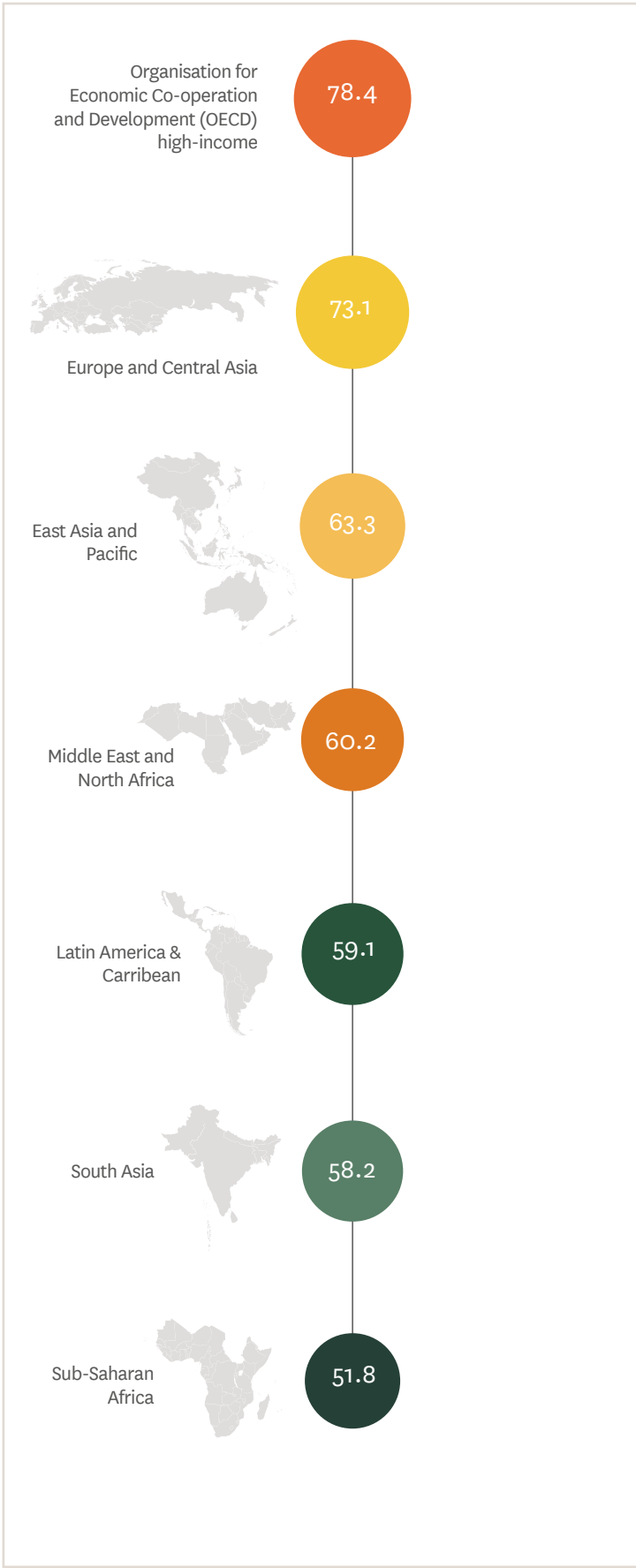


FIGURE 4a. EoDB scores (2020).

Source: World Bank 2020a

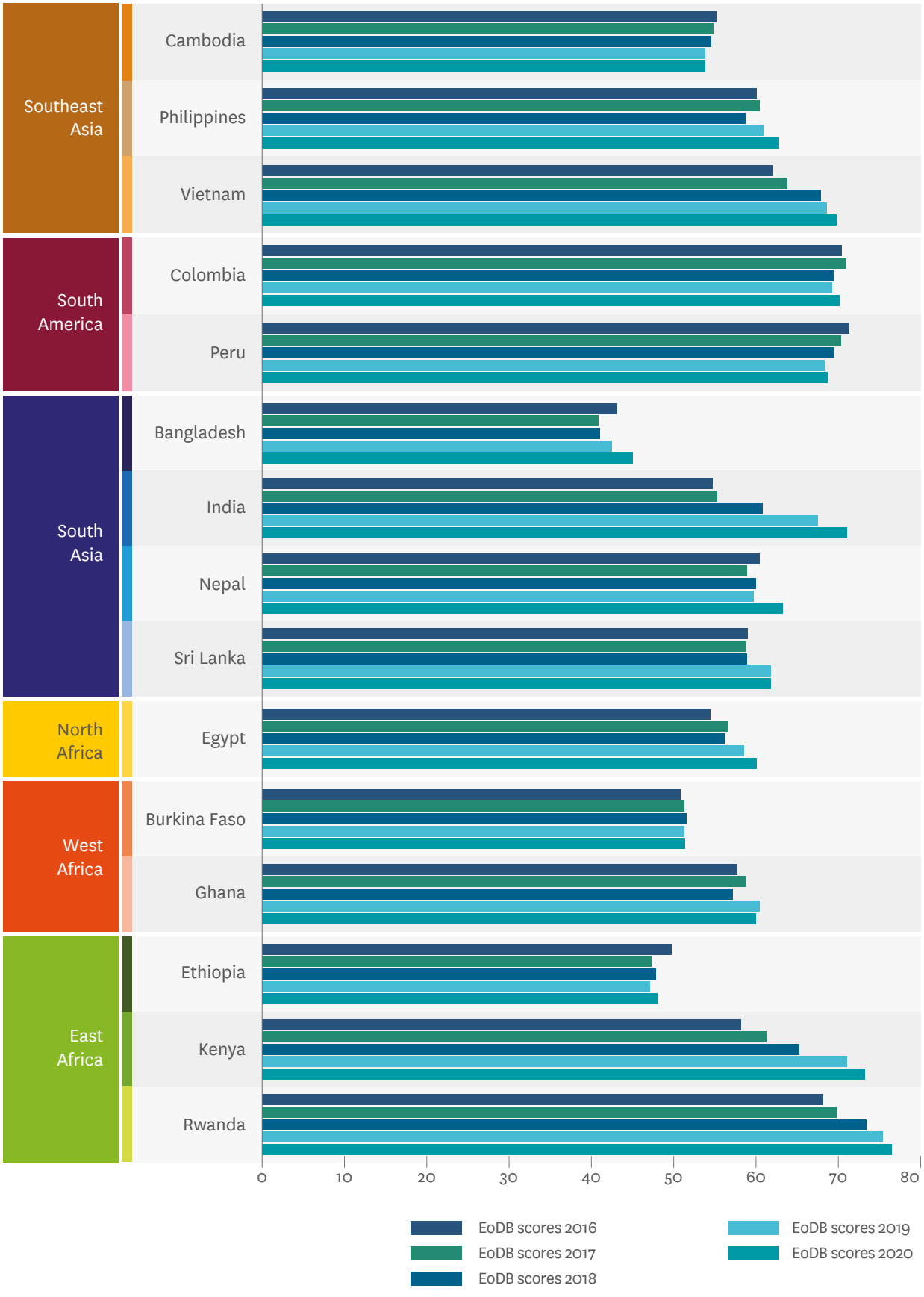


FIGURE 4b. Comparison of EoDB scores between 2016 and 2020 for the selected countries.

Source: World Bank 2016, 2017, 2018, 2019a and 2020a

Table 3 presents a broad overview of the overall rankings and the regional rankings of the selected countries as well as their individual scores in the indicators of starting a business, construction permits, getting electricity, registering property and paying taxes. A brief definition of each of the indicators by the World Bank is given in Annex 2.

TABLE 3. Comparative ranks and scores of selected countries across EoDB parameters.

Regions as per the World Bank EODB data	Regions as per the classifications in the report	Country	Ranks within the region	Starting a business	Construction permits	Getting electricity	Registering property	Paying taxes
Sub-Saharan Africa		**Mauritius**	1	94.5	85.8	88	82.5	94
	East Africa	Ethiopia	29	71.7	59.7	60.1	50.9	63.3
		Kenya	3	82.7	67.6	80.1	53.8	72.8
		Rwanda	2	93.2	70.6	82.3	93.7	84.6
	West Africa	Burkina Faso	25	88.2	68.7	29.4	51.4	55.9
		Ghana	13	85	67.6	77.4	59.4	56
Middle East and North Africa		**UAE**	1	94.8	89.8	100	90.1	85.3
	North Africa	Egypt	12	87.8	71.2	77.9	55	55.1
Latin America and the Caribbean		**Mexico**	1	86.1	68.8	71.1	60.2	65.8
	South America	Colombia	6	87	69.1	76.3	71.2	58.6
		Peru	3	82.1	72.5	74.5	72.1	65.8
South Asia	South Asia	**India**	1	81.6	78.7	89.4	47.6	67.6
		Bangladesh	7	82.4	61.1	34.9	29	56.1
		Nepal	3	81.7	67.3	60.9	63.6	47.1
		Sri Lanka	4	88.2	72.3	74.5	51.9	59.8
East Asia and Pacific		**Singapore**	1	98.2	87.9	91.8	83.1	91.6
	Southeast Asia	Cambodia	18	52.4	44.6	57.5	55.2	61.3
		Philippines	11	71.3	70	87.4	57.6	72.6
		Vietnam	8	85.1	79.3	88.2	71.1	69

Source: World Bank 2020a, 2020b

In Table 3, countries are compared with respect to the regional best-performing countries. The data show that India is leading the South Asian region, followed by Nepal and Sri Lanka. In Latin America, Mexico is followed by Peru and Colombia. In Sub-Saharan Africa, Rwanda and Kenya obtained higher ranks comparing to Mauritius. Apart from these countries, others are comparatively lower ranked. Similarly, within the MENA region, Egypt is far behind the leader (United Arab Emirates). Cambodia and the Philippines in East Asia, although trailing behind Singapore and Vietnam, are gradually progressing, as shown in temporal data previously.

Cabbage crop under sprinkler irrigation from groundwater, White River, South Africa.
Photography by E.L.S.K.E Photography / IWMI

Under the EoDB, time taken to start a business and cost incurred while starting business procedures provide key insights into how efficient and effective the institutional mechanisms are and how they perform under the broader business climate. Figure 5 provides an overview of selected countries and their performance in terms of the number of days taken to start a business while Figure 6 provides information about how the costs are incurred by an individual while registering and starting a commercial entity within the country. Across the selected countries, Rwanda by far remains the best in terms of time (number of days) taken while starting a business. On average, it takes 4 days to open a business in Rwanda, with zero procedural costs for a micro, small to medium enterprise

FIGURE 5. Time taken to start a business (in days) across selected countries in different regions.

Source: World Bank 2019b.

(MSME). Cambodia remains the most significant laggard, requiring over 3 months for the procedures to complete from start to finish, taking over four times more time than the world average of 20 days. Rwanda again remains the best placed. For MSMEs, the cost of starting a business remains zero, as a 2-year exemption is provided to them for paying the registration tax. Following Rwanda, Vietnam takes the lead, requiring just 5.6% of the Gross National Income (GNI) per capita income. Cambodia remains by far the most expensive country, requiring over half of the per capita income (53.4%) followed by Ethiopia (45.4%).

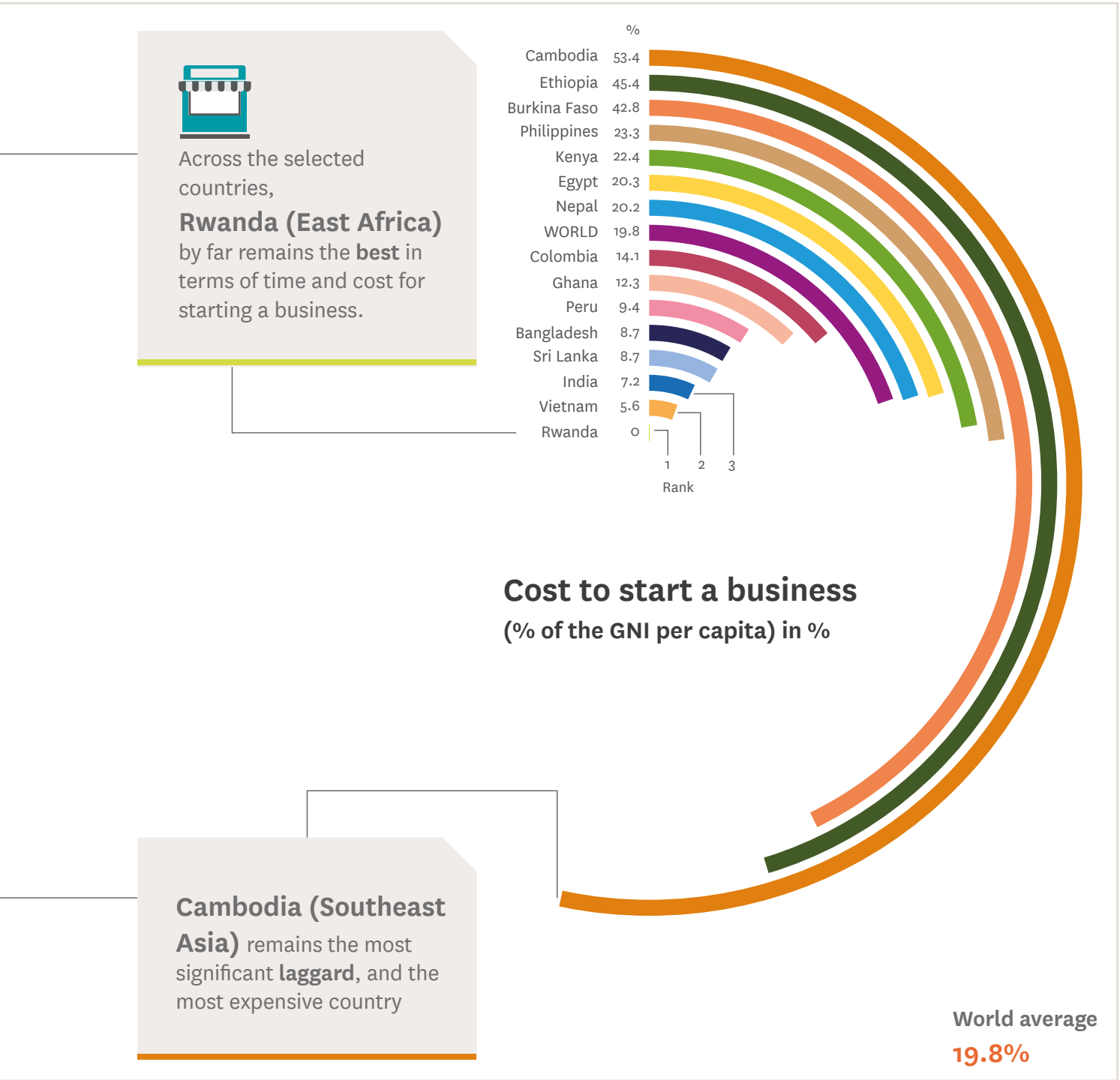


FIGURE 6. The cost of starting a business (% of GNI per capita).

Source: World Bank 2019c

3.3. Performance Based on the Global Competitiveness Index

Competitiveness remains crucial for countries as well as regions, as a highly productive country can mobilize larger intellectual and financial capital, drive innovation and consolidate greater, transferrable gains. Across regions, Singapore remains the premier country, in both its respective region, i.e. East Asia, as well as the world. Notably, within the selected countries, Colombia, ranked at 57, remains the most competitive, followed by the Philippines (64), Peru (65), Vietnam (67) and India (68). From selected African countries, the best performant country is Egypt (93) followed by Kenya (95) and Rwanda (100) (Figure 7). Country-wise performance across different parameters used in the GCI is given in Table 4.

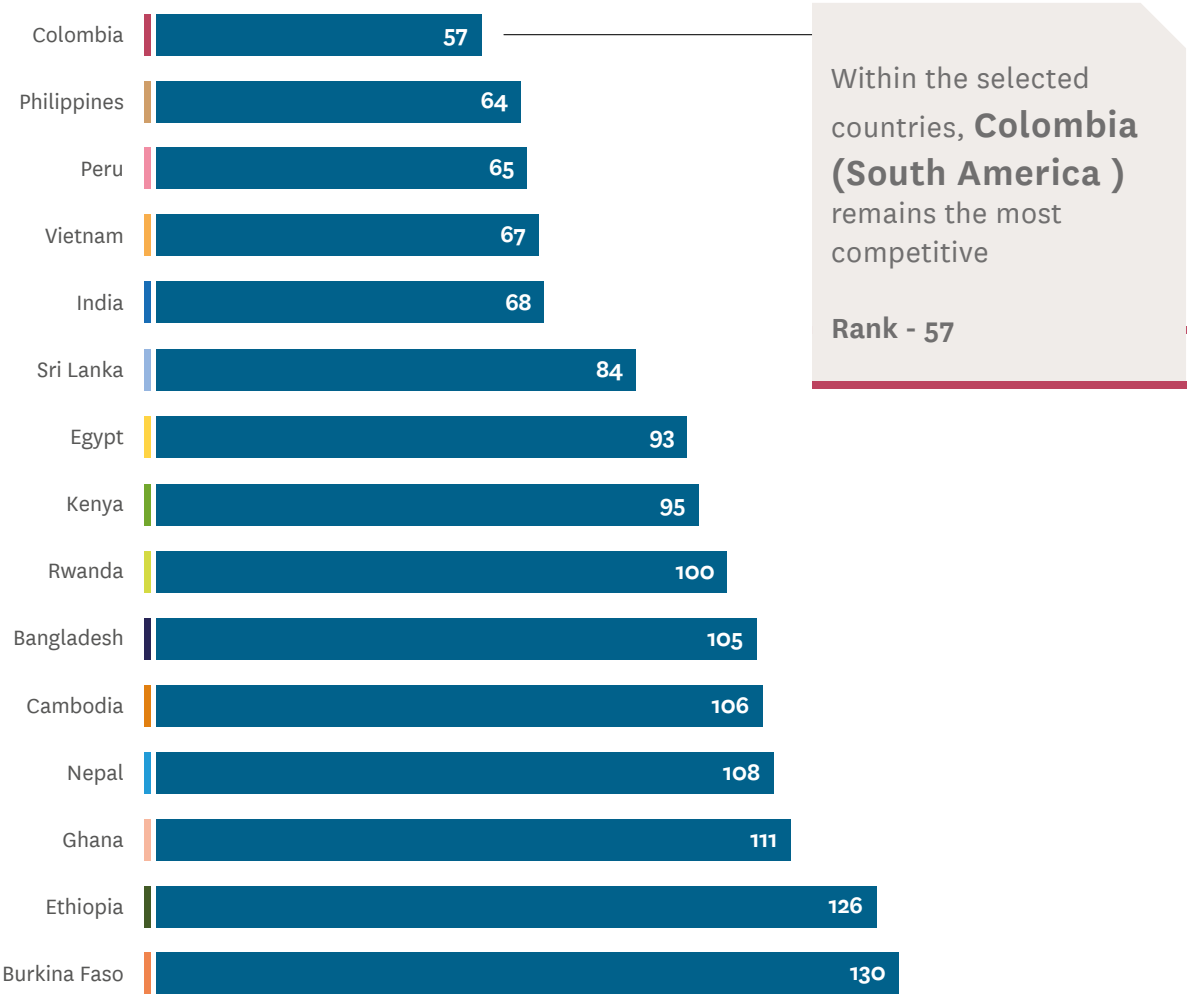


FIGURE 7. Rankings of selected countries under the Global Competitiveness Index (GCI) 2019 (lower is better).

Source: GCI 2019.

TABLE 4. Country-wise performance at a glance adopted from the GCI 2019 Index.

Region	Country	Overall rank (out of 141)	Enabling environment				Human capital		Markets				Innovation ecosystem	
			Institutions	Infrastructure	ICT Adoption	Macroeconomic stability	Health	Skills	Product market	Labor market	Financial services	Market size	Business dynamism	Innovation capability
East Africa	Ethiopia	126	126	123	137	127	108	137	135	124	107	63	131	118
	Kenya	95	68	110	116	100	116	97	88	79	78	72	51	78
	Rwanda	100	36	111	111	96	107	128	66	45	90	129	46	100
North Africa	Egypt	93	82	52	106	135	104	99	100	126	92	23	95	61
West Africa	Ghana	111	69	118	90	132	119	102	85	93	116	65	102	89
	Burkina Faso	130	95	134	129	64	133	138	103	113	127	114	122	133
South America	Colombia	57	92	81	87	43	16	80	90	73	54	37	49	77
	Peru	65	94	88	98	1	19	81	56	77	67	49	97	90
South Asia	Bangladesh	105	109	114	108	95	93	117	119	121	106	36	121	105
	India	68	59	70	120	43	110	107	101	103	40	3	69	35
	Nepal	108	103	112	109	90	100	109	132	128	51	85	98	112
	Sri Lanka	84	79	61	107	118	43	66	131	118	87	58	70	84
Southeast Asia	Cambodia	106	123	106	71	75	105	120	113	65	88	84	127	102
	Philippines	64	87	96	88	55	102	67	52	39	43	31	44	72
	Vietnam	67	89	77	41	64	71	93	79	83	60	26	89	76

Source: GCI 2019.

3.4. Conclusion

EoDB data show that over time, countries like Vietnam, India, Egypt, Ghana and Rwanda have improved their rankings indicating the gradual evolution of an enabling environment for entrepreneurs. In 2020, the rankings for Peru, Colombia, India, Kenya and Rwanda, projected a higher comparative advantage for the investors in comparison to the other countries. For example, in Rwanda, the cost and time taken to initiate a business is 4 days with zero procedural fees and a 2-year exemption for paying the registration tax. In contrast, an entrepreneur takes over 3 months and it costs about USD 2,500 to initiate a business. A regional analysis shows that in Latin America and South Asia the cost and time to start a business is comparatively attractive.

To complement the EoDB, the GCI was used, as it uses indicators that extend beyond the enabling environment, such as human capital, markets and innovation ecosystems. This index is more comprehensive as it considers both microeconomic and macroeconomic foundations of the economy to provide a guide on the productivity of the economy. This index indicates that countries like Peru, Colombia, India, Vietnam and the Philippines are comparatively more attractive destinations for entrepreneurs. In contrast, African countries like Rwanda, Egypt and Kenya, although better in terms of EoDB (World Bank 2020a), score lower in overall competitiveness.

4

GOVERNANCE CLIMATE: INFRASTRUCTURE, INCENTIVES, CORRUPTION AND SATISFACTION

The effectiveness, accessibility and nature of the governance climate are contingent upon which sectors are responsible and/or contribute to the greater share of the economy. Therefore, policies and decisions taken for major sectors shape the larger regulatory and governance environment, introducing both opportunities as well as limitations. The countries studied in this report are still developing, and while the significance of technological status, taxation policies and level of satisfaction vary among them, all of these factors contribute extensively to their economies, indicating both extensive opportunities for enterprises related to RRR as well as challenges owing to the limited availability of skilled labor, technological skills and other critical operational resources.

4.1. Infrastructure Conditions across Regions

Infrastructure, such as transportation, communications, sewerage and electricity, is regarded as a vital for economic progress in low-income countries. Efficient and dependable infrastructure services are critical for economic growth and have a significant impact on the investment climate of developing countries (Raihan 2011).

The Global Infrastructure Outlook forecasts infrastructure investment needs and gaps and compares forecasts globally across 56 countries for the year 2040. According to The Global Infrastructure Hub, Cambodia needs to invest USD 28 billion in infrastructure between 2016 and 2040 to sustain its growth. Colombia's rise in the rankings reflects recent advances in infrastructure, stability and institutional development. However, Colombia's infrastructure remains underdeveloped in comparison to regional peers such as Peru, which leads the South American region (U.S. Department of Commerce 2024). Egypt's infrastructure is underdeveloped and has a higher investment gap when compared to other African countries. Kenya has extensive, but uneven, infrastructure that is still superior to that of its neighbors (U.S. Department of Commerce 2019). Today, the world invests approximately USD 2.5 trillion per year in transportation, power, water and telecommunications systems that businesses and populations rely on. However, this amount continues to fall short of the world's ever-increasing needs, resulting in lower economic growth and lack of essential services for countries. The data in Figure 8 show significant infrastructure asset gaps in the developing countries of the South Asian and African regions. The countries in the African region have a USD 1.7 trillion infrastructure investment shortfall. South America, on the other hand, has a greater investment imbalance of USD 6.5 trillion. South Asian countries have the highest infrastructure deficit of USD 15 trillion.

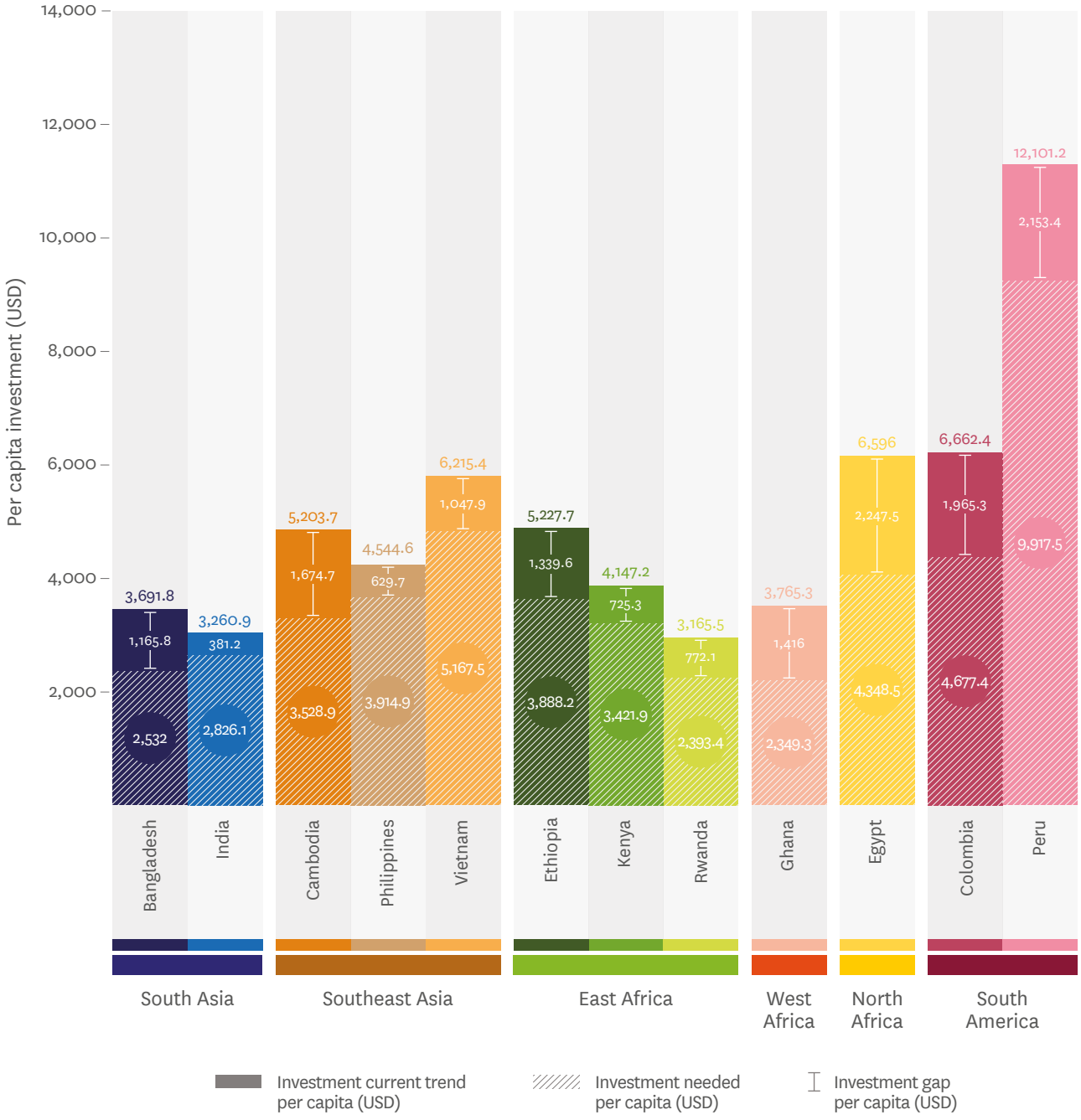


FIGURE 8. Projections for total infrastructure investment across regions for the year 2040.

Source: Global Infrastructure Outlook 2022.
Note: Data for Burkina Faso, Nepal and Sri Lanka were not available.

The Global Infrastructure Outlook forecasts investment needs and trends across infrastructural sectors including energy, water, telecommunications and transport services (Figure 9). All the amounts for investment are in US dollars (per capita). Peru would require huge investment in roads with respect to its population and, in comparison, with other countries. For all the 15 countries analyzed in this report, the energy sector would require maximum investment as it is the most critical infrastructure sector for developing countries.

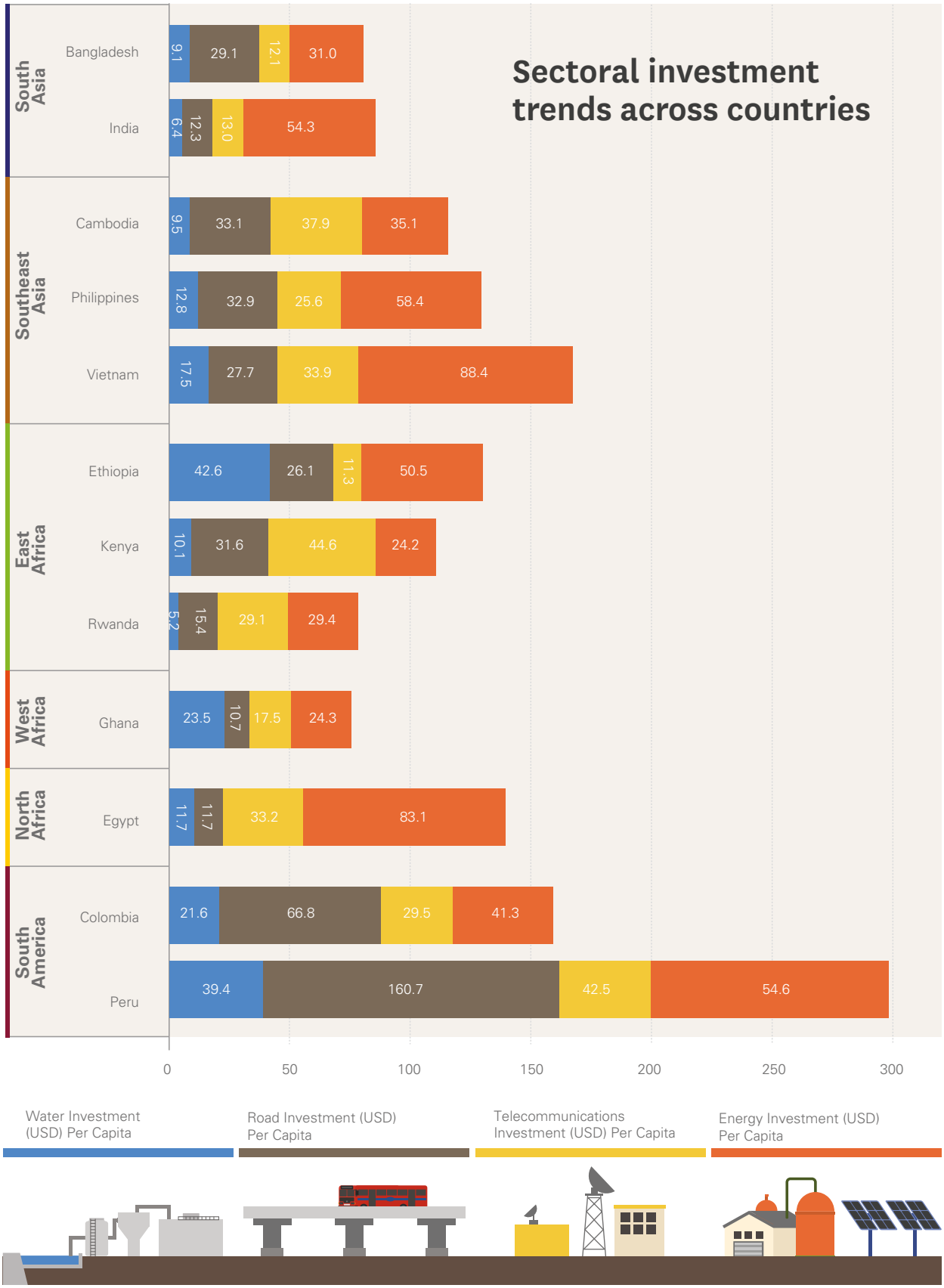


FIGURE 9. Sectoral investment trends across countries for 2022.

Source: Global Infrastructure Outlook 2022.
Note: Data for Burkina Faso, Nepal and Sri Lanka were not available.

Sukhdev Vishwakarma and his daughter Meenu, both farm workers, use water pumped from a solar water pump at the farms of Gurinder Singh in Jagadhri, India. Photography by Prashanth Vishwanathan / IWMI

Most of the countries in South Asia and Southeast Asia have experienced considerable investment over the last few years, with India having a current investment trend of USD 75 billion followed by Vietnam and the Philippines. There have been some notable examples of developing economies mobilizing funds for clean energy projects, such as India's achievement in financing the rapid development of solar photovoltaic panels in pursuit of its 450 gigawatt (GW) renewable energy objective by 2030. The COVID-19 pandemic also broke the pattern of steady progress toward universal access to electricity and clean cooking in some of the low-income countries in Africa and South Asia. Access to electricity is a major challenge across African countries and the number of people without access to electricity is expected to rise in the coming years (IEA 2016). Most of the countries across South Asia and Africa, both emerging and developed, have paid insufficient attention to maintaining and expanding their infrastructure assets, resulting in economic inadequacies and the deterioration of critical systems. Traffic jams, congested ports, power outages, degenerating dams and contaminated water supplies in South Asia and Africa are clear indications that national infrastructure needs cannot be delayed indefinitely. Provision of road infrastructure and telecommunication services are further investment priorities for countries across Africa and South Asia.

4.1.1. Access to electricity

Access to electricity is paramount for establishing any business in any country and improved access to electricity results in consistent national growth. Access by the larger population is directly proportional to the availability of electricity across regions of a country, creating a supportive environment to establish a business. Although obtaining a grid connection is different for domestic and business purposes, in this section we focus on access to electricity in the studied countries over time, which has been conducive for sustaining a business (Figure 10).

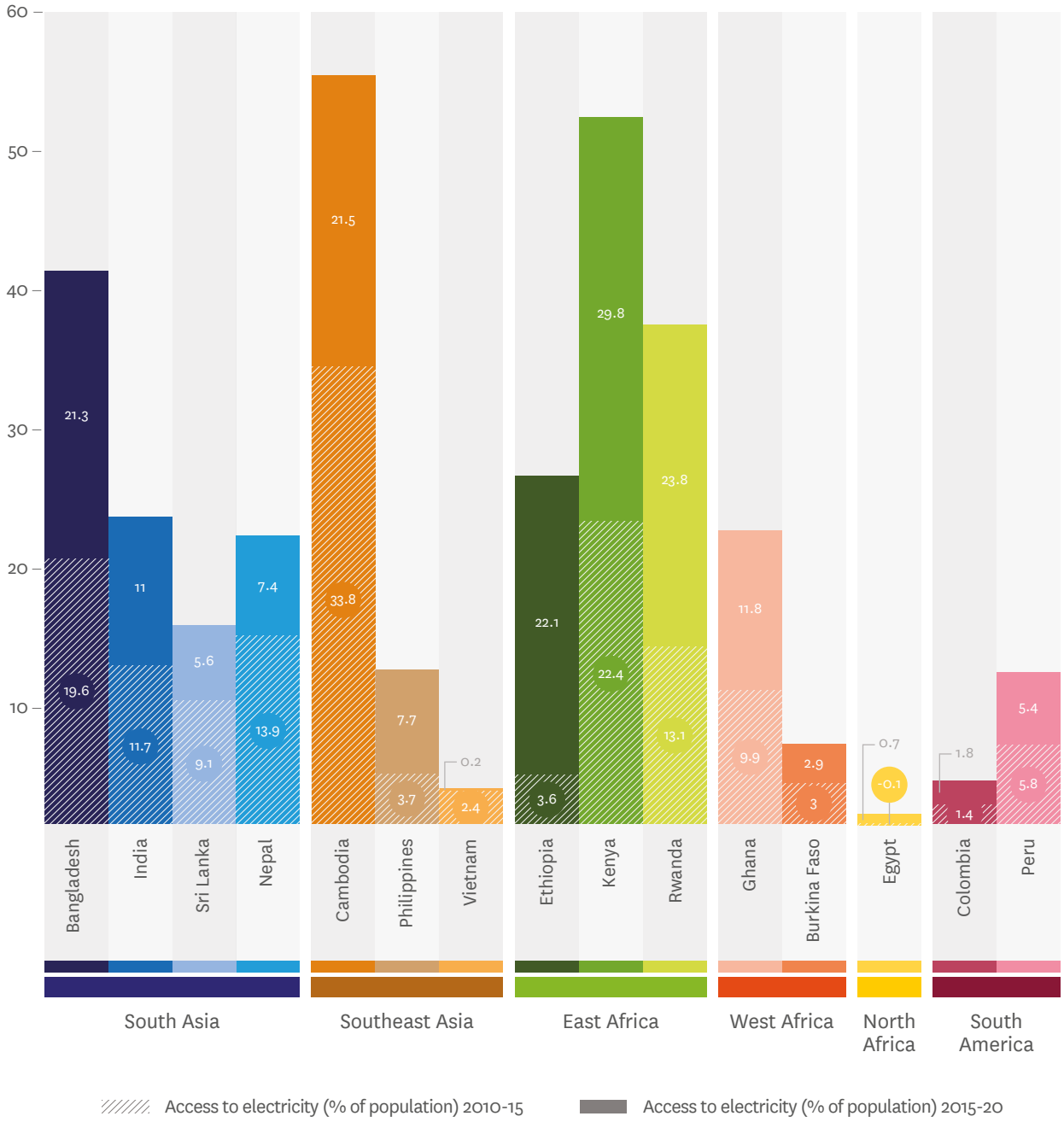


FIGURE 10. Increase in access to electricity (% of the population) in the countries studied.

Source: World Bank 2023a.

4.1.2. Access to water

Based on the investment trends, access to water has minimum attention across the countries studied. However, water is the most crucial element for any activity. To facilitate smooth infrastructure establishment, the availability of freshwater is significant. Figure 11 indicates annual freshwater withdrawal (reference year 2017) by industries from the 15 countries studied. This provides insight on how much these industries consume with respect to total freshwater withdrawal. In Colombia more than 27% of the freshwater is utilized by industries followed by the Philippines (17%).

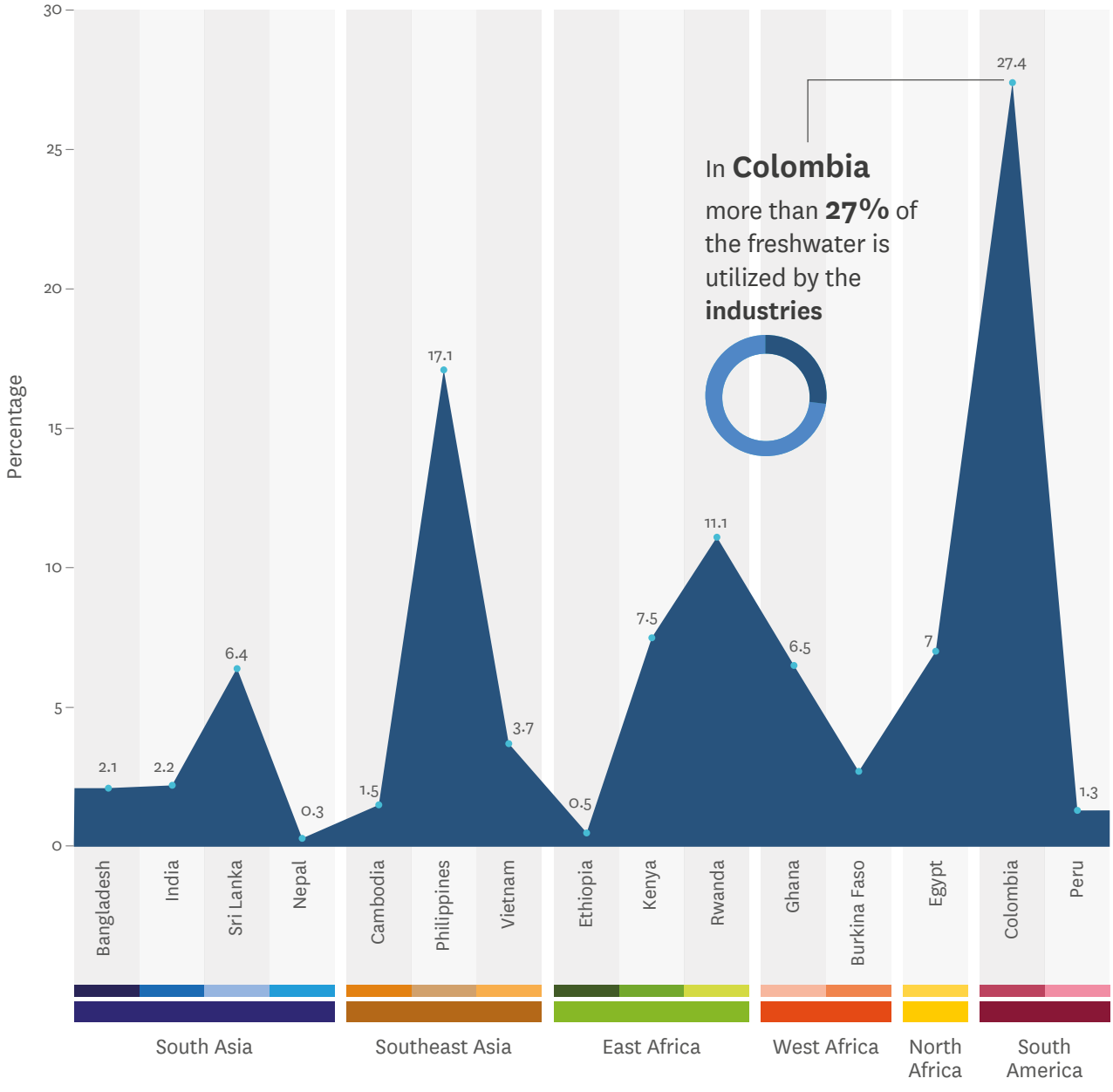


FIGURE 11. Annual freshwater withdrawal by industries in 2017

Source: Our World in Data 2018.

4.2. Logistical Status across Countries

Logistics play a vital role in establishing sound infrastructure systems that enable enterprises to flourish in an economy. Based on the World Bank's Logistics Performance Index (LPI), for the last 10 years, only a few countries have witnessed continuous rise. The capacity of developing countries to efficiently move goods and connect manufacturers and consumers with international markets is improving, albeit slowly, as captured in Table 5. Countries such as India, Colombia and Vietnam show a steady development in logistics as the data suggest.

TABLE 5. LPI for the countries under study (1 = low, 5 = high).

Region	Countries	POs related to nutrient recovery	POs related to water	POs related to energy
East Africa	Ethiopia	NA	NA	NA
	Kenya	2.43	2.8	NA
	Rwanda	2.27	3	2.8
North Africa	Egypt	2.98	2.8	3.1
West Africa	Burkina Faso	2.32	2.6	2.3
	Ghana	2.51	2.6	2.5
South America	Colombia	2.87	2.9	2.9
	Peru	2.94	2.7	3
South Asia	Bangladesh	NA	2.6	2.6
	India	3.08	3.2	3.4
	Nepal	2.04	2.5	NA
	Sri Lanka	2.75	2.6	2.8
Southeast Asia	Cambodia	2.56	2.6	2.4
	Philippines	3.02	2.9	3.3
	Vietnam	3	3.3	3.3

Source: World Bank 2023b.

4.3. SDG Expenditure on RRR-Related Goals with Respect to Total SDG Expenditure

The emergence of the Sustainable Development Goals (SDGs) has led to governments around the world integrating them into federal planning frameworks and ensuring that programmatic interventions and policy-making remain in appropriate consonance with the broader United Nations goals. However, the alignment is not consistent and varies considerably across countries. Furthermore, while SDGs are to be effectively interpreted as development guiding markers, the expenditure and allocation for development do not necessarily follow through from the lens of SDGs, and rather often are reversely correlated and/or incidentally come within the aegis of one or many SDGs, as the state and/or private actors draw out developmental plans and work.

For example, Bangladesh has been active in developing a comprehensive SDG monitoring framework, with necessary indicator-based ministerial allocations and planning

outlays. The cost is estimated to be nearly USD 1 trillion between the implementational period of 2017 and 2030, with the government estimating an additional cost of USD 66 billion *per annum*, to cater and incorporate the SDGs into the existing development works (Rahman 2020). Along similar lines, various countries have allocated resources and funding either to promote an alignment with SDGs or to strengthen the existing mechanisms that have evolved in the past few years.

However, challenges remain, particularly in the aftermath of the COVID-19 pandemic and the economic downturn that it generated. For example, in Rwanda, the percent of spending now necessary to achieve SDG goals, as contemplated before the pandemic started, has risen considerably, introducing fiscal stressors that now must be timely addressed (Lledo and Perrelli 2021). In a country like Burkina Faso, the capacity of the state to marshal necessary funds to adequately address developmental requirements have become challenging, requiring recalibration of the financial framework so that the country is effectively and efficiently able to attract and organize monetary resources from both public and private sources.

On a broader level, the SDG financing apparatuses have experienced fluctuations owing to global tailwinds, contracting, and unevenly being distributed owing to emergent conflicts and geopolitical connotations. Nevertheless, the uptick in SDG financing has been consistent, despite slowdowns and gaps that remain prevalent (OECD 2022a). Table 6 is an illustrative overview of aid financing that was committed to various countries, under the aegis of one or more of the SDGs. Specifically, the table provides estimates for Official Development Assistance (ODA) aligned with the SDGs between 2015 and 2017.

TABLE 6. Developmental finance across selected countries targeting identified SDGs (2015–2017+, in USD million).

Region	Countries	SDG 6: Clean water and sanitation	SDG 7: Affordable and clean energy	SDG 9: Industry innovation and infrastructure	SDG 11: Sustainable cities and communities	SDG 12: Responsible consumption and production
East Africa	Ethiopia	14.11	0.2	8.06	7.7	5.3
	Kenya	5.2	7	19.86	24.9	19.6
	Rwanda	0.79	8.3	26.1	1.04	6.7
North Africa	Egypt	0.05	0	2	1.3	0.9
West Africa	Burkina Faso	5.42	0	0.79	7.6	5.4
	Ghana	22.6	1.61	5.85	4	4.75
South America	Colombia	6.2	1.39	6.4	2.4	4.7
	Peru	5.3	1.7	7.7	4.2	25.8
South Asia	Bangladesh	14.15	0.014	11.45	20.6	1.87
	India	700	259	279	249	132
	Nepal	2.6	0.6	2.57	6.4	1.5
	Sri Lanka	0.2	0	0.78	2.1	0.9
Southeast Asia	Cambodia	4.3	0.056	0.43	1.06	3
	Philippines	5	0.87	2.2	4	0.97
	Vietnam	4.1	0.88	1.37	2.33	3.6

Source: SDGFunders.org based on OECD ODA data.

Measuring the fecal sludge (human waste) at Dikowita Bio Gas Unit, Western Province, Sri Lanka.
Photography by Hamish John Appleby / IWMI

4.4. Tax Incentives and Rebates

The type of incentives' framework that a country generally follows and promotes is determined by its own developmental ambitions and availability of resources. In terms of bolstering RRR, countries choose for a broader, more holistic incentives' framework, comprising rebates, lower commercial tax and/or extra surcharge/ levies that emphasize larger developmental aspects over concentrated specific interventions in CBE-related disciplines (Figure 12). However, as the RRR sector remains a developing mechanism, the accompanying policy and taxation apparatuses remain dynamic, open and prone to frequent recalibration. This, at times, makes the incentives unpredictable and occasionally introduces unexpected compliance burdens. For instance, the value-added tax (VAT) exemption granted by the Government of Kenya for green products was removed, before being reinstated in 2021 following considerable backlash and discontent from industry associations. Furthermore, incentives that are provided are often designed to be time-limited and/ or outcome-contingent; for example, the Government of Kenya's biogas digester subsidy was introduced in 2009 and subsequently withdrawn in 2013, having promoted over 11,000 installations. Finally, the success and coverage of any incentive framework is dependent upon the underlying efficiency and coordination among various administrative organs of the state – if they are lacking and/or without sufficient harmony, challenges become inevitable.

RRR-related incentives provided by selected countries

North Africa

Egypt

Feed tariff for renewable energy to increase private investment in renewable energy.

30% reduction from the net taxable profits for agricultural waste recycling industry and new renewable energy projects.

Investment law incentive of **10%** of the establishment's budget to support company's working on waste management sector.

Sales tax reduction from **10%** to **5%** and customs duties on equipment used for renewable energy production set at **2%.**

Source: IEA 2016

West Africa

Burkina Faso

The government **subsidizes the installation of biogas digesters** for households.

Source: Pilloni and Hamed 2021

Ghana

No Information on specific RRR-related incentives/ rebates.

South America

Colombia

Treatment and recycling of waste and wastewater are **exempted from VAT.**

Up to **50% reduction** of the income tax, based on the total value of investment acts as an incentive for energy recovery from solid waste.

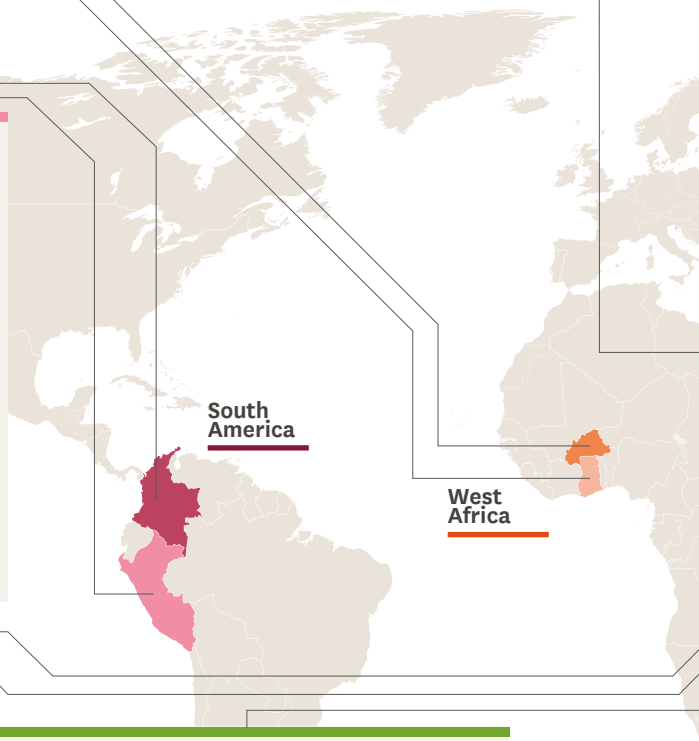
VAT and tariff exemptions and **accelerated depreciation of assets** (e.g. national or imported equipment, tools, machinery and services) for the production and use of energy from solid waste.

Source: Alzate-Arias et al. 2018

Peru

20% income tax reduction for generating electricity from renewable energy resources. Accelerated subsidization is applicable to machinery, equipment and building infrastructure required for the installation and operation of electricity plants generating power through renewable resources.

Source: KPMG International 2014



East Africa

Ethiopia

Income tax exemption of up to 6 years for manufacturing and agro-processing, and up to 9 years for agricultural investment.

There are no sustainability incentives or environmental taxes in effect currently and the carbon tax under consideration relates to the transport sector in Addis Ababa only.[3]

Source: Ethiopian Embassy 2018

Rwanda

Within agriculture, all inputs can be imported duty-free, **50% government subsidy** for biogas technologies.

Source: MININFRA 2015

Kenya

The **National Policy Framework** on Green Fiscal Incentives.

Carbon-neutral trade (**15% tax instead of 30%**).

Provision of incentives for locally produced and imported waste collection machines, equipment for recycling, composting, transporting and waste compacting.

VAT exemption on renewable energy products including *inter alia* biogas digesters, biogas and biomass briquettes.

Source: FAO 2022; GOGLA 2021

FIGURE 12. Overview of RRR-related incentives provided by selected countries. [2]

[2] The figure *endeavors* to provide a broad assessment of the prevailing landscape rather than an exhaustive one, as the circular economic policies across countries remain in various stages of development.

[3] https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/tax/tax-pdfs/ey-green-tax-tracker-30-june-2023.pdf (accessed on March 6, 2024).

South Asia

Nepal

Equipment and materials for renewable energy – **exemption from custom duty and VAT**.

Production of bioenergy will be eligible for a **100% corporate tax exemption** for the first 10 years.

40% subsidy for small firms using renewable energy sources.

A **subsidy** is granted to any producer who constructs a vermicomposting bin on farm.

Provision of a **minimum subsidy of 40%** to set up fecal sludge treatment facilities.

Source: Dhakal and Escalante 2022; GGGI 2021

Bangladesh

Waste treatment plants are **eligible for tax exemption**. The period of exemption is 10 years, with Year 1 providing **90%** exemption and each subsequent year till Year 10 reducing the exemption amount by **10%**.

15% VAT exemption for renewable energy equipment and raw materials. Corporate income tax exemption for a period of 5 years for renewable energy project investors.

Source: MPEMR 2008

India

Financial assistance for setting up biogas plants.

Incentives provided for wastewater treatment plant.

Up to **40% subsidization** in the first year and **20%** in subsequent years on investments made in renewable energy projects,

Financial subsidies of up to **50%** of the capital costs to set up pilot demonstration plants on municipal solid waste composting.

15% rebate on property tax for housing societies for segregation and treatment of wastewater on premises and for using recycled grey water.

50% subsidy on project capital cost for effluent treatment plants.

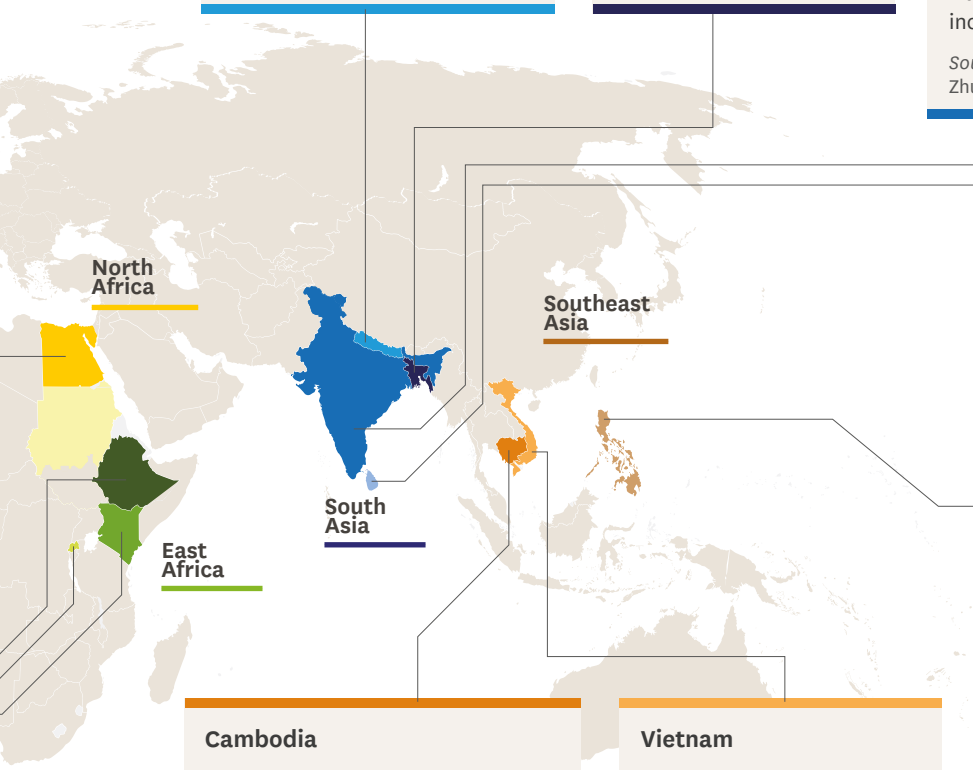
Deduction of 100% of the expenditure on wastewater treatment plants from their taxable income.

Source: MMT 2023; Times of India 2019; Kaur et al. 2012; Zhu et al. 2008

Sri Lanka

7-year **tax holiday** for renewable energy projects.

Source: BDO Global 2021



Southeast Asia

Cambodia

Tax breaks for Qualified Investment Projects (QIPs).

Exemption from certain import and export duties for QIPs.

Provision of incentives to SMEs related to the waste recycling sector.

Imports of equipment, infrastructure materials and machinery for industrial operations in special economic zones with wastewater treatment plants are **exempt from import duties and other taxes**.

Source: AC 2024; GIZ 2020

Vietnam

10% tax incentive for companies investing in eco-friendly and renewable energy projects for 15 years.

4-year **tax exemption** and **50% tax reduction** for 9 consecutive years for renewable, clean energy, waste to energy projects.

Exemption or reduction in business income tax for wastewater reuse technologies.

Source: APEC 2020; World Bank 2014a

Philippines

Green and recycling industries can benefit from a 5–7-year **income tax holiday**.

The Green Jobs Act provides for a special **deduction from taxable income** equal to **50%**.

Imports of capital equipment are also **tax- and duty-free**.

7-year **income tax holiday and tax exemptions** for carbon credits.

7-year **income tax holiday** for renewable energy developers and a guarantee of origin for the renewable energy market.

A **corporate tax rate of 10%** (reduced from the regular **30%**) on net taxable income shall be imposed on all renewable energy developers after 7 years of income tax holiday.

Source: ADB 2020; KPMG International 2014

4.5. Prevalence of Corruption and Corrupt Practices

Corruption remains a global challenge. It is estimated that over USD 3.6 trillion is lost annually owing to corruption in the form of bribes and stolen money (WEF 2018). In developing regions, difficulty of opportunities, severe inequalities and underdeveloped enforcement mechanisms generate multifarious levels of corruption and corrupt practices. However, the situation is not uniform and even within problematic regions, certain countries maintain much greater levels of curbs over corrupt practices and, consequently, have lower levels of overt corruption. Therefore, ascertaining the effective prevalence of corruption remains extremely challenging, given its different forms and the furtiveness of the act itself. Nevertheless, a tripartite approach of utilizing World Bank Enterprise Surveys (Figures 13 and 14) as well as Transparency International (Figure 15) analyses provides key insights within the selected countries.

Under the World Enterprise Surveys (Figure 13), corruption was viewed as a major constraint in Burkina Faso (70.4%) followed by Colombia (62.1%). However, the inconsistency in the reporting years among countries should be noted as responses from Burkina Faso came from 2009 while responses from Bangladesh were collected in 2022.

Bribery incidence (Figure 14) measures the percentage of companies that have been asked to pay a bribe in at least one of six public transactions related to utilities access, permits, licenses and taxes. If a company declines to answer a particular survey question, it is counted as a positive response for the purpose of calculation. According to the World Bank Enterprise Surveys (2023b), increased bribery incidence was seen in both small- and medium-size firms in Cambodia, India and Vietnam (Figure 14), while Egypt and Rwanda showed the lowest bribery incidence.

Under Transparency International's CPI, Rwanda remains one of the better performing countries within its region and is perceived to have much lower levels of corruption compared to its peers with a rank of 54 (out of 180) and the highest score among its peers at 51 (Figure 15). Cambodia is ranked at 147 with a score of 24 so it remains the worst compared to its peers and one of the worst, globally, in the corruption ranking indices.

The World Bank's political stability score measures the stability of a nation's government and the political environment. This is an aggregate indicator which gives scores for countries from -2.5 to +2.5 based on the political stability and absence of politically driven violence or terrorism. The political stability score for the different countries is shown in Figure 16. Strong political stability in a country provides a conducive environment and sense of security for long-term business operations and has a positive impact on the business sector. Nepal (-0.2), Vietnam (-0.1), Cambodia (-0.1), Ghana (0.1) and Peru (-0.4) have obtained higher scores for political stability compared to their regional peers, while Rwanda (0.2) leads among all the selected countries of the different regions (Figure 16). According to the World Bank (2021a), Ethiopia (-2.1) and Burkina Faso (-1.6) have weak political stability in comparison with the selected countries of other regions which is reflected in their lowest scores.

It is estimated that over **USD 3.6 trillion is lost annually** owing to corruption in the form of bribes and stolen money

Rwanda (East Africa) remains one of the better performing countries within its region and is perceived to have much lower levels of corruption compared to its peers with a rank of 54 (out of 180) and the highest score among its peers at 51

Cambodia (Southeast Asia) is ranked at 147 with a score of 24 so it remains the worst compared to its peers and one of the worst, globally, in the corruption ranking indices.

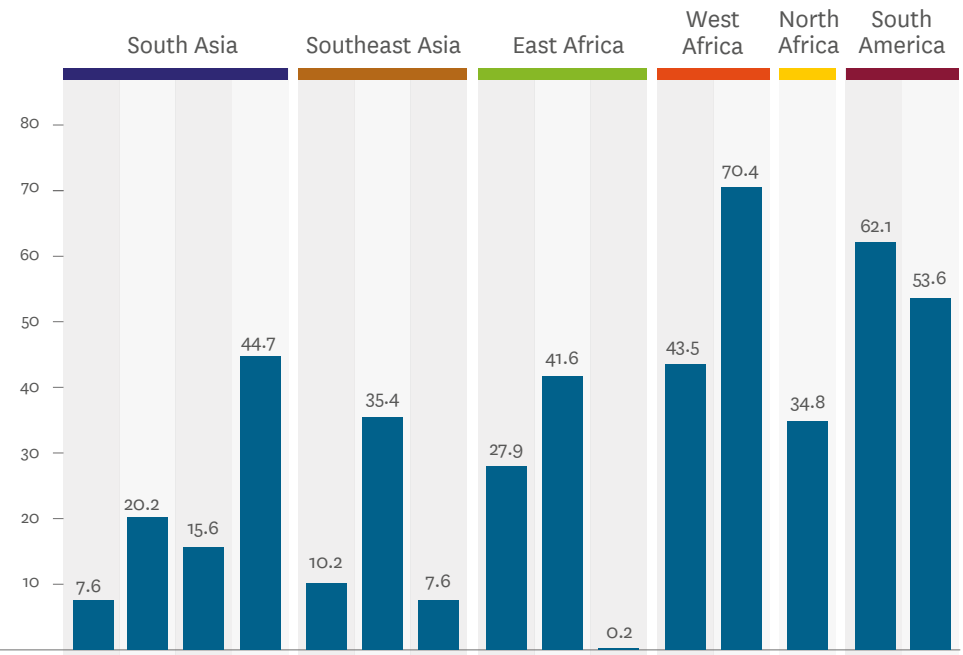


FIGURE 13. Percentage of firms identifying corruption as a major constraint (in %) across selected regions.

Source: World Bank Enterprise Surveys 2023a.

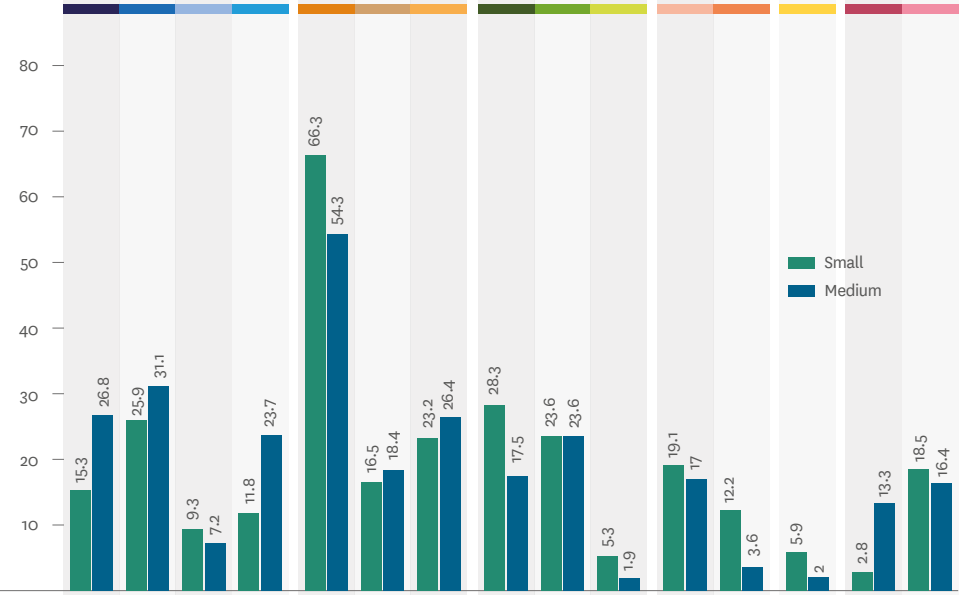


FIGURE 14. Bribery incidences observed in the selected countries.

Source: World Bank Enterprise Surveys 2023b.

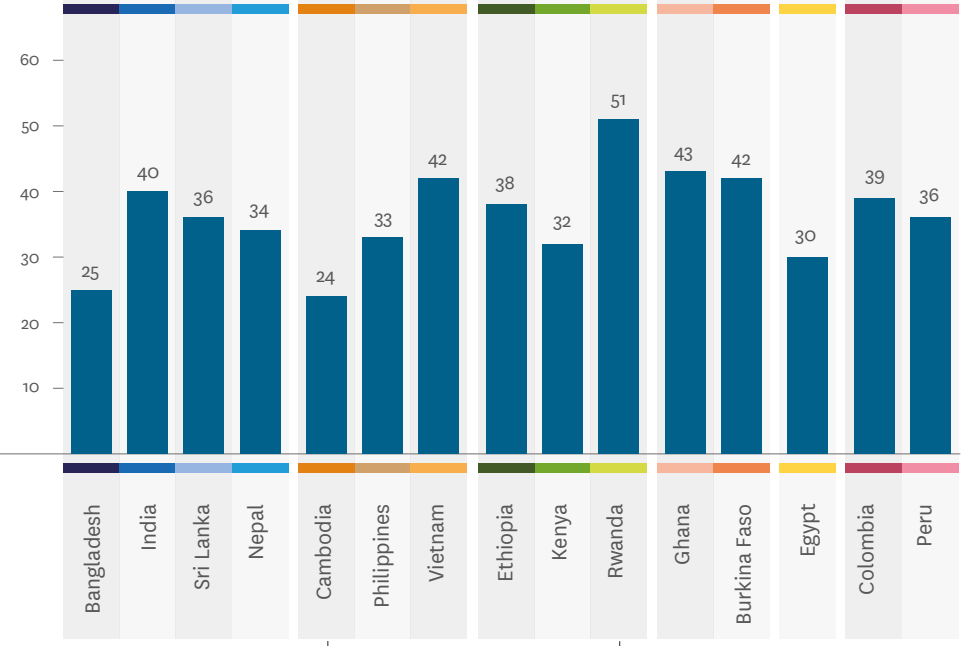


FIGURE 15. Corruption perception index score 2022.

Source: Transparency International 2022.

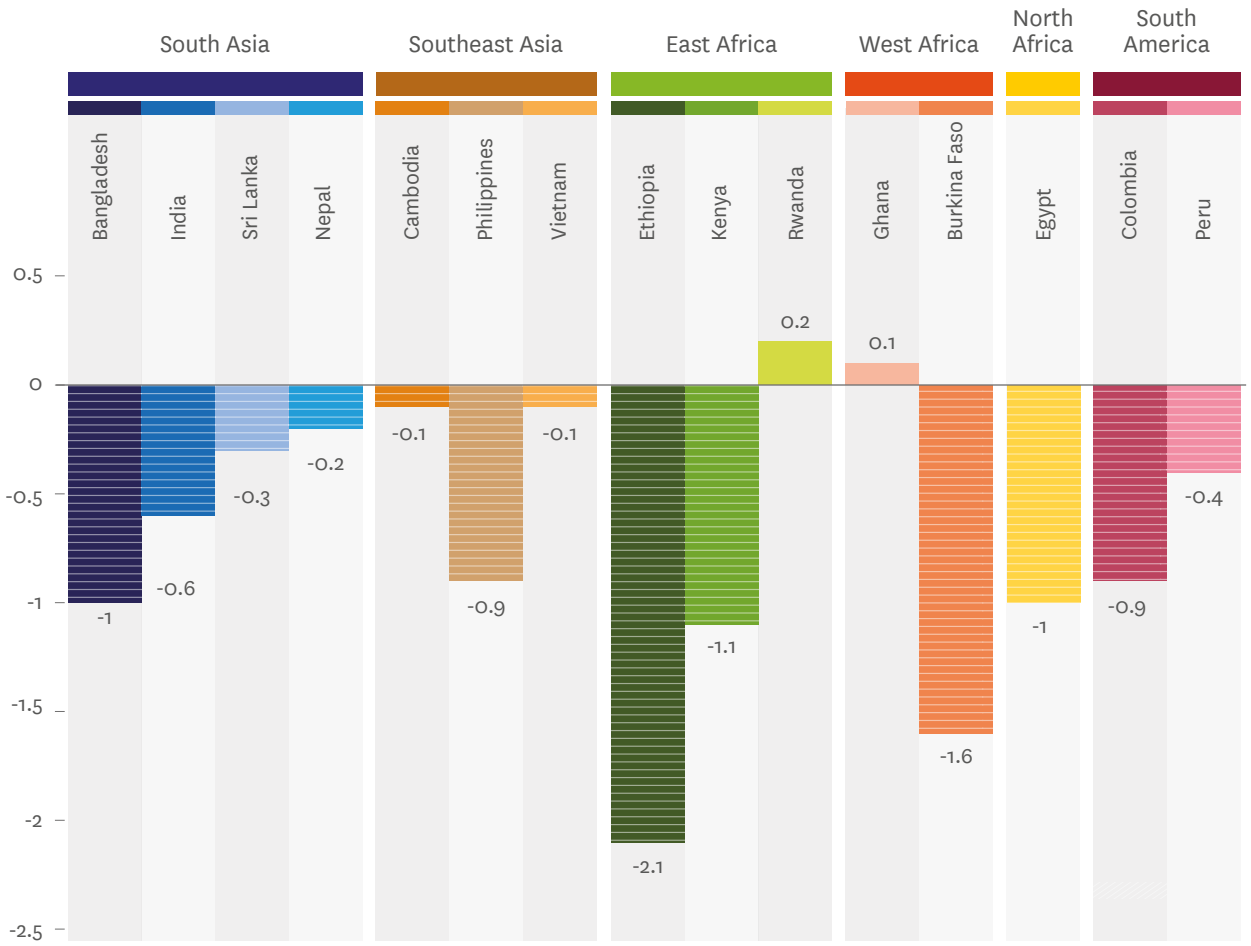


FIGURE 16. Comparative political stability score of different countries.

Source: World Bank 2021a.

4.6. Levels of Satisfaction and Associated Challenges

The assessment of satisfaction in terms of public service delivery and availability of infrastructure, both physical and regulatory, across countries and regions, remains difficult, owing to unique developmental requirements, regional priorities as well as the availability of information across the regions. The Worldwide Governance Indicators (WGI) of the World Bank synthesize and present a regional and country-wise assessment of the performance of countries across the parameters of corruption, rule of law and so forth. According to World Bank (2022a), East Asia and Pacific had the best performance across the selected regions (Figure 17).

An additional overview (Figure 18) can be gained through The Chandler Good Government Index (CGGI 2022), which assesses countries across seven different parameters and assigns an overall rank to establish how well governmental institutions function across countries.

Apart from international-level assessments, certain governments conduct and assess perceptive performance and satisfaction levels themselves, in addition to private associations; notably, the governments of Kenya, the Philippines, Rwanda and Vietnam conduct surveys to ascertain prevailing levels of satisfaction. Rwanda conducts the most thorough evaluation with the Rwanda Governance Scorecard, an assessment which combines different perception and assessment surveys to establish governance performance on a yearly basis. However, the different methods of evaluation utilized do not make it permissible to arrive at a harmonized assessment (Box 1).

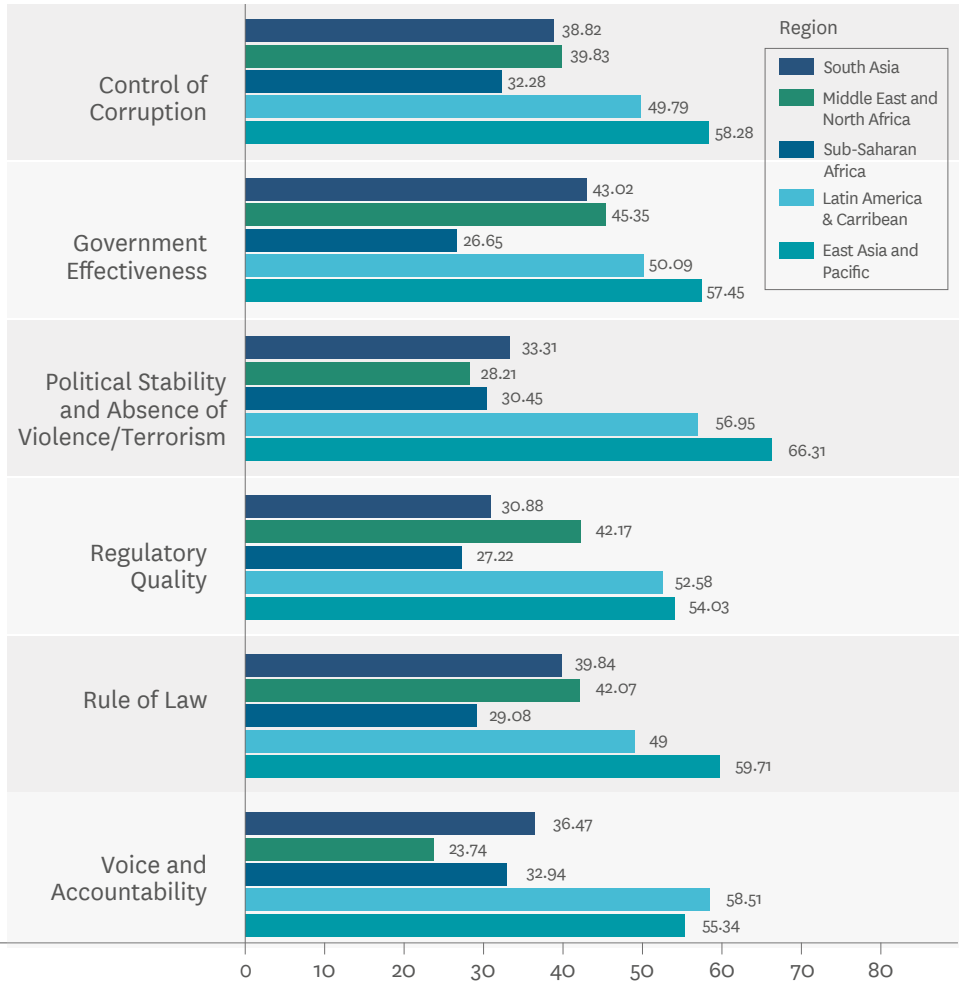


FIGURE 17. Regional performance in WGI (percentile rank)

Source: World Bank 2022a.

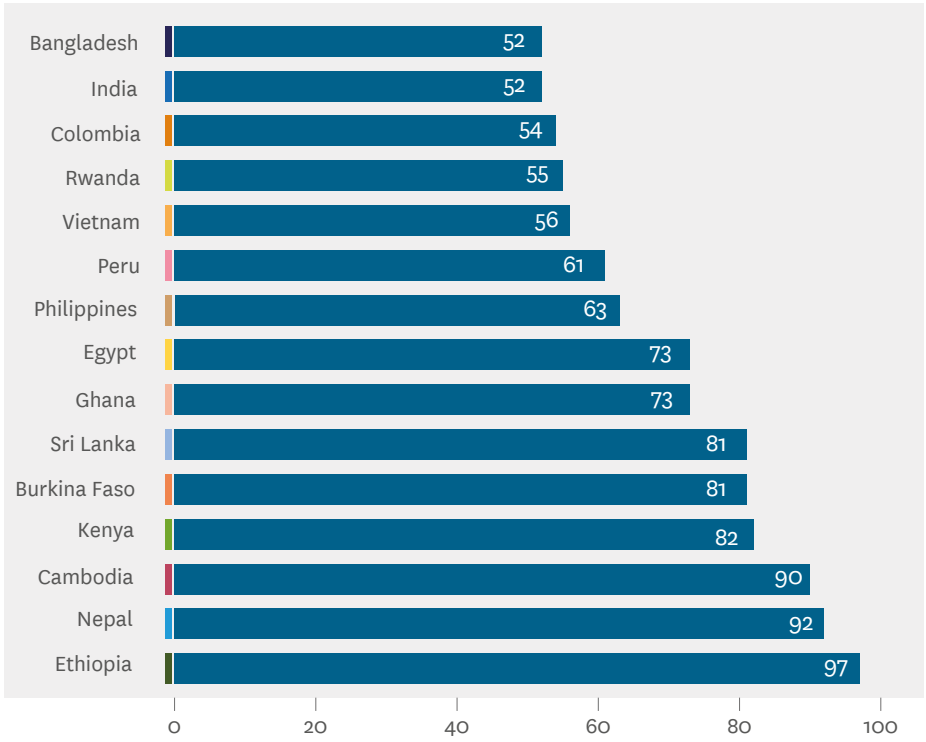


FIGURE 18. Performance (rank) of selected countries on the CGGI 2022.

Source: CGGI 2022.

BOX 1. Government-conducted perspective performances and satisfaction levels in selected countries

Kenya

The Kenya Revenue Authority (KRA) periodically conducts customer satisfaction surveys to ascertain the sentiments of different stakeholders (small, medium and large taxpayers) using its platform. For the period 2019–2020, the overall customer satisfaction was 68.4%, as compared to 71.9% in 2017 and 65% in 2013–2014 (KRA 2020).

The primary drivers for dissatisfaction among the MSMEs were access to formal credit, easy access to utilities, lower crime rates and perceptions about the integrity of legal and governance institutions. Consequently, if improvements are made in one or more of these aspects, they act as motivators for companies to expand and grow (Shibia and Barako 2017). Kenya's aggressive tax policies and convoluted filing processes have repeatedly been stated by businesses to be one of the most significant constraints in operating commercial enterprises. The Kenyan Tax System promotes 'alternative dispute resolution'; however, the process has not reduced adversarial litigation, defeating the original intent (Kanyi 2019). Furthermore, the aggressive collection policies invariably result in ever-changing tax rules and regulations introducing compliance burdens and much higher risks of penalties.

The Philippines

The Development Academy of the Philippines through its Government Quality Management Program conducts a nationwide business satisfaction e-survey (e-BizSat); in the 2021 edition, businesses gave frontline government service an overall satisfaction score of 82.58 (DAP 2022).

Rwanda

The Government of Rwanda carries out multiple perception and satisfaction surveys across different bodies, in addition to those carried out by private actors.

In 2018, the Rwanda Revenue Authority satisfaction survey found that 76% of customers were satisfied with the last interaction, with 79% being satisfied with the duration it took to resolve their queries (RRA 2018). Similarly, the Rwanda Public Procurement Authority conducted one for UMUCYO – the e-procurement platform, finding that overall satisfaction with the platform stood at 79.5%, with 'reducing corruption loopholes' faring much lower with just 52.2% of users being satisfied with it (MINECOFIN 2022).

In addition to other government entities intermittently conducting user satisfaction surveys, the Rwanda Governance Board (RGB) periodically publishes the Rwanda Governance Scorecard (RGS), a holistic index which evaluates the state of governance utilizing secondary sources as well as surveys conducted by the RGB itself, which are cumulatively scored across eight pillars that include the Citizen Report Card, the Service Delivery Monitoring Report and others.

In the 9th Edition of the RGS released in 2022, Pillar 7 – Quality of Service Delivery, scored 77.69 out of 100, with subindicators and their scores being: Service Delivery in Social Transformation (79.78), Economic

Transformation (68.84), Quality of Service Delivery in Public, Private & Civil Society (77.48) and Service Delivery through ICT (73.79). Under Indicator 4 – Climate Change & Environmental Resilience within Pillar 5, the score was 71.67 out of 100 (RGB 2022).

Additionally, according to the Business Investment Climate Survey conducted by the Private Sector Federation – the leading private industry association in Rwanda – businesses were most dissatisfied with tax rates (78.4%), followed by local business competition (68.7%), low local demand for products and services (65.7%), tax administration (58.9%) and access and costs associated with borrowing money (58.2%). The surveyed businesses cited these aspects as the most formidable challenges they faced while operating in Rwanda (PSF 2019).

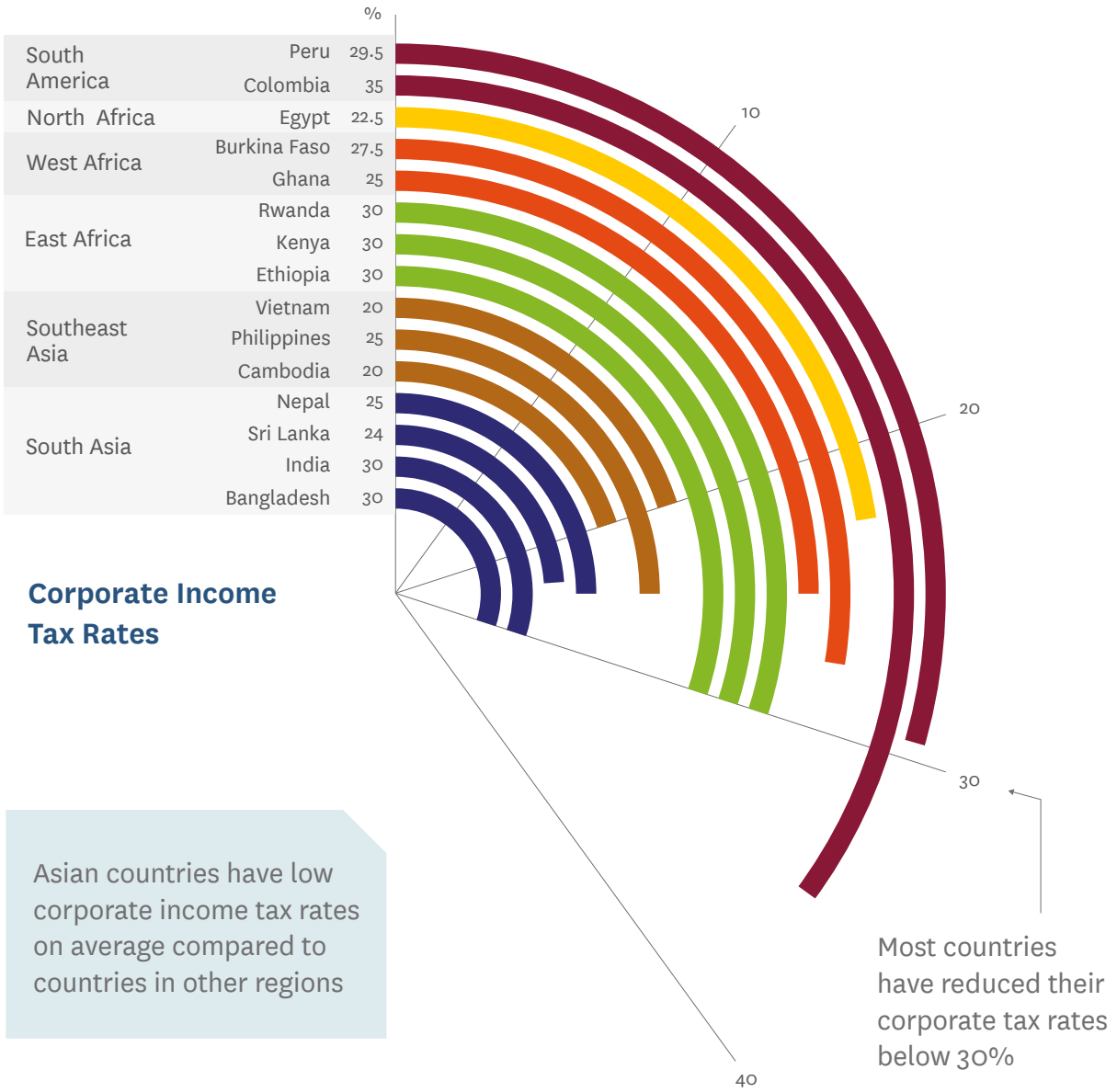
Vietnam

Since 2018, the Government of Vietnam has been utilizing the Satisfaction Index of Public Administrative Services (SIPAS) to measure people's satisfaction with administrative services. SIPAS contains indicators such as public and organizations' perceptions, satisfaction levels and expectations to assess the performance of the Vietnamese government (Chien and Thanh 2022). Under SIPAS, the public administrative service satisfaction index of 63 provinces is in the range of 83% to 94%; localities with a high satisfaction index (90% or more) number the cities of Quang Ninh, Hai Phong, Hung Yen, Hai Duong, Ha Tinh, Son La, Bac Ninh and Bac Giang (VOV World 2022).

4.7. Infrastructural Gaps and Effects on Business Satisfaction

Cumulatively, gaps remain across developing regions in terms of governance infrastructure as well as efficient public service delivery. The larger challenges businesses face within these regions and countries often are similarly tuned with varying levels of concentration; the processes and laws often are complex, bureaucratic and present compliance burdens. Additionally, injudicious fiscal management leads to higher taxes and levies, compressing commercial prospects and limiting market penetration. Furthermore, burden of taxation is often not just in the quantum levied, but also the associated reporting and compliance processes.

In the past few decades, countries have become aware of the impact of high corporate tax rates on business investment decisions. Therefore, most countries have reduced their corporate tax rates to below 30%. According to the Tax Foundation (2022), Asian countries have low corporate income tax rates on average compared to countries of other regions. Among the selected countries, Cambodia (20%), Vietnam (20%) and Egypt (22.5%) are leading with low corporate income tax percentages (Figure 19). However, the Philippines, Sri Lanka and Burkina Faso have shown a decline in their corporate tax rates from 2020 to 2022 by 5 percentage points (ppt), 4 ppt and 0.5 ppt, respectively (Tax Foundation 2022).



Lowest corporate income tax percentage in the selected countries

Cambodia (Southeast Asia)	**20%**
Vietnam (Southeast Asia)	**20%**
Egypt (North Africa)	**22.5%**

Countries that show a decline in their corporate tax rates from 2020 to 2022

Philippines (Southeast Asia)	5 ppt*
Sri Lanka (South Asia)	4 ppt
Burkina Faso (West Africa)	0.5 ppt

Note:
* ppt- percentage point

FIGURE 19. Corporate income tax rates across selected countries in 2022 (%).

Source: Tax Foundation 2022.

A river being used for multiple uses, Bobo, Burkina Faso.
Photography by Manon Koningstein / IWMI

Furthermore, as developing countries struggle to allocate sufficient resources to learning and education, lack of skilled labor becomes an active hindrance such as in Burkina Faso where education quality and coverage remain extremely poor. Additionally, even in countries that otherwise present more palatable business climates, inadequacy of a high-quality labor pool compels reliance on foreign workers and expatriates such as in Kenya and Rwanda.

4.8. Conclusion

Summing up the governance climate, it can be said that in terms of development, each of the 15 countries is managing to attain sustainability. With respect to infrastructure, all the countries have positive investment trust, specifically in the area of energy, which is an essential component of the RRR ecosystem. Southeast Asia as a region constitutes highly effective governance in terms of public service delivery and regulatory quality. Countries such as Cambodia and Vietnam are taking the lead in control of corruption with high political stability and low corporate tax rates which can create a favorable ecosystem for business development. East African countries, Rwanda in particular, have adequate infrastructure developments such as access to electricity and water along with efficient control of corruption and bribery. Colombia and Peru have also shown better regulation of corruption and bribery, and efficient connection with international markets to promote development of the RRR sector. Based on the analysis, more than 10 out of 15 countries have specific incentives and tax redemptions and rebates with respect to RRR initiatives, whether domestic or commercial. Comparatively, India has committed higher financial aid in terms of ODA specifically targeting the SDG goals to promote sustainable development and welfare.

5

ACCESS TO FINANCE: SOURCES, FINANCIAL INCLUSION AND DONOR FUNDING

This section is dedicated to studying the financial aspects of circular economy businesses. It not only assesses sources of capital, but also the financial strengths of each country studied. For instance, the amount of foreign direct investment (FDI) across the regions remains substantive, with the 15 selected countries receiving over USD 100 billion in 2021. South Asia remains popular with investors, with India receiving the largest share of FDI at USD 44.7 billion, followed by Vietnam (USD 15.7 billion) and the Philippines (USD 10.5 billion) (Figure 20). It is noteworthy that FDI flows for African countries are lower than 5% and in case of Latin American countries FDI is lower than 10%.

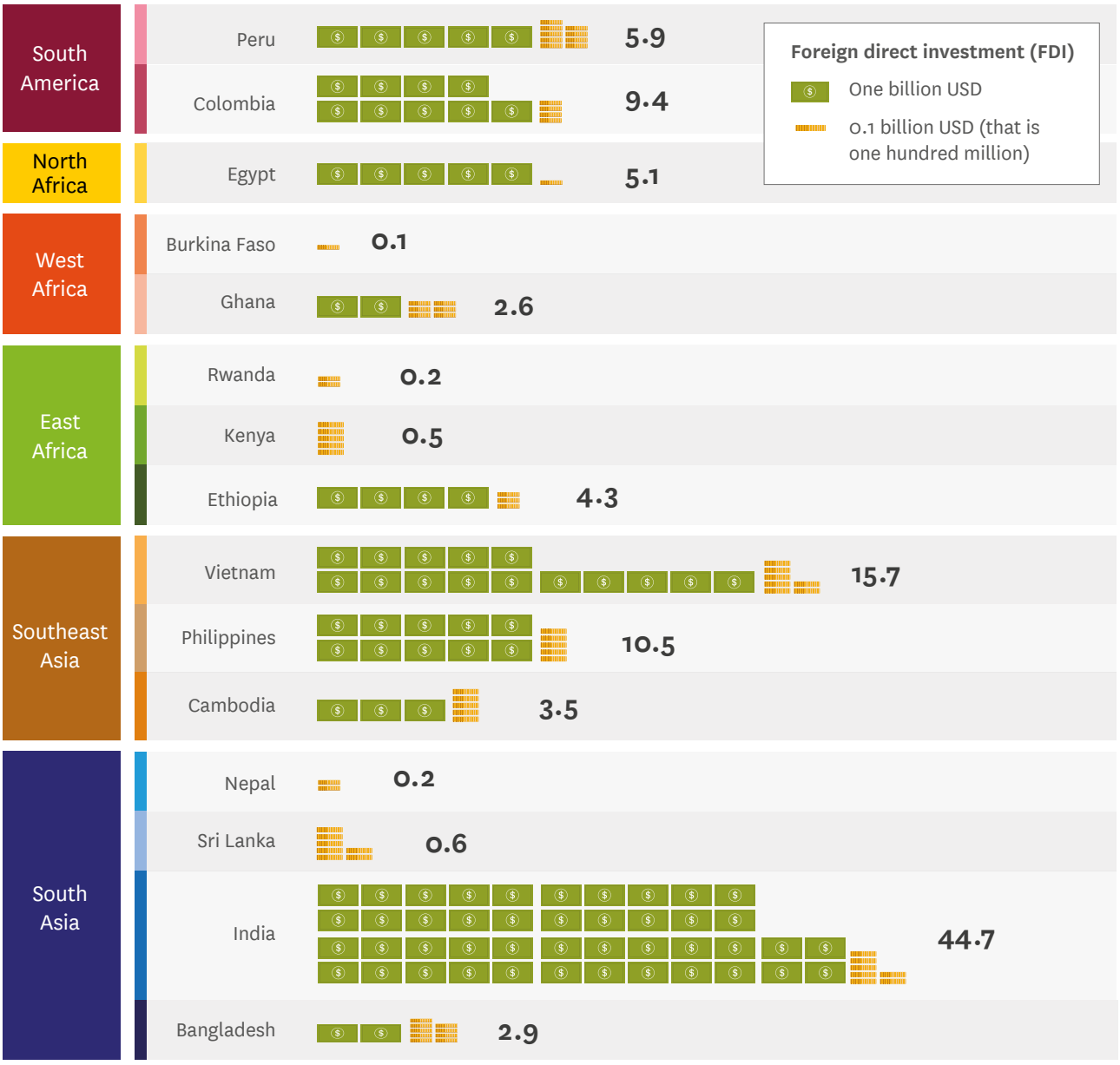


FIGURE 20. FDI inflows (in billion USD) across selected regions.

Source: UNCTAD 2022.

Wastewater treatment plant in Sakha village in Kafr El Sheikh governorate, Egypt.
Photography by Gihan Bayoumi / IWMI

5.1. Inclusion and Sources

The selected countries have a lower rate of borrowing from formal institutions (Figure 21), with only one country Cambodia (30.9%) is above the 25% ceiling. African countries particularly have a lower borrowing rate from formal institutions except for Kenya (22.2%). In Latin America, both Peru (21.9%) and Colombia (18%) have higher rates of borrowing from financial institutions. In South Asia, Sri Lanka reported higher borrowing from formal institutions, which in other countries is reported to be lower than 15%. By and large, family and friends remain the top preference for borrowing in all countries.

World Bank (2022b) reports that 54.4% of people in Kenya use this resource, followed by Nepal (41.8%) and the Philippines (40.8%). In terms of financial account holding (Figure 22), Sri Lanka has nearly 89.3% of individuals with a financial institution account followed by Kenya (79.2%) and India (77.5%). Account holding with financial institutions is higher in South Asia and Latin America with more than 50% of the population holding accounts. The data on formal borrowing and account holding in financial institutions indicates a low correlation except for Sri Lanka.

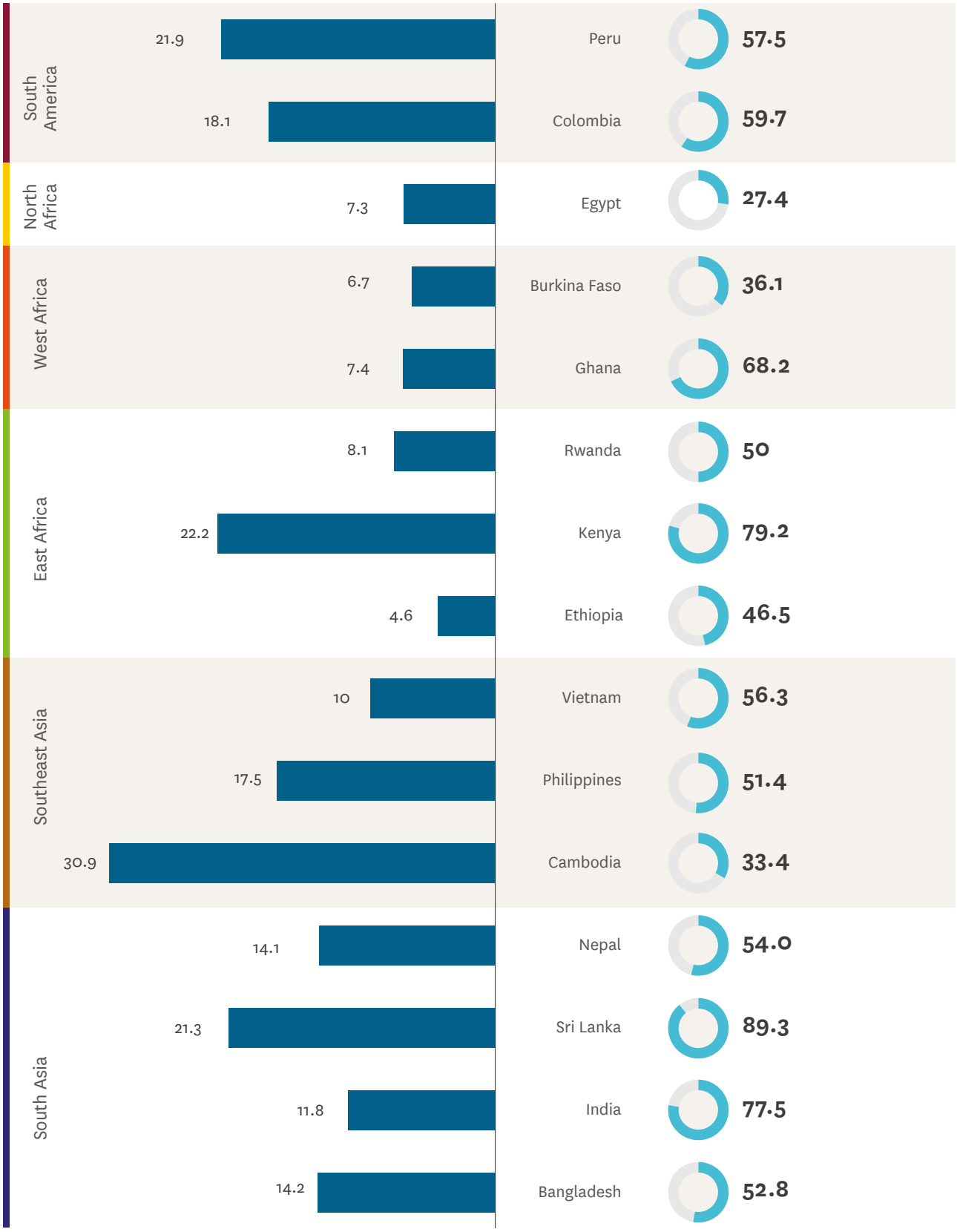


FIGURE 21. Financial inclusion: Borrowed from a formal financial institution (% age 15+).

FIGURE 22. Financial inclusion: Financial institution account (% age 15+).

Source: World Bank 2022b.
Notes: Data for Vietnam and Ethiopia were from 2022, Rwanda 2017 and other countries 2021.

5.2. Lending Interest Rates

The ability of an individual and/or a business to procure affordable and accessible credit remains a critical factor for enabling a healthier commercial environment and bolstering business growth. Across most of the selected countries, accessing credit remains an expensive enterprise, with high interest rates and varying collateral requirements. Figure 23 provides an overview of lending interest rates and posits the lowest applicable values that can be opted for while borrowing. Ghana remains by far the most expensive country for lending, with a 22% interest rate, followed by Rwanda (16.4%). While Latin American countries exhibit an interest rate between 12-16%, interest rates in Southeast Asia are lower (7-11%). However, the inconsistency in the reporting years between countries should be noted. In Figure 23, data for Nepal and Cambodia were from 2022 while data for Ethiopia were from 2008.

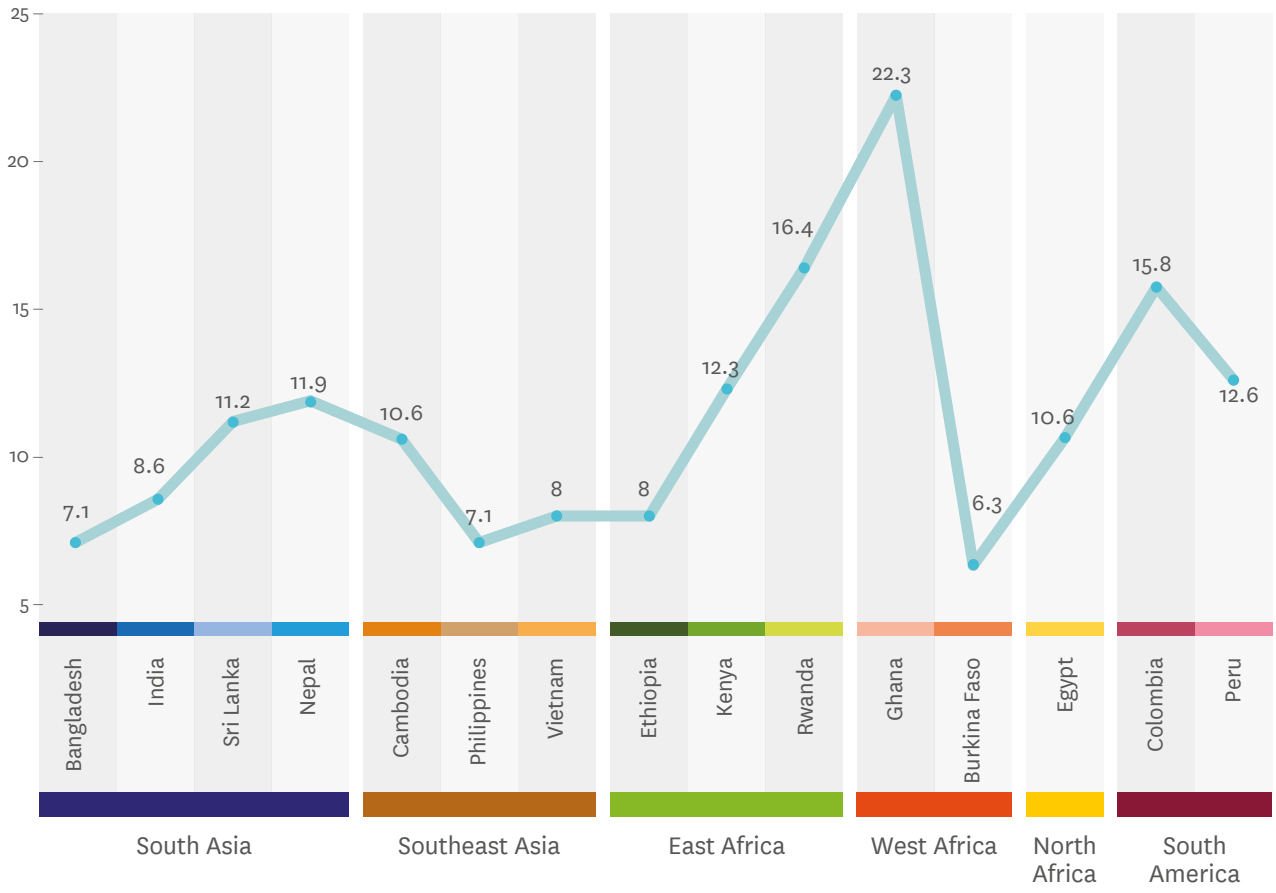


FIGURE 23. Lending interest rates across selected countries (in %).

Sources: World Bank 2022c; Loans in Ghana 2022; CEIC 2023a and CEIC 2023b.

Some of the notable variability in lending frameworks across different countries is now described. In Bangladesh, all small business owners pay an interest rate that is equal to the bank rate (currently 3%) + 4%, which results in a 7% interest rate. On average, MSMEs pay 14.4% and 31.22% for institutional and noninstitutional credit, respectively (Ali and Islam 2018). The lending interest in Cambodia varies depending upon the currency, with the US dollar at 11% and the KHR at 15% (UNESCAP 2022). The average interest rate for micro enterprises and MSMEs in Colombia is 17.15% and 13.64% respectively, as compared to 5.2% for large firms (OECD 2022b).

5.3. Donor Grants and Associated Dependencies

The studied countries, owing to their developing nature, remain significantly dependent upon foreign aid to carry out developmental activities and promote growth. However, the reliance upon Official Development Assistance (ODA) to execute central/federal government-funded projects differs across countries, creating varying levels of dependencies across different economies; it also highlights economic vulnerabilities if foreign aid and/or assistance is not forthcoming. Among the studied countries, the governments of Rwanda (74.2%), Ethiopia (58.5%) and Burkina Faso (56.8%) remain the most dependent upon foreign aid to carry out projects, whereas the governments of India, Peru, Colombia, the Philippines, Egypt and Sri Lanka have the least amount of dependency (less than 2.5% of total government expenditure) on foreign aid for central government expenditure (Figure 24).

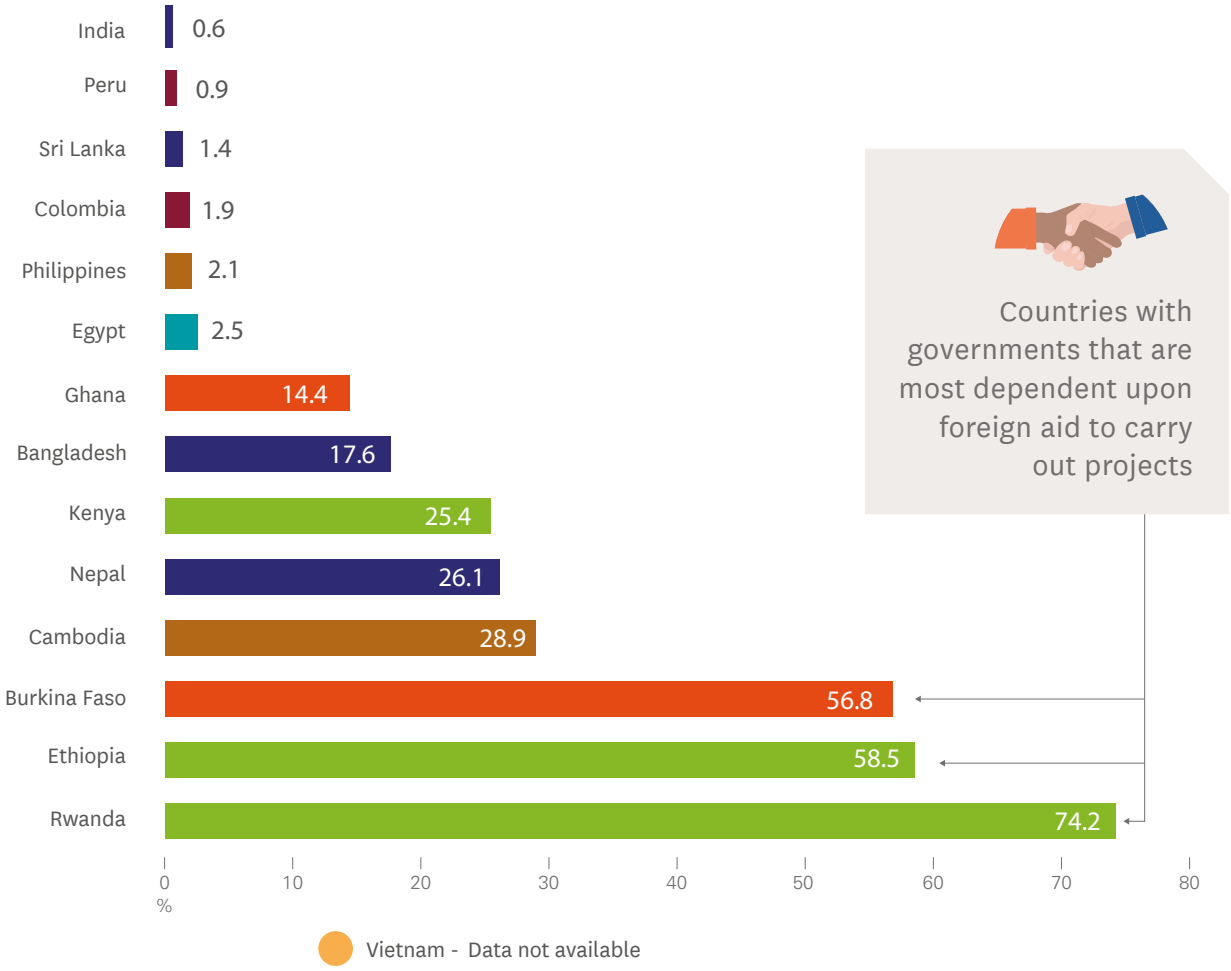


FIGURE 24. Official Development Assistance (received as a percentage of central government expenditure (in %)).

Source: World Bank 2021b.
Note: Data for Vietnam were not available.

The data from Aid-Atlas provides greater insights and the specific sectoral focus of these funding patterns across selected countries, showing the intersection of domestic development priorities with foreign developmental assistance (Table 7). For example, although India receives less than 1% government spending as assistance, the donor funding across sectors is quite substantial and more than other countries in comparison.

Notably, energy remains a key focus area in India (USD 1.758 billion), Bangladesh (USD 1.098 billion) and Egypt (USD 932.346 million). Agriculture and allied sectors attract donor funding most prominently in Kenya (USD 724.81 million), followed by the Philippines (USD 682.07 million) and India (USD 647.28 million). Donor assistance for water and sanitation is significantly higher in India followed by Vietnam, Egypt and Bangladesh.

TABLE 7. Donor funding disbursed across identified sectors in selected countries in 2020 (in USD millions).

Region	Countries	Agriculture, forestry and fishing	Energy	General environmental protection	Water supply and sanitation
East Africa	Ethiopia	476.36	315.18	83.85	159.37
	Kenya	724.81	352.37	84.72	276.75
	Rwanda	167.83	250.55	9.72	45.36
North Africa	Egypt	178.32	932.46	56.00	527.80
West Africa	Burkina Faso	187.97	58.18	10.23	92.01
	Ghana	239.99	180.53	10.64	77.83
South America	Colombia	287.16	65.24	215.08	81.32
	Peru	247.37	40.82	65.54	50.47
South Asia	Bangladesh	304.94	1,098.59	40.91	301.00
	India	647.28	1,758.27	90.41	990.74
	Nepal	75.43	237.89	30.47	107.11
	Sri Lanka	47.38	195.77	13.34	184.44
Southeast Asia	Cambodia	129.64	108.71	25.75	156.63
	Philippines	682.07	15.31	28.04	60.51
	Vietnam	211.37	458.25	57.32	446.55

Source: Aid Atlas 2020.

5.4. Foundations and Activities Related to Circularity

The greater uptake and acceptance of circularity and incorporating, promoting and otherwise supporting such initiatives remains a developing phenomenon. Across regions, circularity has gained greater momentum in parts of Africa, following the establishment of the Acen Foundation, jointly founded by the Africa Circular Economy Network (ACEN) and Trinomics – a green consultancy, to promote circular activities. Across countries, the engagements in the form of technical support and/or financial assistance vary, with certain institutions and entities participating and figuring more prominently within the spectrum in comparison with others. Prominent examples of foundations engaging within selected countries are shown in Figure 25 and discussed in Box 2.

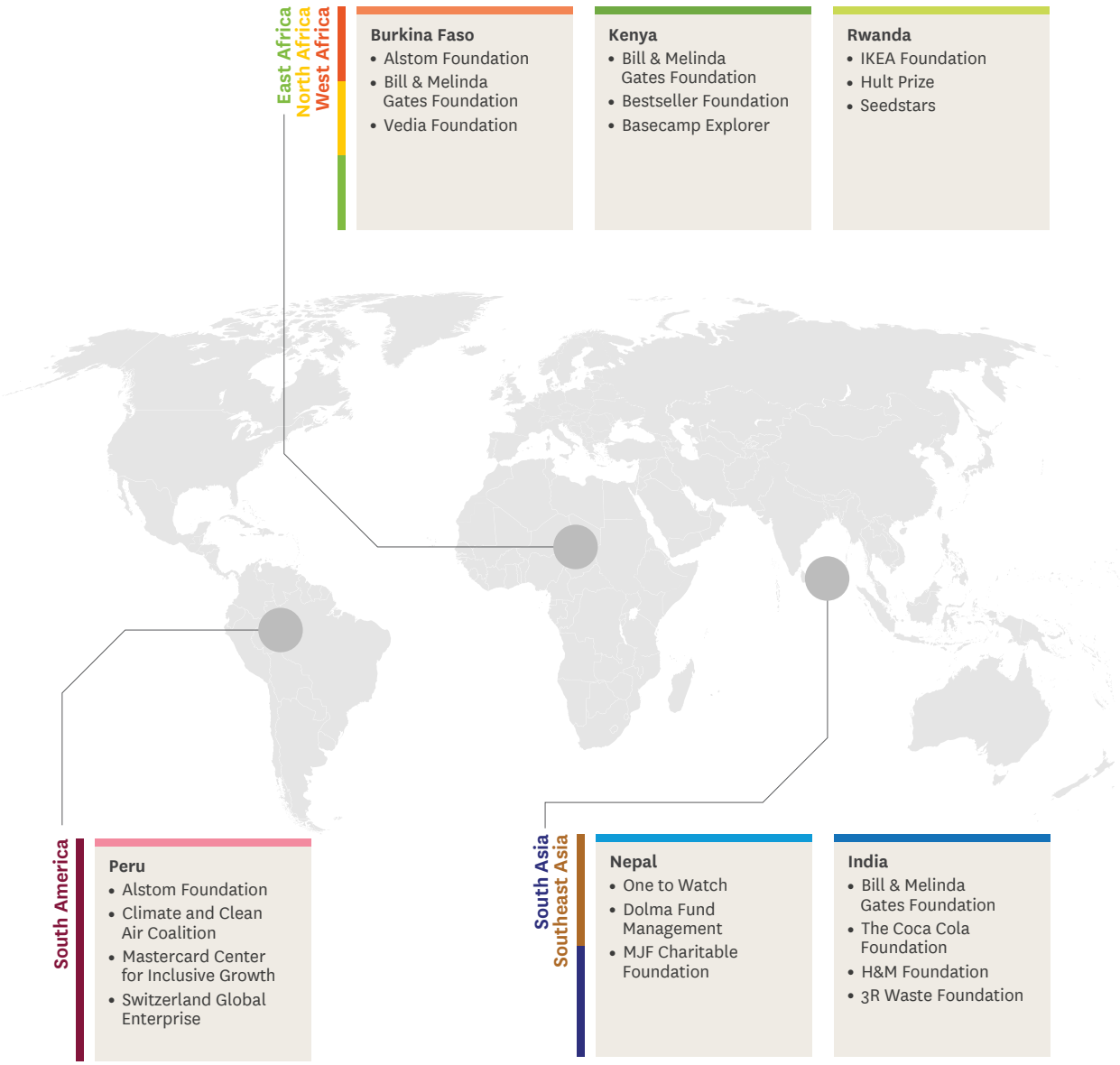


FIGURE 25. Access to finance: Foundations and activities across countries.

Source: Authors.

BOX 2. Examples of foundations engaged in circularity among various countries in the study.

Burkina Faso

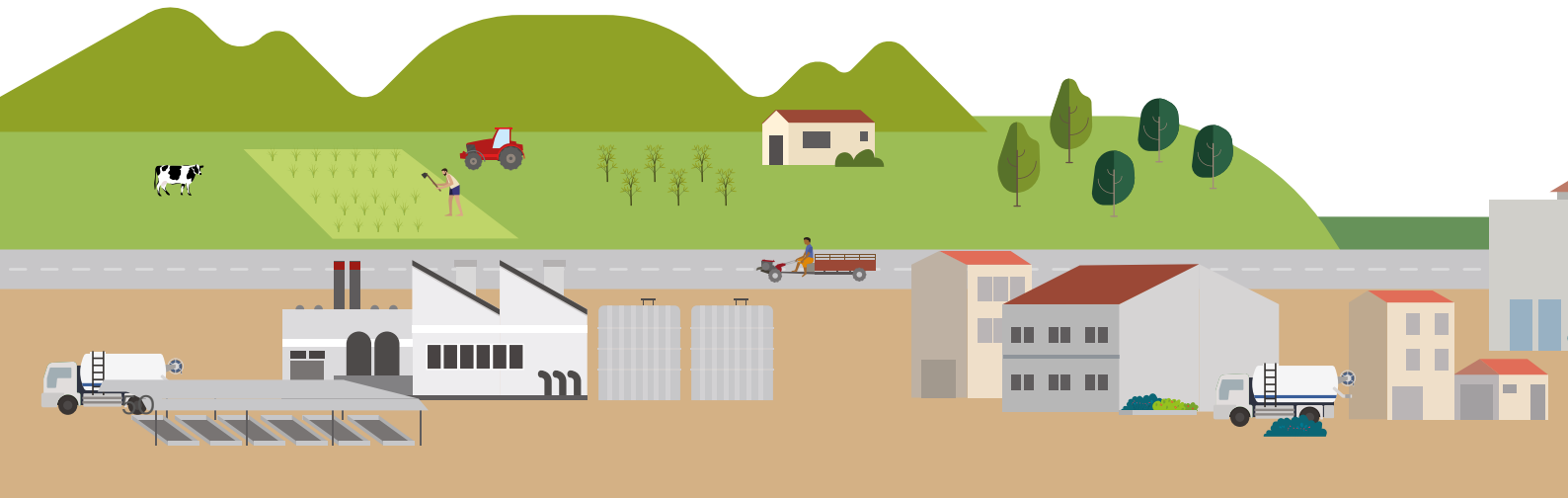
Foundational support to circular bioeconomy initiatives within the country remains in a developing state, apart from larger donors like the Bill & Melinda Gates Foundation, the Ellen MacArthur Foundation and the Alstom Foundation, other stakeholders have engaged in both financial and technical assistance. For example, the McKnight Foundation, in collaboration with the University of Ouagadougou, is funding a circular bioeconomy initiative to reuse agronomic waste and promote sustainable practices within the region of Ouagadougou. The Turing Foundation, despite primarily addressing educational gaps, has frequently supported sustainability-oriented projects with other partners (Turing Foundation n.d.). The Veolia Foundation is another prominent contributor in the country with multiple projects and interventions for development. Under the context of RRR, in collaboration with the Burkinabé Association for Flushing and Cleaning (AB Curnet), the foundation has been supporting waste collection and recovery through compost in Ouagadougou (Veolia Foundation 2022). Furthermore, on a sectoral level, the Alliance for a Green Revolution in Africa (AGRA 2024) has consistently funded agriculture and agribusiness projects and interventions in the country, with an estimated USD 21.5 million invested since 2006.

Colombia

Apart from various incentive-linked monetary support schemes to businesses operating in the circular economy, 27 green economy trust companies fund and support RRR businesses. Cumulatively, their portfolio is worth over USD 88 billion, accounting for 37% of the total number of financial system investments (Serebrisky et al. 2015).

India

The Bill & Melinda Gates Foundation remains one of the prominent drivers for sanitation and waste management initiatives and has funded the establishment of a fecal sludge-to-conditioner plant in Karnataka (BMGF 2024). Similarly, The Coca Cola Foundation provided a grant to the nongovernment organization Sahaas (Brave) to promote waste segregation in 30 villages in Madhya Pradesh (Business News Week 2022). The Denmark-based Bestseller Foundation supports multiple projects across the waste management value chain to promote circularity and support livelihoods (BESTSELLER Foundation 2024a).



The H&M Foundation through its Saamuhika Shakti (Collective Power) initiative, seeks to economically uplift informal waste pickers in a consortium with eight other allied organizations in the sector (H&M Foundation 2024). The 3R Waste Foundation is another entity that facilitates circular approaches and practices, including integrated waste management, providing technical support and stakeholder engagement to enable synergized outcomes between private and public entities (3RWF 2018).

Kenya

In Kenya, the engagement of stakeholders and activities remains considerable. The Basecamp Explorer Foundation, for instance, has assisted the Masaai Tribe with proper waste management, enabling organic composting and resource recovery as well as preserving the environment (Basecamp Explorer 2018). The Bestseller Foundation has provided funding and other expertise to various companies working in the sectors of sanitation, biofuels, briquettes and animal feed – these enterprises include Sanergy, Vuma Biofuels, Zijani – in addition to funding various entrepreneurs working within the waste-to-value market such as Mike Fish Leather and Victoria Scapas. Both entrepreneurs utilize fish waste to create sustainable products (BESTSELLER Foundation 2024b). Apart from Bestseller, foundations like the Mott Foundation are assisting organizations to help achieve green energy, e.g. biomass uptake targets (Mott Foundation 2024). The Syngenta Foundation supports biosciences in eastern and central Africa (BecA Hub) for research and interventions in the circular bioeconomy (Syngenta n.d.). The BMGF is supporting Sanivation to create a waste-to-value ecosystem in Kenya (BMGF 2022).

Peru

Some of the foundations actively engaged in the domain include the Alstom Foundation – the social impact and funding arm of the rolling stock manufacturer Alstom (Alstom Foundation 2024) and the international voluntary collaboration platform Climate and Clean Air Coalition, which engages in a multidimensional manner (CCAC 2024). The Mastercard Center for Inclusive Growth utilizes Master Card's technical expertise and directs funding through the MasterCard Impact Fund (MasterCard Centre for Inclusive Growth 2024). Switzerland's official export and investment promotion platform, Switzerland Global Enterprise, is actively exploring commercial opportunities that create a social impact across the country (SGE 2021).

5.5. Green Bonds

Green bonds are a type of fixed-income financial instrument specifically designed to finance environmentally friendly projects (OECD 2015). They were introduced to raise capital for projects that have positive environmental or climate benefits. Green bonds are typically issued by governments, municipalities and corporations (Table 8 and details in Annex 3).

By promoting the issuance of green bonds, governments and organizations aim to mobilize capital towards sustainable projects, accelerate the transition to a low-carbon economy and address environmental challenges. Investors who purchase green bonds are attracted to them because they align with their environmental and social values. Green bonds offer an opportunity to invest in projects that have a positive impact on the environment while still earning a financial return. These bonds are typically structured as traditional bonds with fixed coupon payments and maturity dates.

TABLE 8. Green bond development in different countries.

No.	Country	Green Bond Regulatory authority	Green Bond Issuance
South Asia	**Bangladesh**	The Bangladesh Bank	Data not available
	India	Securities and Exchange Board of India (SEBI)	USD 21 billion (as of February 2023)
	Nepal	The Securities Board of Nepal	Data not available
	Sri Lanka	The Colombo Stock Exchange under the guidance of the Securities and Exchange Commission of Sri Lanka (SEC)	Data not available
Southeast Asia	**Cambodia**	Securities and Exchange Regulator of Cambodia (SERC)	USD 95 million (potential size of sustainable bonds within the Cambodia Sustainable Bond Accelerator)
	Vietnam	State Securities Commission	USD 284 million (as of December 31, 2020)
	Philippines	Securities and Exchange Commission	USD 2.9 billion (as of December 31, 2020)
North Africa	**Egypt**	Financial Regulatory Authority	USD 750 million (as of September 2020)
East Africa	**Ethiopia**	Information not available	Data not available
	Kenya	Nairobi Securities Exchange	KES 4.3 billion (as of October 2019)
	Rwanda	Information not available	Data not available
West Africa	**Burkina Faso**	Information not available	Data not available
	Ghana	Ghana Stock Exchange, Securities and Exchange Commission of Ghana	Data not available
South America	**Colombia**	Information not available	USD 3.6 million (as of September 2021)
	Peru	Ministry of Economy and Finance	Data not available

Source: Authors' survey.

5.6. Conclusion

The source of financial support to businesses plays a significant role in their development especially for a niche sector like the CBE. FDIs, lending and grants, lending interest rates and current initiatives such as green bonds substantially contribute towards access to finance for circular businesses across economies. Financing mechanisms for CBE projects seem promising in South and Southeast Asia. Asian countries are tapping into multiple sources of funding for such businesses. FDIs are an important source and are reportedly higher in India, Bangladesh, Vietnam and the Philippines as these countries have opened their economies and provide suitable regulations for investors. In these countries, although accounts held with financial institutions are higher, and interest rates are low, borrowing from formal institutions has yet to gather momentum. Countries like Sri Lanka and Cambodia where financial account holding and borrowing from formal institutions are higher need to adjust lending rates to make loans attractive for businesses. Donor grants in Cambodia, Nepal and Bangladesh are as high as 29%, 26% and 18% respectively in proportion to total government expenditure which is another important source for financing such businesses in these countries. In Latin America and Africa financial options are yet to mature – the FDIs are proportionately lower; formal loans are less than 10% in most African countries (except for Kenya) and between 18–21% in Latin America; high interest rates deter formal borrowing. Donor grants as a proportion to government spending are however higher in Africa compared to other regions which can contribute to the growth of the sector. Newer financing mechanisms like green bonds to finance circular economy projects are emerging in countries especially where financial regulations are better, and these countries need to harness the opportunity to grow the sector to maturity.

6

ENTREPRENEUR ECOSYSTEMS: MARKETS, NETWORKS AND POTENTIAL

6.1. Existing Firms in the RRR Ecosystem

Most waste collection and processing in South Asian and African countries remain largely informal activities, irrespective of the type of waste being collected. However, collaborations with waste collection companies to recover resources and reuse waste, as well as interventions by formal enterprises, community-based organizations and other stakeholders are picking up across countries. Food and agriculture waste is creating a major market opportunity for businesses to pursue.

Many organizations worldwide are implementing innovations and business models in this sector to generate excellent sources of livelihood. Throughout the food cycle, losses and wastage occur, at farms, processing plants, distribution centers, storage houses, supermarkets, restaurants and households. Hence the waste generated at each and every level could be turned into another product/by-product. Information from secondary sources has revealed that there are countless small enterprises working in this sector.

In all of the analyzed countries there are waste management companies and nongovernmental organizations supporting several initiatives in the waste management sector. Based on the United Nations Framework Convention on Climate Change database, Figure 26 shows the representation of projects that are functional and are registered under **Clean Development Mechanism (CDM)** projects across different countries. Areas such as biomass energy and methane avoidance predominate across the countries. Biomass energy mainly covers agricultural residues and methane avoidance captures manure and wastewater as subtypes of the work done in these countries. The data indicate that most of the projects are registered in Asian and African countries. Nepal, the Philippines, and Ghana are among the forerunners utilizing the CDM framework.

A man sorting garbage at the Mihisaru Wiyamana Open dumping site at the at the Resource Management Centre in Karadiyana, Sri Lanka.
Photography by Hamish John Appleby / IWMI

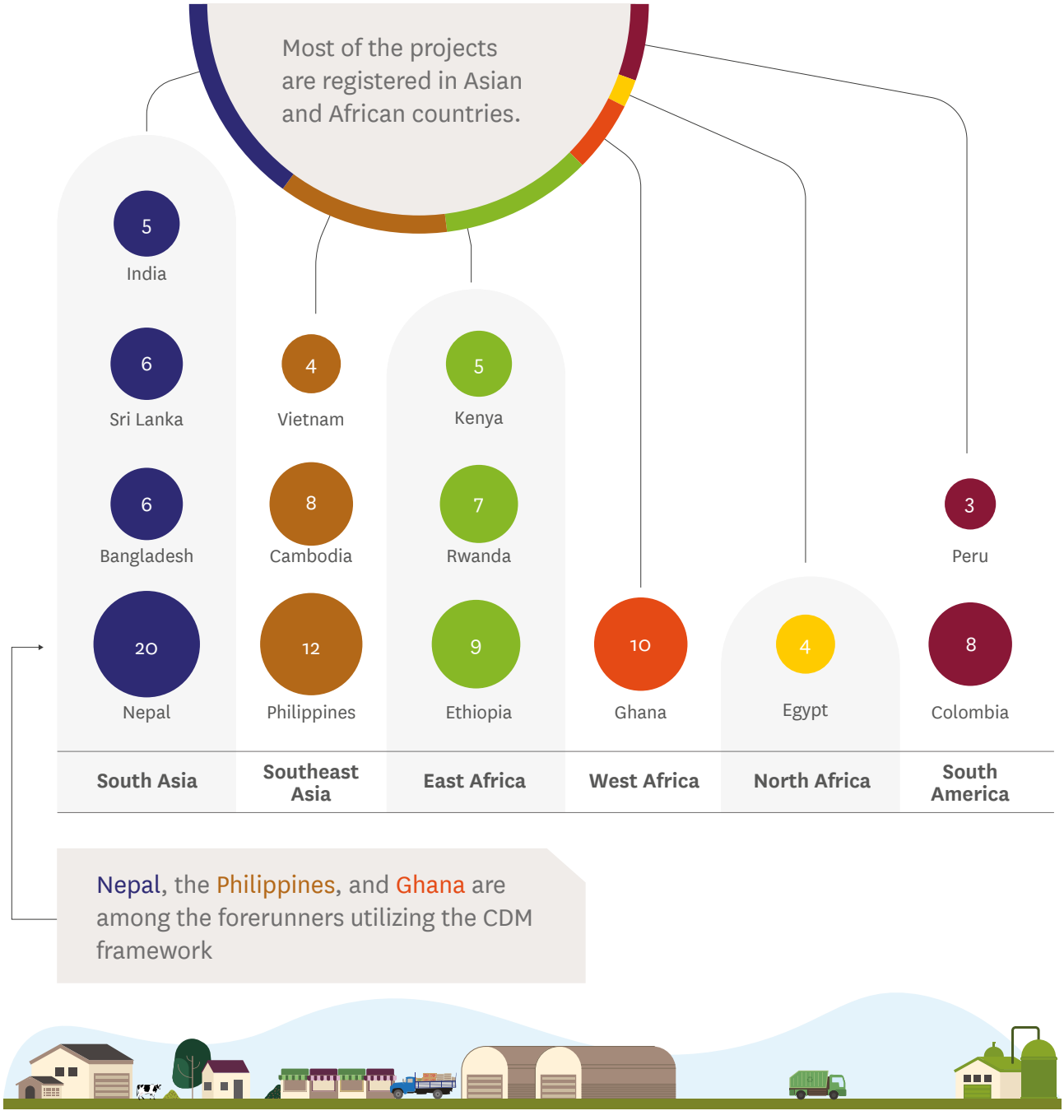


FIGURE 26. Percentage of CBE projects registered under the CDM.

Source: Calculated using data from UNFCCC 2024.
Note: Data for Burkina Faso were not available.

Secondary data sources from World Bank (2024, 2014b), UNU-INWEH (2019), Pheakdey et al. (2022), Jones et al. (2020) and UNESCAP (2014) indicate that more countries are willing to recover combustible renewables including waste[4] compared to wastewater and soil nutrients (like compost). This is illustrated in Table 9, where countries like Cambodia, Nepal, Ethiopia, Rwanda, Kenya and Sri Lanka have substantial thrusts on energy recovery. In contrast the proportion of compost converted from solid waste is insignificant. Similarly, wastewater treatment and reuse has not geared up and in most countries' information is unavailable.

[4] Combustible renewables and waste measures the use of solid biomass, liquid biomass, biogas, industrial waste and municipal waste as a percentage of total energy use. It is taken as an indicator for measuring energy production using solid waste as it includes the total percentage use of biogas and waste as energy in the respective countries. However, it should be noted that this dataset cannot be used as a direct measure for energy (or biogas) production from solid waste as it also includes solid biomass and liquid biomass.

TABLE 9. CBE products recovered across different countries.

Region	Economic Classification as per the World Bank	Country	Solid waste management		Wastewater reuse (%)
			Combustible renewables and waste (% of total energy)	Composting (%)	
Southeast Asia	Lower middle income	Cambodia	55.2	2	NA
		Philippines	13	5	NA
		Vietnam	23.8	15	NA
		Average based on lower middle income countries of East Asia and Pacific	28.43	7.33	5.95
South America	Upper middle income	Peru	11.2	0.83	2.72
		Colombia	8.9	1	NA
		Average based on upper middle income countries of Latin America & Caribbean	10.88	0.73	9.13
North Africa	Lower middle income	Egypt	2.3	7	23.44
		Average Based on lower middle income countries of Middle East & North Africa	3.72	3	26.69
South Asia	Lower middle income	India	21.4	18	2.8
		Bangladesh	25.6	5.25	NA
		Sri Lanka	45.2	5	NA
		Average based on lower middle income countries of South Asia	31.8	6.33	1.42
	Low income	Nepal	77.9	2.87	NA
		Average based on low income countries of South Asia	77.9	2.87	NA
East Africa	Lower middle income	Kenya	44.5	1	NA
		Average based on lower middle income countries of Sub-Saharan Africa	47.52	0.53	16.47
	Low income	Rwanda	83	0.4	NA
		Ethiopia	74.4	5	NA
		Average based on low income countries of Sub-Saharan Africa	50.93	2.68	1.99
West Africa	Lower middle income	Ghana	26.9	0.06	NA
		Average based on lower middle income countries of Sub-Saharan Africa	47.52	0.53	16.47
	Low income	Burkina Faso	2.73	NA	1.99
		Average based on low income countries of Sub-Saharan Africa	50.93	2.68	1.99

Sources: World Bank 2024; UNU-INWEH 2019; Pheakdey et al. 2022; Jones et al. 2020, World Bank 2014b; UNESCAP 2014.

6.2. Entrepreneur Ecosystems: Network Associations

Each assessed country has more than three associations (data for Egypt are not available) pertaining to the RRR sector. These associations are mostly related to climate change and the green/circular economy making the scope and outreach of the network huge but also generic at the same time. However, there are countries like India, where there is an association for biogas and biomass management. Table 10 describes the relevant RRR associations in the countries studied.

TABLE 10. Network associations promoting the CBE across different countries.

Region	Country	RRR network associations
East Africa	Ethiopia	The Ethiopian Chamber of Sectoral Associations (ECSAs), Global Green Growth Institute (GGGI), African Circular Economy Network, Bio-Economy Africa (BEA)
	Kenya	Kenya Private Sector Alliance (KEPSA), Climate Business Information Network (CBIN), Kenya Association of Manufacturers (KAM), Centre for Green Growth and Climate Change (CGGCC), Bioinnovate Africa, Biosciences eastern and central Africa (BecA), Kenyatta University, E4Impact, Kenya Association of Waste Recyclers (KAWR), Kenya Alliance of Resident Associations (KARA) and Kenya Green Building Society (KGBS)
	Rwanda	Cleaner Production and Climate Innovation Centre (CPCIC), The Private Sector Federation (PSF), The Kigali Chapter of Circular Economy Club (CEC)
North Africa	Egypt	NA
South America	Colombia	Andesco, Colombian Association of Sanitary and Environmental Engineering (ACODAL), Éa eco-businesses, The Colombian Association of Community-Based Water and Sanitation Service Providers (AQUACOL), Acción Climática, Cámara Verde de Comercio, Colombia Green Chamber, The Red Nacional de Agricultura Familiar (RENAF)
	Peru	A consortium of seven organizations sponsored by the Swiss Agency for Development and Cooperation – CO-SUDE, National Society of Industries (Sociedad Nacional de Industrias), Foreign Trade Society (ComexPerú), National Quality Institute (INACAL), Reciclame, National Network of Recyclers of Peru (RENAREP), Federaci n Nacional de Recicladores del Perú (FENAREP), ECOSAD
South Asia	Bangladesh	Infrastructure Development Company Limited (IDCOL), Bangladesh Agricultural University (BAU), Bangladesh Agricultural Research Institute (BARI), Annapurna Agro Service and Rural Development Academy (RDA), Katalyst, Innovision Consulting Pvt. Ltd., Rash Agro Enterprise, Achme Laboratories
	India	Indian Biogas Association, Confederation of Biomass Energy Industry of India (CBEII), The Biofuel Association of India
	Nepal	Solid Waste Management Association of Nepal (SWMAN), Waste Management Group Pvt. Ltd (WMG), Environmental Camps for Conservation Awareness (1987), Nepal Eco Club
	Sri Lanka	Sri Lanka Council for Agricultural Research Policy (CARP), Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI), Ministry of Livestock Development Sri Lanka, Department of Animal Production and Health (DAPH), Department of Cooperative Development (DCD), Department of Agriculture, Agricultural Extension in Sri Lanka, CGIAR, and the Postgraduate Institute of Agriculture, University of Peradeniya
Southeast Asia	Cambodia	UNDP in Cambodia has introduced a project in order to "mainstream the concept of a 'circular economy,'" in order to both reduce the amount of waste generated, and to promote sustainable solutions for dealing with waste in Cambodia
	Philippines	Water Environment Association of the Philippines, Inc. (WEAP), EcoWaste Coalition, The Solid Waste Management Association of the Philippines (SWAPP), National Ecolabeling Programme: Green Choice Philippines (NELP-GCP), Circulo Initiative
	Vietnam	Vietnam Circular Economy, WasteAid, Circular Economy Network, The Institute for Circular Economy Development (ICED), The Vietnam Cleaner Production Centre (VNCPC)
West Africa	Burkina Faso	Switch Africa Green (SAG) programme of the United Nations Environment Programme (UNEP), L'Association Centre Ecologique Albert Schweitzer du Burkina Faso (CEAS Burkina), SOS Energie Burkina, The Center for Economic and Social Studies and Experiments in West Africa – International Association (CESAO-AI), L'Association Faso EnviProtek (Association Faso Enviprotek), La Fédération des associations des ramasseurs d'ordures ménagères (FORAM), L'Association Leadership Innovation Entreprenariat (LIEN), Association-Jeunesse-Sans-Frontières Burkina (AJSFB), Association Wêndbenedo and Africa Ecologie Association
	Ghana	African Circular Economy Network Ghana, Environmental Services Providers Association (ESPA), Ghana Hubs Network, Ghana International Business Network, Biogas Association of Ghana

Source: Compiled by authors.
Note: Data for Egypt were not available.

6.3. Registering a Product Related to RRR

There are multiple associations that support enterprises in the RRR ecosystem. This section highlights details for registering RRR products and the related time and cost involved. Table 11 clarifies the preliminary requirements and the nodal departments dealing with licensing and the registration process.

TABLE 11. Preliminary requirements and nodal departments for licensing and registration of CBE products in different countries.

Region	Country	Product – compost/biofertilizer				
		Cost to register	Time to register	Preliminary/minimum requirement to register	Nodal authority for registration	Source of information (link)
East Africa	Ethiopia	NA	NA	Follow European Union and United States standards	Environment Protection Agency	Global Business Network Program
	Kenya	NA	NA	NA	National Environment Management Authority	National Environment Management Authority
	Rwanda	1. Application fees for licence or permit – RWF 50,000 (irrespective of the outcome of the application) 2. Permit fees for the construction or installation – RWF 200,000 3. Operation license fee –RWF 500,000 4. Annual regulatory fees – 1% of annual turnover	NA	1. The waste recycling unit is at least 100 meters from residential complexes 2. The waste recycling unit is secure from scavengers 3. It does not cause pollution 4. There is adequate ventilation at the facility 5. The final compost product to be stored in a space with a 2% drainage gradient so that nutrient-rich runoff can be directed into a storm water management system	Rwanda Utilities Regulatory Authority	Rwanda Utilities Regulatory Authority
North Africa	Egypt	NA	3–6 months	1. Certificate of analysis of the product 2. Leaflet for recommendations for use 3. Samples of products could be required	Waste Management Regulatory Authority Egypt	Waste Management Regulatory Authority Egypt; Fertilizers Consultant Network (Fertcon)
South America	Colombia	NA	NA	NA	NA	NA
	Peru	NA	NA	NA	1. Ministry of Environment 2. Ministry of Health (provides licenses to the entity responsible for providing solid waste-related services) 3. Agency for Environmental Assessment and Enforcement (OEFA) – supervises sectorial authority	OEFA

Region	Country	Product – compost/biofertilizer				
		Cost to register	Time to register	Preliminary/minimum requirement to register	Nodal authority for registration	Source of information (link)
South Asia	Bangladesh	NA	Approximately 30 days	1. To define the physical characteristics of the fertilizer a. Physical condition b. Solubility c. Particle size d. Toxicity e. Stability f. Moisture	Department of Agriculture Extension	Application form for Standardization of New Fertilizer/Biofertilizer
	India	INR 2,250 license fee for fertilizer/ pesticide (Odisha)	45 days from the date of application (in Assam)		Department of Fertilizers, Government of India	Department of Fertilizers, Government of India – Procedure of licensing, sampling and enforcement for quality and quantity distribution of fertilizers in Assam Registration of Fertilizer Certificate
	Nepal	NA	NA	NA	Agriculture Input Corporation, Ministry of Agriculture, Government of Nepal	Manadhar and Khanal
	Sri Lanka	Quality certification (fertilizers), Department of Agriculture (DOA) –LKR 575	NA	1. Sterilized solid organic fertilizer not to comprise any element hazardous to plants, animals and humans. 2. It should enhance the properties of the soil	1. National Fertilizer Secretariat, Ministry of Agriculture, Sri Lanka 2. Centre of Excellence for Organic Agriculture	Commercial organic fertilizer production issues and prospects
Southeast Asia	Cambodia	As prescribed by the law	NA	1. Analysis of pesticide sample 2. Bioefficacy of the pesticides 3. Label and material safety datasheet – organic matter should not be less than 20%	Ministry of Agriculture, Forestry and Fisheries, Kingdom of Cambodia	Law on the Management of Pesticides and Fertilizers
	Philippines	Registration fee for organic fertilizer Local – PHP 1,800 Imported – PHP 4,200	NA	1. Hygiene standard for the facility 2. Waste disposal at the facility 3. Ventilation at the facility 4. Recommendations by the FPA	Fertilizer and Pesticide Authority (FPA)	Fertilizer regulatory policies and implementing guidelines
	Vietnam	NA	NA	NA	NA	
West Africa	Burkina Faso	NA	NA	NA	Government of Burkina Faso	
	Ghana	NA	NA	NA	Pesticide and Fertilizer Regulatory Division in Plant Protection and Regulatory Services, Ministry of Food and Agriculture	Pesticide and Fertilizer Regulatory Division in Plant Protection and Regulatory Services, Ministry of Food and Agriculture

Source: Authors' survey.

6.4. Conclusion

The developing economies of South Asian, Southeast Asian, Latin American and African regions have a higher scope for CBE as increased generation of waste and greenhouse gas emissions have been observed. From the analysis, it was evident that the representative countries have a conducive entrepreneurial ecosystem that is gradually promoting the emergence of resource recovery firms from sustainable waste management projects, especially in the areas of biogas energy production and methane avoidance, which are facilitated by existing network associations, mostly related to climate change and the green/circular economy. In contrast, countries need to plan for recovering soil nutrients from the organic fraction of the solid waste and water treatment and reuse for growing urbanization needs and meet the requirement of soil depletion and water scarcity especially in agriculture and closing the loop.

7

CONCLUSIONS AND RECOMMENDATIONS FOR ENABLING A CIRCULAR BIOECONOMY INVESTMENT CLIMATE

The present study is based on an analysis of different indicators and criteria to assess the investment climate across different countries to promote the CBE. To make it rigorous it draws data and inference from diverse secondary sources. The report presents data sourced from publicly available forums such as published documents, government websites and international reports, which ensures objectivity and avoids subjective judgment. However, the major limitation was the lack of systematic data to draw conclusive findings. A more detailed primary study, conducted on a country-by-country basis, involving specific interventions in RRR businesses and discussions with relevant stakeholders, could have provided clearer insights into the real-world implications of the information presented in the report. Additionally, a triangulation of field data with the information presented in the report could have offered a more comprehensive understanding of the investment climate in each studied country. The major findings from the study are presented hereunder.

As the report clearly indicates, each country or region has its own benefits and limitations when it comes to promote CBE initiatives. For understanding the commercial aspects and viability of the CBE framework, this report analyzed the prevailing legal, financial and operational landscapes across the studied countries.

The analysis revealed **four key areas** that are addressed either through comprehensive laws, policies or specific regulations: **(1) solid waste management (including waste segregation), (2) wastewater management, (3) sanitation and fecal sludge management and (4) renewable energy, specifically biogas and biomass**. All 15 countries have incorporated these areas into their administrative norms, indicating widespread awareness among policy-makers, regardless of the country's governance structure. Recognizing the need to sustain remaining resources, all countries have one or more public institutions, ministries or departments dedicated to environmental issues, with a particular focus on the principles of circularity. The environmental laws and regulations are in place in all of these countries. However, enforcement and stringency vary and this requires attention and consideration as countries are formulating policies and preparing strategic plans for implementation of CBE practices.

Section 3, Business Climate and Associated Procedures, provides a comprehensive overview of the prevailing trends in each analyzed country. Business procedures encompass every aspect of starting a business from foundation. The demand for streamlined timelines and problem-free processes is crucial in developing economies. Based on the precise information presented in this section, it is evident that some countries have improved their investment attractiveness over time and have created competitiveness.

In terms of governance climate, it is worth mentioning that each of the 15 countries are striving to achieve sustainability in its development efforts. With regard to infrastructure, all countries are actively seeking investments, particularly in the energy sector, which is a vital component of the RRR ecosystem. The analysis shows that over 10 out of 15 countries have specific incentives, tax redemptions and rebates related to RRR initiatives, both for domestic and commercial purposes. Peru, Columbia, India, Vietnam and the Philippines, are comparatively more attractive destinations for entrepreneurs.

Of all the factors mentioned, the source of financial support for RRR businesses plays the most significant role in their development. Inclusion is a fundamental pillar for strengthening any country's economy, so it is given priority in the section on access to finance. Foreign direct investments, loans, grants, lending interest rates and current initiatives, such as green bonds, significantly contribute to enhancing access to finance for RRR businesses across economies. Financing mechanisms for CBE projects seem to be promising in South and Southeast Asia. Asian countries are tapping into multiple sources of funding for such businesses while African nations are still relying on donor-based grants and funds to initiate circular economy projects. It is evident that countries are more skewed towards energy recovery mechanisms rather than planning recovery of soil nutrients from organic waste sources and reclaiming water for reuse.

In spite of such joint efforts there are several reasons why the RRR concept may not be picking up to achieve the desired outcome in certain contexts:

Lack of awareness and education:

Limited awareness and understanding among the general public about the importance and benefits of RRR can hinder its adoption. Insufficient education on waste management practices and the environmental impact of improper waste disposal may contribute to a lack of engagement with RRR principles.

Infrastructure and logistics challenges:

Implementing effective RRR systems requires well-developed infrastructure for waste collection, segregation, recycling facilities and efficient logistical networks. Inadequate infrastructure and logistical challenges can hinder the smooth functioning of RRR initiatives, making it difficult for individuals and businesses to participate.

Economic considerations:

RRR practices can involve higher costs compared to traditional waste disposal methods. This can discourage businesses and individuals from investing in RRR, especially if they perceive short-term financial benefits in alternatives such as landfilling or incineration.

Limited market demand for products:

The success of RRR enterprises heavily relies on the demand for their products. If there is a lack of market demand for the materials or if industries are not willing to incorporate the materials into their production processes, this can create challenges for the RRR enterprise and deter investment in recycling infrastructure.

Inconsistent policies and regulations:

Inconsistent or insufficient policies and regulations related to waste management and RRR can impede progress. Clear and supportive policies, including incentives and regulations that promote RRR practices, are necessary to encourage adoption at household, business and industrial levels.

Behavioral and cultural factors:

Changing consumer behavior and habits related to waste generation and disposal can be challenging. Cultural norms and convenience-driven behaviors may resist the adoption of RRR practices, especially if alternatives are more readily available or if there is a lack of social pressure or incentives to change.

Addressing these challenges requires a multifaceted approach, including increased awareness and education, investment in infrastructure, supportive policies and regulations, market development for recycled products, and technological advancements. Overcoming these barriers can help to foster the widespread adoption of RRR practices and contribute to achieving the desired environmental outcomes.

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ANNEXES

ANNEX 1. Regulations and Laws to Support RRR Businesses in the Studied Countries.

Region	Country	Legal instruments
Southeast Asia	**Cambodia**	• Rectangular Strategy Phase IV of Cambodia • National Strategic Development Plan 2019-2023 • National Environmental Strategy and Action Plan 2016-2023 • Cambodia Climate Change Strategy Plan 2014-2023 • Cambodia's First (2002) and Second (2015) National Communication to the UNFCCC • Cambodia's First NDC and Second NDC (2020) • Cambodia National Strategic Plan on Green Growth 2013-2030 • Cambodia National REDD+ Strategy 2017-2026 • National Protected Area Strategic Management Plan 2017-2031 • National Forest Programme 2009-2029, Production Forest Strategic Plan (draft) • National Biodiversity Strategy and Action Plan (2016), Cambodia Industrial Development Policy 2015-2025 • National Sustainable Consumption and Production Roadmap (in preparation) • National Energy Efficiency Policy (draft) • The Intermodal Transport Master Plan (2021-2030, draft)
South America	**Colombia**	• National Policy for Comprehensive Waste Management (1997) • National Environmental Policy for the Sustainable Development of Oceanic Spaces and the Coastal and Insular Areas of Colombia (2000) • National Environmental Education Policy – SINA 2002 • Urban Environmental Management Policy 2002 • National Policy Sustainable Production and Consumption (2010) • National Policy for the Comprehensive Management of Water Resources 2010 • Policy for Comprehensive Environmental Soil Management 2015 • National Policy on Climate Change 2016 • National Policy on Integrated Solid waste Management 2016 • Green Growth Policy 2018 • National Circular Economy Strategy 2019 • National Development Plan "Pact for Colombia, Pact for Equity" 2018-2022
East Africa	**Kenya**	• The Environmental Management and Coordination Act (EMCA) 1999 • The Environmental Management and Co-ordination (Water Quality) Regulations 2006 • The Environmental Management and Co-ordination (Waste Management) Regulations 2006 • The New Constitution of Kenya 2010 • The Public Health Act (Revised) 2012 • The Environmental Management and Co-ordination (Air Quality) Regulations 2014 • The Climate Change Act 2016 • The Energy Act 2019 • Draft Environmental Management and Co-ordination (Extended Producer Responsibility) Regulations 2021 • The Sustainable Waste Management Act 2022
South America	**Peru**	• General Solid Waste Law of 2000 (Law No. 27314-2000) • Organic Law for Municipalities of 2003 (Law No. 27972) • General Environmental Law of 2005 (Law No. 28611) • Supreme Decree No 002-2009-MINAM, National Environment Policy 2009 • Establishment of a Framework to Protect and Enable Waste Pickers 2009 • Updating Penal Provisions to Prescribe Harsher Penalties and Punishments for Polluting 2013 • Management of Construction and Demolition Waste 2013 • Law on the Integral Management of Solid Waste (Law No. 27314) 2016 • Comprehensive climate change framework which mandates the responsibility of looking after Nationally Determined Contributions (NDCs) 2019 • Establishing a roadmap toward the circular economy in the industrial sector 2020 • A COVID-19 update to the 2016 Solid Waste Law – enabling easier waste collection and disposal by companies 2020

Region	Country	Legal instruments
Southeast Asia	**Philippines**	• Republic Act (RA) 9003-Ecological Solid Waste Management Act 2000 • PD 856 – Code of Sanitation of Philippines 2004, RA 9275 – Philippines Clean Water Act 2004 • RA 9513 – Renewable Energy Act 2008 (RE ACT) 2008 • RA 9512 – Environmental Awareness and Education Act of 2008 • RA 9729 – Climate Change Act of 2009, RA 10771 Green Jobs Act 2016 • Philippines Energy Efficiency and Conservation Roadmap 2017-2040 • House Bill 7609 – Philippine Circular Economy Act
South Asia	**Bangladesh**	• Draft National Solid Waste Management Rules 2005 • Environment Management Plan 2005, Solid Waste Management Action Plan for Eight Secondary Towns in Bangladesh 2005 • National Sanitation Strategy 2005, Fertilizer Act 2006, Fertilizer Management Rules 2007 • National Renewable Energy Policy 2008, Circular to Promote Compost by the Ministry of Agriculture (MoA), on 23 April 2008 • National Renewable Energy Policy 2008 • National Solid Waste Management Handling Rules 2010 • National 3R (Reduce, Reuse and Recycle) Strategy for Waste Management 2010 • Sixth Five-year Plan (FY2011-2015) • Land Use Policy 2011 • National Science and Technology Policy 2011 • National Agricultural Policy 2012 • National Environment Policy 2013 • National Policy for Water Supply and Sanitation 2014 • National Sanitation Strategy 2014 • National Industry Policy 2016
East Africa	**Ethiopia**	• The Ethiopian Environmental Policy 1997 • The Ethiopian Environmental Policy 1997 • Policies by Federal Democratic Republic of Ethiopia (FDRE) on municipal solid waste and international waste management conventions • Ethiopian Water Resources Management Policy • Urban Wastewater Management Strategy 2015 • National Strategy for Improved Hygiene and Sanitation • The Environmental Pollution Control Proclamation No. 300/2002 • The Ethiopian Public Health Proclamation No. 200/2000 • National Electrification Program (NEP) 2.0 • Agriculture Development Led Industrialization (ADLI) policy • National Biogas Programme of Ethiopia
West Africa	**Ghana**	• Environment Protection Act 490 1994 • Local Government Act (Act 462) 1993 • Ghana Landfill Guidelines 2002 • National Environmental Sanitation Policy (ESP) 2010 • National Environmental Sanitation Strategy and Action Plan (NESSAP) 2010 • Renewable Energy Act (Act 832) 2011 • Ghana National Climate Change Policy 2013 • Strategic National Energy Plan (SNEP 2030) 2014 • Hazardous and Electronic Waste Control and Management (Act 917) 2016
South Asia	**India**	• The Water (Prevention and Control of Pollution) Cess Act 1977 • Hazardous Wastes (Management and Handling) Rules (1989, amended January 2003 • August 2010, April 2016), Biomedical Waste (Management and Handling) Rules (1998, amended September 2003, March 2016) • Municipal Solid Wastes (Management and Handling) Rules (2000, amended April 2016) • National Urban Sanitation Policy 2008 • Service Level Benchmarks (SLBs) 2008 • PPP Toolkit for SWM 2012, Construction and Demolition Waste Management Rules 2016
South Asia	**Sri Lanka**	• Rural Water Supply and Sanitation Policy 2001, National Land Use Policy 2007 • National Plantation Industry Policy Framework 2006 • National Livestock Breeding Policy Guidelines and Strategies 2010 • Sri Lanka Rubber Industry Master Plan 2017-2026 • National Policy and Strategy on Cleaner Production for the Agriculture Sector 2012 • National Agricultural Research Policy and Strategy 2018-2027 • National Policy on Waste Management 2019 • The National Policy on Waste Management 2019 • Road Map on Urban Food Waste Prevention and Reduction for Households, Food Services, Retailers, and Wholesalers 2021 • National Agriculture Policy (Policy Action 2.11 Enforce a regulatory framework for organic/bio fertilizer production) 2021

Region	Country	Legal instruments
Southeast Asia	**Vietnam**	• Law on Environmental Protection 2014 • National Strategy on Environment Protection by 2020, with a vision toward 2030 • National Green Growth Strategy • National Action Plan on Sustainable Production and Consumption up to 2020 • Mineral Law 2010 • Law on Water Resources 2012 • Land Law in 2013 • Strategy on Cleaner Production in Industry to 2020 • Circular No. 128/2016/TT-BTC, Decision 16/2015/QD-TTg and Resolution No. 579/2018/UBTVQH14 on distribution and consumption • Sustainable Development Strategy of Vietnam 2011-2020 • National Strategy for General Management of Solid Waste to 2025 • Decree 38/2015/ND-CP and Decree 19/2015/ND-CP on municipal solid waste management
West Africa	**Burkina Faso**	• The Environment Code of Burkina Faso 1997 (Law 005/97/AD) • The Public Hygiene Code 2005 (Law No. 022-2005/AN) • The Environment Code 2013 • The Sustainable Development Orientation Law (Law No. 008-2014/AN)
North Africa	**Egypt**	• Law 4/1994, National Strategy for Integrated Solid Waste Management, June 2000 • Integrated Water Management Unit 2003 (under the Ministry of Water Resources and Irrigation) • Integrated Water Management Unit 2005-2017 (under the Ministry of Water Resources and Irrigation) • National Solid Waste Management Program 2011 • The Egyptian Sustainable Consumption and Production Plan (SCP-NAP) developed under the Ministry of Environment and Development for Arab Region and Europe (CEDARE) under the EU-funded SwitchMed Programme 2015 • Waste Management Law 2020
South Asia	**Nepal**	• Solid Waste (Management and Resource Mobilization) Act, 1987 • Municipality Act 1992 • Environmental Protection Act (EPA) 1997 • Solid Waste Management Act 2011 • Environmental Protection Act 2019
East Africa	**Rwanda**	• Organic Law Determining the Modalities of Protection • Conservation and Promotion of the Environment in Rwanda (No. 04/2005 of 08/04/2005) • Law No. 16/2006 of 03/04/2006 • Law No. 48/2018 of 13/08/2018 on Environment

ANNEX 2. Definitions of Each of the Indicators under Ease of Doing Business.

- **Time to start a business:** Procedures include the processes entrepreneurs undergo when obtaining all necessary approvals, licenses, permits and completing any required notifications, verifications or inscriptions for the company and employees with relevant authorities. The ranking of economies on the ease of starting a business is determined by sorting their scores for starting a business. These scores are the simple average of the scores for each of the indicators' components (World Bank 2019a).

- The dealing with **construction permits:** Measures the building quality control index, evaluating the quality of building regulations, the strength of quality control and safety mechanisms, liability and insurance regimes and professional certification requirements (World Bank 2019a).

- **Getting electricity:** Measures the procedures, time and cost required for a business to obtain a permanent electricity connection for a newly constructed warehouse. Additionally, the reliability of supply and transparency of tariffs index measures supply reliability, transparency of tariffs and the price of electricity (World Bank 2019a).

- **Registering a property:** Examines the steps, time and cost involved by assuming a standardized case of an entrepreneur who wants to purchase land and a building that is already registered and free of title dispute. In addition, it measures the quality of the land administration system in each economy. The quality of land administration index has five dimensions: reliability of infrastructure, transparency of information, geographic coverage, land dispute resolution and equal access to property rights (World Bank 2019a).

- **Paying taxes:** Records the taxes and mandatory contributions that a medium-size company must pay in a given year as well as measures of the administrative burden of paying taxes and contributions and complying with postfiling procedures. Taxes and contributions measured include the profit or corporate income tax, social contributions and labor taxes paid by the employer, property taxes, property transfer taxes, dividend tax, capital gains tax, financial transactions tax, waste collection taxes, vehicle and road taxes, and any other small taxes or fees (World Bank 2019a).

ANNEX 3. Green Bonds across Different Countries.

South Asia

India: The economy has emerged as one of the leading countries in green bond issuance within the region. The country has a robust green bond market, with both public and private sector entities issuing them. India has seen significant activity in renewable energy and green infrastructure projects, attracting both domestic and international investors. India's issuance of Sovereign Green Bonds can be seen as its commitment towards reducing its carbon footprint. Green bonds seem to be a two-pronged solution, i.e. to not only support the economy, but also to re-invest the proceeds into domains such as renewable energy, clean transportation, sustainable water, waste management and so on. India has gradually picked up pace by creating a sound framework (World Bank 2023c) for the Green Bond Program, in fact, the program received technical assistance from The World Bank's Sustainable Finance and ESG Advisory Services for it (Hussain and Dill 2023). This also shows that the green bond domain is emerging as one of the key areas for boosting the green economy.

However, India's counterparts such as Bangladesh, Nepal and Sri Lanka are only just beginning to leverage the potential of green bonds, although these financial instruments have received extensive attention in recent years.

Sri Lanka: In April 2023, Sri Lanka devised a framework (CSE 2023) with support from the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) and the Global Green Growth Institute (GGGI) to sell green bonds. This step was taken for the first time in Sri Lanka which has the potential for debt restructuring as well as green economy financing.

Bangladesh: The country has been working for a long time to introduce green bonds. In 2019, the International Finance Corporation and The Bangladesh Bank conducted a market landscape study (Vivid Economics, IFS and Bangladesh Bank 2019) to analyze the future of green bonds in the country and gave a detailed analysis on the need for a framework for such financial instruments. In line with the findings of the study, in September 2022, The Bangladesh Bank promulgated the policy on Green Bonds Financing for Banks and Financial Institutions (Bangladesh Bank 2022).

Nepal: Banking and financial institutions are developing substantial interest in tapping the green bonds market (UNDP 2021).

Southeast Asia

Cambodia: The country has been strengthening its infrastructure to support green bond financing. According to a Green Bond Market Survey conducted by the Asian Development Bank (ADB 2022a), renewable energy is the most promising sector for green bonds in Cambodia, followed by energy efficiency, water management, renewable energy, waste management and the circular economy. The findings of the survey also highlighted that institutional investors were not only interested in green bonds but were also willing to explore opportunities in the issuance and investment arenas. Consequently, considering the rising demand for green bonds, in March 2023, the Cambodia Sustainable Bond Accelerator (ESCAP 2023) was launched by the Securities and Exchange Regulator of Cambodia, the Credit Guarantee and Investment Facility and GuarantCo (part of the Private Infrastructure Development Group) in collaboration with UNESCAP and the GGGI. Within the purview of the accelerator, three private sector bond issuers would be supported in the process of issuing green and sustainability bonds.

Vietnam: Unlike Thailand, Malaysia and Indonesia, Vietnam has not been able to cash in on the rising demand for green bonds and green financing opportunities in the country (MOF 2021). An analysis article by McKinsey estimates that financial institutions in Vietnam could earn USD 1.7 billion in revenue by 2025 by issuing green bonds (Chandhok et al. 2022). Although the Vietnamese government assigned the state bank to promote financial tools in 2015, in order to generate substantial revenue through green bonds, Vietnam still needs to strengthen the regulatory framework and one of the major steps in this direction has been the Vietnam Green Bond Readiness Program (GGGI 2020) by the GGGI, which will not only help the government to strengthen the green bond regulatory framework, but will also empower the government and other stakeholders to participate in green bond issuance, thereby facilitating the increase in green bond issuance.

The Philippines: The largest bank in the country, BDO Unibank Inc., issued its first green bond in 2017, which raised a total of USD 150 million to finance private sector investments addressing climate change (IFC 2024). In 2018 the Philippines issued guidelines (SEC 2018) for the issuance of Green Bonds (ASEAN green bonds) under the ASEAN green bonds standards (ACMF 2018). Despite the issuance of guidelines, providing a framework for the green bonds, it has been noticed that the Philippines' sustainable bond market has a small share in comparison to the corporate bond market of the country (ADB 2022b).

Africa

Egypt: In 2018, Egypt's Financial Regulatory Authority issued a legal framework facilitating the issuance of green bonds to finance green projects (Green Finance Platform 2018). Consequently, Egypt became the first country in the Middle East and North Africa (MENA) region to issue a bond worth USD 750 million (World Bank 2022d) in September 2020, (Green Financing Working Group 2021) which helped Egypt to fulfil its goal of attaining transparency in finance and reflect its environmental priorities in the domestic and international markets. Further, Egypt has won several awards for its green bonds and has emerged as a green market pioneer in the MENA region. The issuance of green bonds has helped Egypt fund projects in such domains as clean transportation and sustainable water and waste management.

Kenya: Kenya has its own Green Bond Program (Green Bond Program 2017), which was launched in 2017 (Green Finance Platform 2019). The goal of the program was to develop a domestic market for green bonds. The creation of the program led to the issuance of the country's first green bond in 2019, the proceeds from which were utilized to provide 5,000 university students with ecofriendly housing. The Green Bond Program in Kenya funds projects related to climate change mitigation, pollution, loss of biodiversity and so forth (NSE 2024). Eligible projects for the financing under the purview of the green bonds have been divided into two broad categories, namely, Climate Bonds Taxonomy and The National Policy on Climate Finance with overlapping sectors.

Rwanda: The data on green bonds in Rwanda are scanty. However, the Rwanda Green Fund (FONERWA), which is also one of the first national environment and climate change investment funds in Africa, was established to provide funding for public and private projects to drive change in the country (UNFCCC 2018). A report on the finance sector (Hogarth 2011) of the country also highlighted that in the future it could also possibly issue green bonds.

Ghana: As in many parts of Africa, green financing is in its infancy in Ghana as well. However, according to a feasibility study for development of the green bonds market in Ghana (FSD Africa 2021), the government is open to exploring the green bonds market in the country. Despite the collaboration (IFC 2021) of the International Finance Corporation and Securities and Exchange Commission (SEC 2021) of Ghana to facilitate green financing through green bonds, the feasibility study reported that although there is potential for the financing of projects in the areas of, *inter alia*, climate change, green buildings and wastewater management green bonds in Ghana, there are several challenges such as lack of knowledge, information and supporting policies.

South America

Colombia: Colombia issued its first sovereign green bond in 2021 (World Bank 2022e), acting as a torch bearer for other countries in Latin America and the Caribbean. In Colombia, green bonds fall under the broad category of use of proceed bonds. The use of proceed bonds also comprise climate, climate-aligned, blue, social and sustainability bonds. Another important category in Colombia is that of sustainability bonds which have been designed to attract investors by pledging funds to various programs.

Peru: Peru has a dedicated Sustainable Bond Framework (MEF 2021) under which the government can issue three types of bonds namely, green bonds, social bonds and sustainable bonds. Net proceeds of the green bonds are dedicated to finance eligible green projects.

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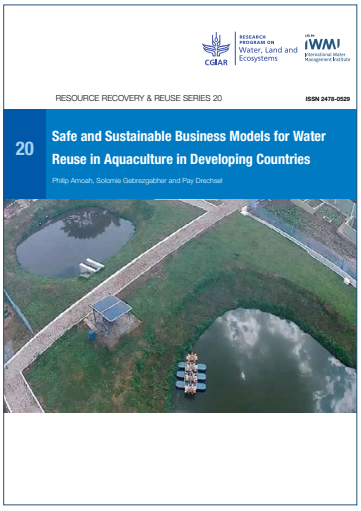

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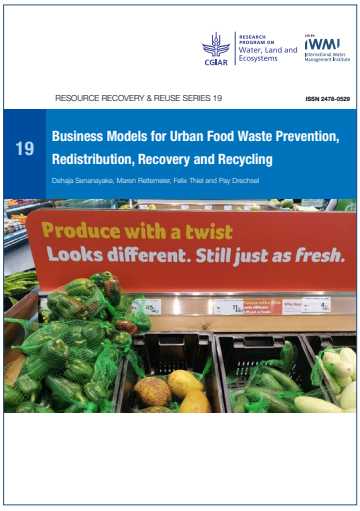

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ISSN 2478-0510 (Print)
ISSN 2478-0529 (Online)
ISBN 978-92-9090-966-8