Mainstreaming Resource Efficient and Cleaner Production in South Asia

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- **Background and Context**

The Resource Efficient and Cleaner Production (RECP) agenda is part of international efforts to make industrial production more sustainable. The idea is simple: preventing the generation of waste and emissions in industry makes more sense than trying to recycle, recover and treat waste and pollutants once created or already discharged into the environment. From the mid 1980's onward industrialised countries, starting from North America and Western Europe, launched programs to demonstrate this preventive approach in manufacturing and related sectors. Since then, RECP has spread to many countries and business worldwide.

RECP can be a triple-win for the economy, the environment and society. The use by firms of more efficient and greener technologies and practices can yield a broad range of economic, environmental and social benefits (**Error! Reference source not found.**), thus contributing to all three pillars of sustainable development.

The international evidence shows that there is generally substantial scope for individual firms in environmentally-damaging sectors to improve resource efficiency and reduce pollution/waste. Over two decades after the concept was popularized, there is strong evidence from the literature that RECP has proven to be an effective approach, capable of generating the above-mentioned environmental, economic and social gains in a large diversity of countries and sectors. The potential for such gains is especially large in resource-intensive and polluting sectors (e.g. leather, textile, pulp and paper) and in developing countries where production is dominated by small and medium-sized enterprises (SMEs) with low environmental management capacity.

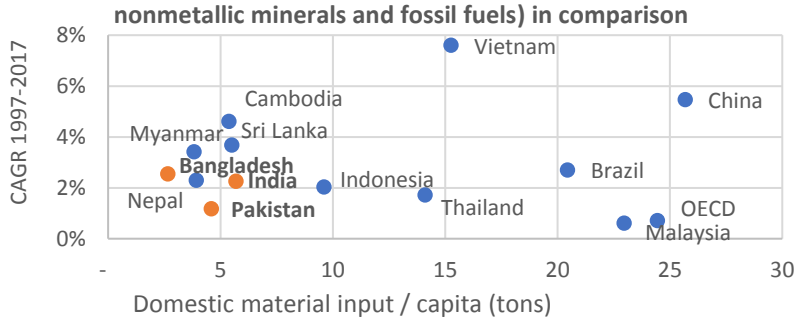
The implementation of RECP can be hampered by various obstacles and governments have an important role to play to foster it through adequate policies. The global experience with RECP shows that multiple constraints can limit firms' capacity to invest in profitable RECP options, including information, technical and financial constraints. Governments can aim to ease these constraints by through different environmental policy instruments, as well as potentially more direct forms of support to firms. Establishing a conducive environment can also require adopting strategies, establishing institutions and initiating public-private dialogue on relevant issues.

This report was prepared under a regional technical assistance program on RECP in South Asia implemented by the World Bank over 2017-2019. This builds on the Bank's previous engagement on RECP in the region, including several country-level analytical, advisory and financing activities over the last decade. The regional program, which was made possible by support from the Korean Green Growth Trust Fund (KGGTF), aims at providing technical assistance on RECP to South Asian policymakers, focusing on Bangladesh, India and Pakistan, and to facilitate knowledge exchanges within and outside the region. This report's objective is to address knowledge gaps on RECP in these three countries, provide a comparative assessment and identify policy interventions that could facilitate a more widespread adoption of RECP by manufacturing firms, including SMEs.

- **Key Findings and Observations**

The available evidence for South Asia suggests that several key manufacturing sectors currently operate at low resource efficiency levels. Studies in the region have shown that firms in resource intensive and polluting sectors, especially SMEs, tend to use materials, energy and water inefficiently. Improving resource efficiency is going to be even more crucial going forward: while South Asia's use of materials in production and consumption activities is still low on a per capita basis (Figure 1), it should grow significantly in the future as the region continues industrializing and urbanizing.

Figure 1. South Asia's use of materials (biomass, metal ores, nonmetallic minerals and fossil fuels) in comparison



Source: UN Environment (2018) International Resource Panel Global Material Flows Database

South Asia is among the world's most polluted regions, notably due to high industrial pollution levels. India, Bangladesh and Pakistan ranked 180, 178 and 177 respectively out of 180 countries for environmental health on Yale's 2018 Environmental Performance Index (air quality, water and sanitation, and exposure to heavy metals). Industries are a major source of air, water and soil pollution, and in many cases exceed applicable environmental standards and good international industry practices. A dozen sectors, almost identical for all three countries, have highly adverse environmental impacts while being economically significant, and can therefore be considered as priority for interventions (Table 1). Pollution has become a major public health hazard, with both social and economic impacts. Moreover, poor industrial resource efficiency and pollution/waste management also undermine more directly the productivity and competitiveness of industries.

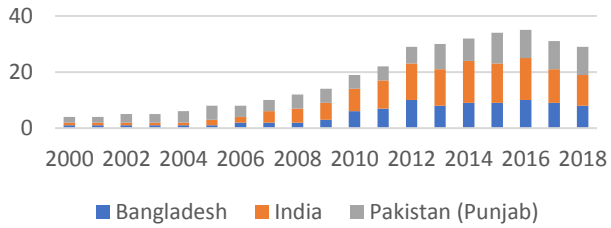
Table 1. Main Polluting Sectors in South Asia

Sector	Energy	Pollution intensity			Country relevance		
		Water	Air	Waste	Bangladesh	India	Pakistan

Brick kilns	H	L	H	L	M	L	H
Cement	H	L	H	L	H	M	H
Fertiliser	L	H	M	M	H	H	H
Food processing	L/M/H	M/H	M	M	H	H	H
Industrial chemicals	M/H	H	M	M	H	H	H
Leather / tanneries	L/M	H	L	M	H	H	H
Marble/stone crushing	L	M	H	M	L	M	H
Metal & steel	H	H	H	H	H	H	H
Pharmaceuticals	M	H	H	H	H	H	L
Petroleum	H	L	M	M/H	H	M	M
Pulp & paper	H	H	M	M	H	H	L
Textile & garment	H	H	M	L/M	H	H	h

Despite RECP's proven potential, it has still not been mainstreamed in South Asia's different industrial sectors, over two decades after the concept was introduced. Hundreds of SMEs in Bangladesh, India and Pakistan have been directly supported through a growing number of projects over the last two decades (Figure 2), and thousands more were made familiar with RECP through awareness raising, training and engagement with industrial associations. While these efforts often produced results in targeted firms, studies suggest there is still a large potential for efficiency gains in resource-intensive and polluting sectors, with profitable investment opportunities and payback periods often ranging from a few months to 2-3 years. RECP has in most cases not passed the "pilot" stage to achieve sector-wide mainstreaming. The following conclusions can be drawn from South Asia's experience to date, which to a large extent echoes the experience in other regions:

Figure 2: Growing number of RECP projects and initiatives in South Asia



- Key priority sectors have generally been targeted, but in a fragmented manner with successive small-scale projects.
- Projects have often focussed on energy efficiency and "low-hanging fruits", neglecting RECP's holistic dimension and more complex changes that matter both for firm performances and environmental footprint.
- There is no consolidated, easily accessible information about RECP technologies piloted, results achieved through various project, etc. The lack of data makes it more difficult to scale up projects, disseminate technologies and make a convincing business case for other firms.
- Most projects have focussed on identifying direct improvements at the firm-level with many good results. However, progress has been limited by the lack of attention dedicated to improving the external environment for RECP (e.g., capacity building of government agencies, industry associations and private technological and financial service providers; modernization of the policy and regulatory framework; facilitation of RECP financing). Promisingly, some progress on these

broader dimensions has been achieved in recent years in Bangladesh and India, and the province of Punjab in Pakistan has formulated plans to progress in this direction.

Industrial resource use and pollution are complex issues involving different sectoral policies that need to work together, which stakeholders recognize as a weak point in South Asia. Governments need to strengthen cross-departmental cooperation for high-level strategic decision making and lower-level policy and operational work. This is largely lacking in the three countries – only India recently attempted to strengthen coordination, with the MoEFCC in the lead. Adequate resources, staffing and capacities to ensure a coordinating and policy guidance role are needed. Coordination would be more effective with a well-identified central coordinating body with a clear mandate and adequate resources.

While South Asian governments have developed policies linked to RECP, they lack integrated strategies that support sustainable industrial development. In recent years, strategies and policies dealing with industrial development, energy efficiency and environmental management have been adopted at different levels of government. Overall, limited links are made between these different dimensions, which is also likely a reflection of the lack of horizontal coordination previously mentioned. Consolidated strategic frameworks, with credible action plans to achieve their objectives in priority sectors, would be useful to foster a more sustainable pathway for industries. Encouragingly, India has recently made progress to develop its strategic framework for resource efficiency

The institutional framework in Bangladesh, India and Pakistan could be made much more conducive to the greening of industries. Countries that have successfully initiated the greening of their industrial sector have generally (i) involved various key government institutions in this agenda, beyond the ones in charge of environmental protection, (ii) gradually strengthened the capacity of the different institutions to adopt and implement conducive policies on environmental issues and to support industries. Most government agencies in South Asia suffer from shortcomings on both points, with little to no institutionalized capacity to promote the kind of preventive approaches analysed in this report beyond temporary donor-funded projects.

South Asian countries could use a broader range of complementary policy instruments to minimize industrial resource use, waste and pollution. As shown in Table 2, this range is currently limited in Bangladesh, India and Pakistan. Several reasons can explain why firms do not always invest in resource efficiency and cleaner production, even when this could increase profits. Adopting and enforcing appropriate environmental standards can create pressure to this effect but may not be enough. In fact, countries that have been able to green their industrial sector have tended to combine this traditional regulatory approach with other instruments of environmental policy (e.g. market-based, information-based), as well as with a more proactive "green industrial policy" to address various obstacles limiting the adoption of RECP, industrial symbiosis, etc. This need to combine approaches is particularly relevant in developing countries, where industrial sectors are generally made up of numerous small and often informal firms, and where enforcement capacity is low.

Table 2: Comparative assessment of policy instruments for RECP in South Asia

Policy instruments	Bangladesh	India	Pakistan
Strategies and policies			
Strategy and action plan on RECP	No	Yes	No

Related thematic policies (e.g. renewable energy, waste, etc.)	Yes	Yes	Limited
Laws and regulations			
RECP-specific law	No	No	No
Thematic laws and regulations (with RECP elements)	Yes	Yes	Limited
RECP elements in licensing requirements	No	No	No
Product and/or substance bans	Limited	Yes	Unknown
Emissions limits	Yes	Partially	Yes
Production process standards	None	Unknown	None
Minimum product standards	Limited	Limited	Limited
Environmental requirements in zoning policies	Limited	Yes	Limited
RECP provisions in public procurement	Limited	Partially	No
Economic and fiscal instruments			
Fees and fines	Yes	Yes	Yes
Emission charges	Yes	Yes	Limited
Taxes	None	Yes	None
Subsidies for green practices	None	Yes	None
Credit lines for green practices	Limited	Yes	None
Cap and trade schemes	Unknown	Unknown	None
Feed-in tariffs	Unknown	Unknown	Unknown
Tradable permits	Unknown	Unknown	Unknown
Deposit-refund systems	Unknown	Unknown	Unknown
Information-based instruments			
Eco-labels	Limited	Partially	Limited
Environmental Performance Rating and Disclosure scheme	Unknown	Yes	None
RECP-related portals	None	Limited	None
Awareness campaigns with RECP elements	Limited	Limited	Limited
Education and training programmes on RECP	Limited	Limited	Limited
Voluntary agreements			
Reporting initiatives	Limited	Partially	None
Targets on RECP elements	None	None	None
Certification systems	Limited	Yes	None

Source: UNEP/IGES (2015), World Bank RECP baseline assessments (2018)

The policy framework for industries in Bangladesh, India and Pakistan is often lacking in terms of implementation and completeness. Legal and regulatory framework for environmental management are in place in each country but provisions concerning polluting industries have often not been enforced meaningfully to date and industries face little incentive to adopt RECP measures.

The regulatory frameworks also do not foster preventive approaches that improve industrial resource efficiency and reduce pollution and waste. Relevant laws and regulations in the three countries mostly focus on the ‘‘end-of-pipe’’ and on pollutant concentrations, largely ignoring preventive approaches for RECP, waste avoidance and resource recovery, which are considered as voluntary actions by industries. Moreover, these frameworks are focused on ‘‘command and control’’ regulations, which are difficult to enforce when regulating agencies are weak and industries made up of numerous and often informal SMEs. Complementary instruments that could address obstacles to RECP and market failures, including market-based, information-based and voluntary instruments, are still largely lacking.

Several programmes intended to facilitate SMEs' access to finance have already been implemented in South Asia, but still need to prove their effectiveness and increase in number. In Bangladesh several good initiatives have been launched, including SREDA's schemes for energy efficiency and renewable energy, Bangladesh Bank's Green Transformation Fund, and specific schemes for the textile sector. India also has some experience with tailored financing schemes, often mainly energy-focussed. Such schemes have so far been lacking in Pakistan. Even where they exist, financing schemes have tended to be underutilised because of their inadequate tailoring for market needs, financial institutions' lack of familiarity with RECP and of capacity to properly assess technical aspects, and firms' lack of capacity to present bankable projects or bear transaction costs. Existing initiatives nonetheless provide a good basis for further improvement, in particular with regards to schemes' broader scope for RECP, accessibility for SMEs, and incentives and capacity building for financial institutions.

While some capacity to implement RECP has been built in South Asia, it remains insufficient. Introducing and mainstreaming RECP requires awareness and knowledge from key stakeholders, as well as coordinated action between them. As a result of the different projects implemented to date, experience on RECP has been gained and expertise built in the different countries. However, it appeared during stakeholder consultations that many stakeholders still lack in-depth understanding of the concept and that the pool of local experts remains rather limited. Lack of a responsible agency with a proper overview of all RECP activities and of the expertise available in each country, and lack of a stable pool of technical experts contribute to the challenge. Moreover, the availability of RECP technologies varies across countries, sector and type of firms, but often remains a constraint. Finally, Intra-governmental coordination and public-private dialogue are essential for green industrial development but still limited in South Asia.

- **Recommendations**

The following generic interventions, that apply to varying degrees to all three countries, need to be considered to advance RECP in the region (Annex 2 provides country-specific recommendations).

Intervention package 1: Strategies, policies and regulations

- *Establish RECP strategy and institutional coordination mechanism:* To properly guide policy, South Asian governments should establish strategic visions for sustainable industrial development. This could take the form of strategies with short, medium and long-term objectives, sector-specific targets and action plans for key ministries and agencies. The main vehicles to develop and implement these interventions would be the relevant national Ministries in charge of Industry and Environment, and – depending on country structure – state, provincial and/or local governmental agencies, but involvement of other relevant ministries is paramount.
- *Revise laws & regulations:* Stronger regulatory pressure is necessary to push industries to better control pollution and invest in RECP. This requires an updated regulatory framework, including industry-specific emission standards and regulations for industrial resource consumption, waste and resource circularity.
- *Broaden the range of policy instruments used:* Beyond environmental regulations, governments should explore complementary policy instruments that could contribute to RECP mainstreaming

but are often lacking in South Asia. This would in particular imply considering market-based instruments, information-based instruments and voluntary approaches could be leveraged.

Intervention package 2: Private sector engagement and capacity building

Efforts should be made to develop public-private dialogue on RECP and to mainstream the concept within the private sector. Dedicated public-private dialogue platforms could be established to enable regular exchanges between stakeholders, including key public agencies, industry representatives (e.g. Chambers of commerce, industry associations, international retailers), RECP experts, financing institutions. The experience shows that such platforms can play a key role to identify bottlenecks, devise actions plans to remove them and monitor progress. There has been progress of late and some public-private fora have begun to emerge in India and Bangladesh. Moreover, more efforts could be made to raise awareness about RECP's benefits and available technological options, and to showcase experiences and results from international and national projects. International networks on RECP could be tapped into to disseminate knowledge on RECP and exchange experiences.

Intervention package 3: Financing

Adequate financing mechanisms for RECP, building on new green banking guidelines in the three countries, should be developed. Both India and Bangladesh have made some progress in this area, however Pakistan lags behind. Financial instruments could be designed, starting with providing access to existing funds for projects that advocate sustainability issues. However, this requires both improved technical capacity at financial institutions to properly assess the funding proposals and improved capacity of the project proponents to develop bankable projects.

Intervention package 4: Technology

Interventions to develop the availability of and access to RECP technologies are needed. In India, there are already some commercial, non-profit and government institutions providing technologies, capacity building and other support services, but these efforts could be strengthened. In Bangladesh and Pakistan these services are still limited. Some of the key activities could include:

- Vendor development – including awareness and business-to-business connections, especially to address the technology scalability issues
- Activities to stimulate innovation and competitiveness. Strengthening R&D infrastructure for RECP products and services.
- Information and knowledge sharing – technical studies, documentation of good practice, technology transfer, exchange visits, etc.