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Regional priorities for the implementation of the 2030 Agenda for Sustainable Development in Asia and the Pacific

Mainstreaming sustainable development through modelling

Note by the secretariat**

Summary

The recently adopted 2030 Agenda for Sustainable Development is universal and applicable to both developing and developed countries. Because it aims to integrate the economic, social and environmental dimensions of sustainable development, its goals (SDGs) and associated targets are expected to be attained in a cohesive manner. However, in light of their high level of ambition and comprehensiveness, their achievement must take into account differences across countries in capacities and levels of development.

The freedom accorded to governments about how to achieve the universal and interrelated SDGs leads to the question of what is the best way for the governments to implement the 2030 Agenda, keeping in view their unique circumstances, levels of development, and capacities. This note proposes an analytical framework to provide answers to this question, with an application to the case of Pakistan. The framework allows policymakers to think through relevant interactions among different goals and associated targets. It can also simulate and evaluate the benefits of alternative policies and pathways for progress towards the achievement of the SDGs.

The analysis suggests that Pakistan could make most progress in the implementation of the 2030 Agenda by prioritizing progress in areas related to health, education, gender equality and specific infrastructure. The results confirm that planning and prioritization are essential in implementing the 2030 Agenda, and that state agencies as well as policymakers should coordinate their efforts to provide for a clearly defined pathway for progress.

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I. Introduction

1. On 25 September 2015, more than 150 world leaders gathered in New York and adopted the 2030 Agenda for Sustainable Development. This is an agenda of unprecedented scope and significance, which includes 17 Sustainable Development Goals (SDG) and 169 associated targets aimed at ending poverty and hunger, protecting the planet from environment degradation, ensuring that all human beings enjoy prosperous and fulfilling lives, and fostering peaceful, just and inclusive societies. For this purpose, it also calls for strengthening the means of implementation and revitalizing global partnerships.

2. The 2030 Agenda is universal and applicable to both developing and developed countries. Because the SDGs aim to strike a balance among the economic, social and environmental dimensions of sustainable development, they are expected to be attained in an integrated manner. However, in light of their high level of ambition and comprehensiveness, their achievement, as recognized in the 2030 Agenda itself, must take into account differences across countries in capacities and levels of development. Indeed, the agenda states that “*each government will (...) decide how these aspirational and global targets should be incorporated in (their) national planning processes, policies and strategies* (paragraph 55).”

3. The freedom accorded to governments about how to achieve the universal and interrelated SDGs leads to the question of what is the best way for the governments to implement the 2030 Agenda, keeping in view their unique circumstances, levels of development, and capacities. This note proposes an analytical framework to provide answers to this question, with an application to the case of Pakistan. The framework allows policymakers to think through relevant interactions among different goals and associated targets. It can also simulate and evaluate the benefits of alternative policies and pathways for progress towards the achievement of the SDGs. This information can contribute to national deliberations on the design of national plans and strategies for the adaptation of the 2030 Agenda for Sustainable Development to country-specific contexts.

4. The basic premise of this proposed framework is that SDGs comprise a *complex system*. A complex system is in essence a nexus of diverse, multiple and interconnected elements, such that the system as a whole is not equal to the sum of its parts. The framework discussed in this note considers the complex system of SDGs as reflecting a combination of various capacities – such as physical capital, human skills and social strengths along with institutional capabilities – that allow countries to progress towards

attainment of individual goals. Although such capacities are not directly observable, they can be inferred by comparing levels of attainment in a number of indicators associated with each SDG across countries. Furthermore, by focusing on comparing countries with similar capacities, we can obtain country-specific maps of potential pathways for the implementation of the 2030 Agenda that are both feasible and appropriate to their specific capacities.

5. The analysis of the SDG system in this background note is based on economic, social, and environmental data from 169 countries of the world. Using Pakistan as an example, it first conceives a measure of the underlying capacities that Pakistan possesses in achieving SDGs, given the structure of the SDG system and the collective characteristics of all the countries in the sample. After this, an assessment of the preparedness of Pakistan in adapting the SDGs is made, followed by suggestions for pathways for the pursuit of the SDGs based on Pakistan's capacities.

6. The analysis for Pakistan suggests that the country could make most progress in the implementation of the 2030 Agenda by prioritizing progress in indicators related to health, education, gender equality and specific infrastructure. The results confirm that planning and prioritization are essential in implementing the 2030 Agenda, and that state agencies as well as policymakers should coordinate their efforts to provide for a clearly defined pathway for progress. We believe that the proposed framework could be a useful tool for discussions on optimal pathways for the implementation of the 2030 Agenda in other countries in Asia and the Pacific.

II. The SDGs as an integrated system

7. At the time of developing this analytical framework, the Inter-agency and Expert Group on Sustainable Development Goal Indicators (IAEG-SDGs) was still in the process of refining and fine-tuning the indicators that will be used to measure the success of SDG. As such, ESCAP collected data for 82 indicators that capture various aspects of the SDGs and 169 countries based on data availability at the time of writing.¹ Because of the need for data comparability across countries, the data sources are international databases such as World Bank, FAO, UNSD, IEA and others.

8. We construct a graphical representation of the SDG system as a network of the 82 SDG indicators for the case of Pakistan by linking indicators that are closely related to each other.² Figure 1 shows the network of SDG indicators for the case of Pakistan. The white nodes represent

¹ See Cho, Jaebeum, Alberto Isgut and Yusuke Tateno, 2016 (forthcoming), "Pathways for Achieving the Sustainable Development Goals: The case of Pakistan," MPFD Working Paper, ESCAP for the full list of indicators included in the analysis and details on procedure to select indicators included in the analysis.

² We identify indicators that are closely related to each other by calculating the so-called proximity scores of all pairs of indicators with respect to Pakistan. The proximity score of two indicators A and B is high if a country that achieves a high degree of attainment in indicator A compared to Pakistan also achieves a high degree of attainment in indicator B compared to Pakistan. The computation of the proximity score of indicators A and B is based on the probability that a country that has a higher level of attainment in indicator A relative to a reference country, conditional on the fact that the country also has a higher level of attainment in indicator B. Once the proximity scores are calculated for all pairs of SDG indicators, the network is visualized by forming a spanning tree that connects each indicator with its most proximal partner, and adding links above a certain proximity value. See Cho et al., 2016, for details.

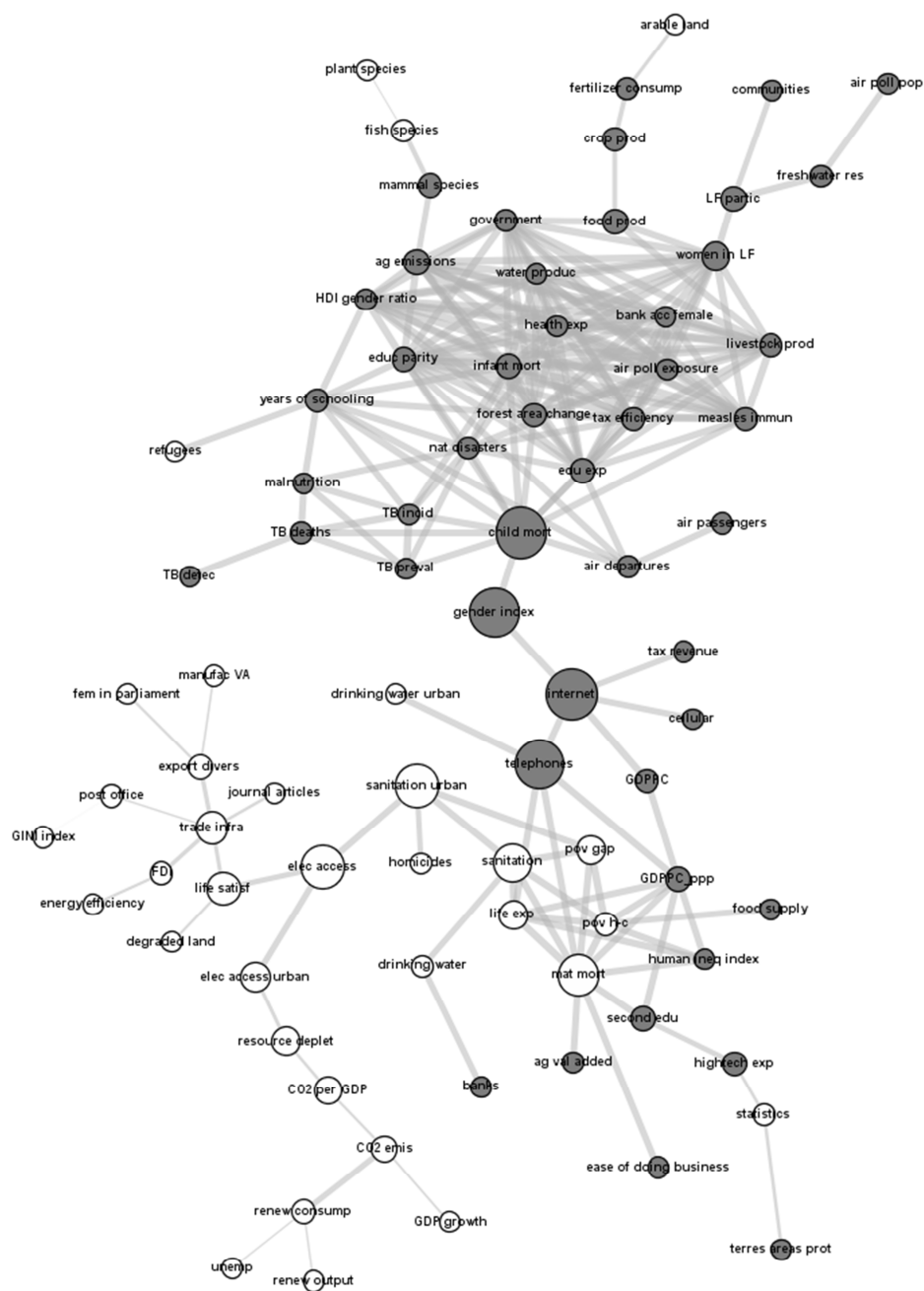
indicators in which Pakistan is doing better than the average of lower middle-income countries, while the grey nodes are for those in which Pakistan is doing poorly relative to the average of lower middle-income countries. The thickness of the lines connecting two nodes represents the proximity of those two indicators, and the size of the nodes represents their importance in connecting all the other nodes in the system.³

9. The figure reveals that the SDG system of Pakistan is divided into two different areas. The top portion of the network is densely connected, meaning that the indicators in this part of the graph are highly related to each other. This area of the network mainly contains indicators related to gender, health, hunger, and education (SDGs 2 to 5). Most of the nodes in this area are grey, meaning that Pakistan is on average doing worse than other lower middle-income countries. The bottom area of the network mainly includes indicators related to the environment, infrastructure, and the economy, in which Pakistan is doing better, on average, than other lower middle-income countries.

10. The large nodes that are located at the center of the SDG system of Pakistan – telecommunications (telephones and internet), gender, and child mortality – can be considered as bottlenecks because they connect the otherwise disconnected top and bottom portions of the network. The experience of lower middle-income countries, on which the network for Pakistan is constructed, suggests that these four key indicators should be a priority for Pakistan to improve its attainment across its areas of weakness.

³ In technical terms this is called the betweenness centrality of a node. The betweenness centrality of node A is defined as the number of shortest paths from all nodes in the network to all other nodes that pass through node A.

Figure 1
The SDG system of Pakistan⁴



⁴ *Source:* ESCAP. *Notes:* The white nodes are the indicators in which Pakistan is doing better than the lower middle-income country average. Nodes are sized based on their importance as bottlenecks (i.e. how important they are as middle links for Pakistan to progress towards better attainment in other indicators).

11. The graph suggests that access to telephones and internet are the first two bottlenecks that should be addressed. This makes intuitive sense because better telecommunication networks can enhance access to information, education and business opportunities for the population at large. These opportunities, in turn, could contribute to improving reproductive health and women's access to education and jobs, thus improving Pakistan's attainment in the gender index, the third bottleneck in the graph.⁵ Furthermore, there is much evidence in the literature that women's education and reproductive health are positively related to child mortality, the fourth bottleneck.⁶ Addressing this fourth bottleneck would, according to the network analysis, facilitate the achievement of higher levels of attainment in the other indicators included in the dense upper portion of the network, which relate to hunger, health, and gender equality.

III. Estimating capacities for the mainstreaming and implementation of the 2030 Agenda

12. As highlighted above, countries must overcome their bottlenecks in order to be able to achieve higher levels of attainment in key SDG indicators. Making progress in the attainment of SDG indicators, however, requires the availability of a number of resources, including skilled workforce, administrative efficiency, effective governance, and others that are difficult to quantify. We refer to these hard to measure resources as 'capacities needed to make progress towards the SDG', or SDG capacities for short. This term is used in a similar manner to 'productive capacities', which was the main theme of the *Asia-Pacific Countries with Special Needs Development Report* of 2015.⁷

13. A country's SDG capacities can be thought of as Lego building blocks placed in a bucket. As much as building a more complex Lego model requires specific building blocks, achieving a high degree of attainment in a specific SDG requires countries to possess specific SDG capacities.⁸ Because the implementation of the 2030 Agenda will be tracked by the degree of progress of countries in a number of SDG indicators, we can think of it as analogous to a process of enhancement of SDG capacities.

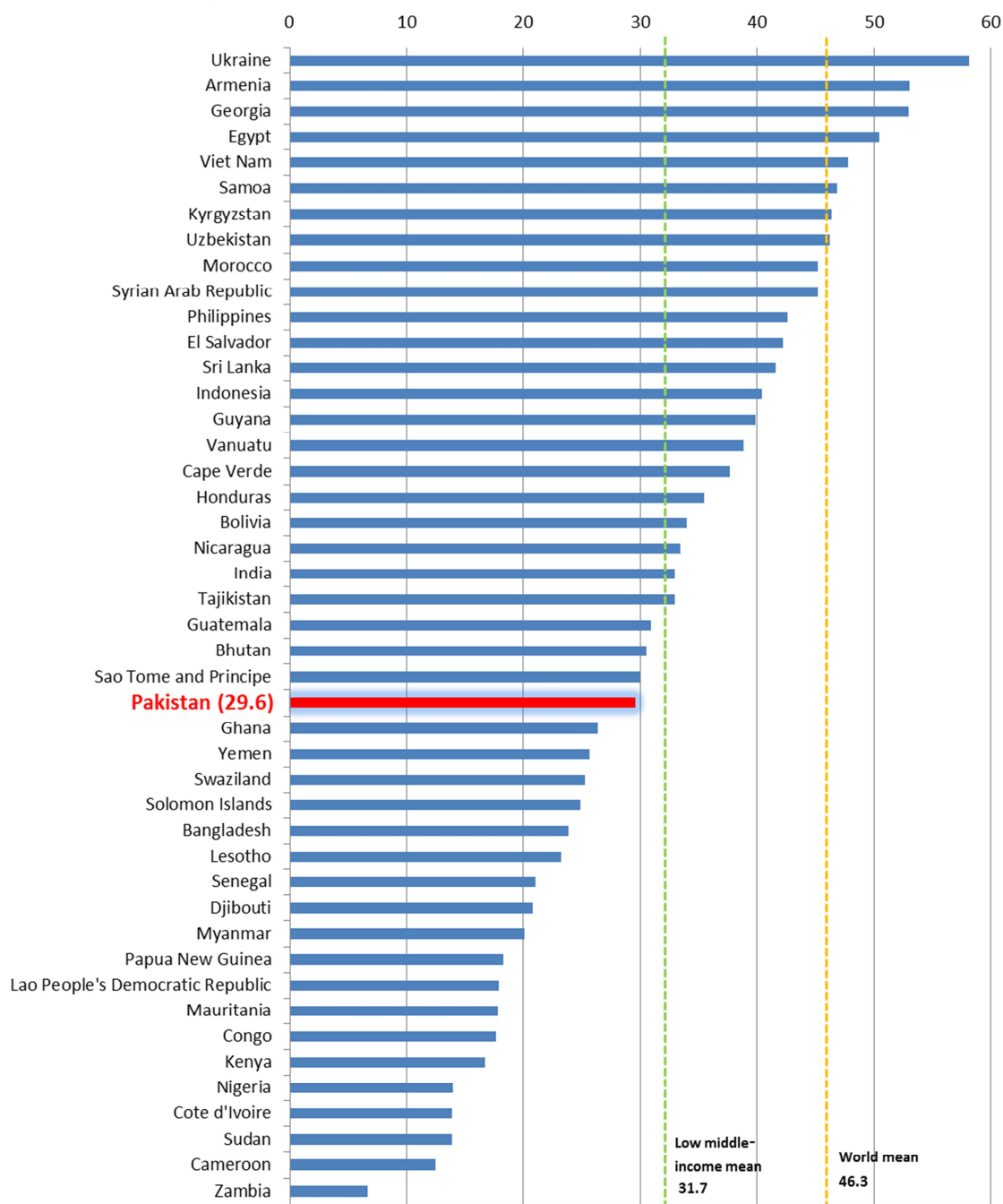
⁵ The gender index depicted in the graph is a composite measure developed UNDP that measures gender inequalities in three important aspects of human development—reproductive health, measured by maternal mortality ratio and adolescent birth rates; empowerment, measured by proportion of parliamentary seats occupied by females and proportion of adult females and males aged 25 years and older with at least some secondary education; and economic status, expressed as labour market participation and measured by labour force participation rate of female and male populations aged 15 years and older.

⁶ See e.g. John Ward, Bernice Lee, Simon Baptist and Helen Jackson, 2010, *Evidence for Action: Gender Equality and Economic Growth*, Chatham House.

⁷ UNCTAD's *Least Developed Countries Report 2006* defined productive capacities as "productive resources, entrepreneurial capabilities and production linkages which together determine the capacity of a country to produce goods and services and enable it to grow and develop. See the *Asia-Pacific Countries with Special Needs Development Report 2015*, p. 68 for additional definitions.

⁸ See Hidalgo, César A., and Ricardo Hausmann, 2009, "The Building Blocks of Economic Complexity," *Proceedings of the National Academy of Sciences*, Vol. 106(26), pp. 10570–75.

Figure 2
SDG capacities of lower middle-income countries⁹



⁹ Source: ESCAP. Note: SDG capacities calculated using the Method of Reflections. Cho. Jaebeum, Alberto Isgut and Yusuke Tateno, 2016 (forthcoming), "Pathways for Achieving the Sustainable Development Goals: The case of Pakistan," MPFD Working Paper, ESCAP, for details.

14. In order to create a measure of the unobservable SDG capacities of a country, we utilize the Method of Reflections pioneered by Hidalgo and Hausmann, which is based on a comparison of the degree of attainment of such country in all the SDG indicators vis-a-vis all the other countries.¹⁰ If that country is achieving a higher attainment in a particular indicator relative to the other countries, then it is considered to have specific capacities associated with that indicator. Conversely, if the country is struggling in a particular indicator compared to other countries, this suggests that it does not yet have the required capacities needed to progress towards better attainment in that indicator. Using this method, each indicator is also weighted by its complexity, where overall higher levels of attainment for a particular indicator across countries suggest that that indicator is less complex, and thus is easier to improve attainment upon.

15. Figure 2 shows the aggregate SDG capacities for Pakistan and the other lower middle-income countries. On a scale of 0 to 100, Pakistan's capacity is around 30, which is slightly below but roughly on par with the lower middle-income country average. The figure shows that countries such as India, Tajikistan, and Bhutan have roughly the same levels of SDG capacities as Pakistan. Compared to the rest of the world, Pakistan's capacity level is around two thirds the world average.

16. The capacities that a country possesses are to some degree correlated with both income levels (measured as GNI per capita) and the Human Development Index (HDI), as shown in Figures 3 and 4. However, our measure of capacity is more correlated with HDI than income, which suggests that capacity levels represent a diverse set of socioeconomic capacities. It can be seen on these figures that Pakistan's level of capacity is slightly higher than the predicted value, given its levels of income per capita and HDI. This is both encouraging and discouraging. Given Pakistan's level of income and HDI, its capacities are higher than expected, which suggests that Pakistan has more room to progress towards attaining the SDGs relative to countries with similar levels of income or human development. However, this also suggests that Pakistan may be able to achieve higher levels of income or human development given its level of capacity, which implies that Pakistan's capacities are currently under-utilized.

¹⁰ See Hidalgo and Hausmann, 2009.

Figure 3
SDG capacities vs. GNI per capita in lower middle-income countries¹¹

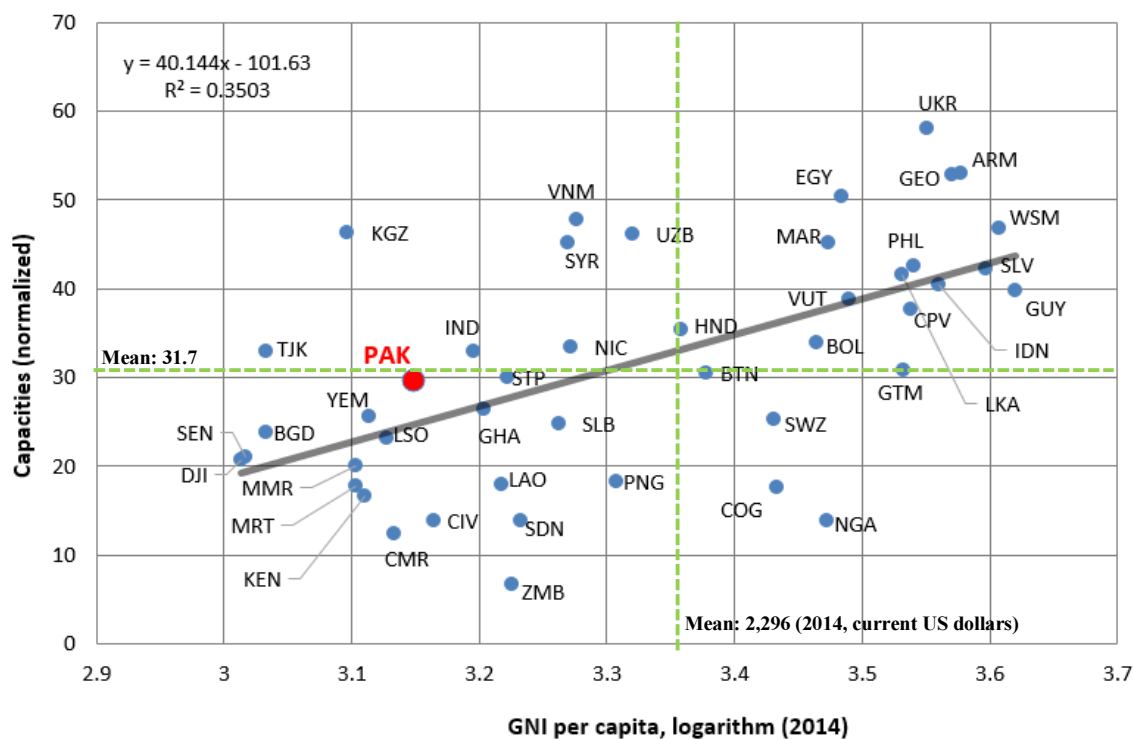
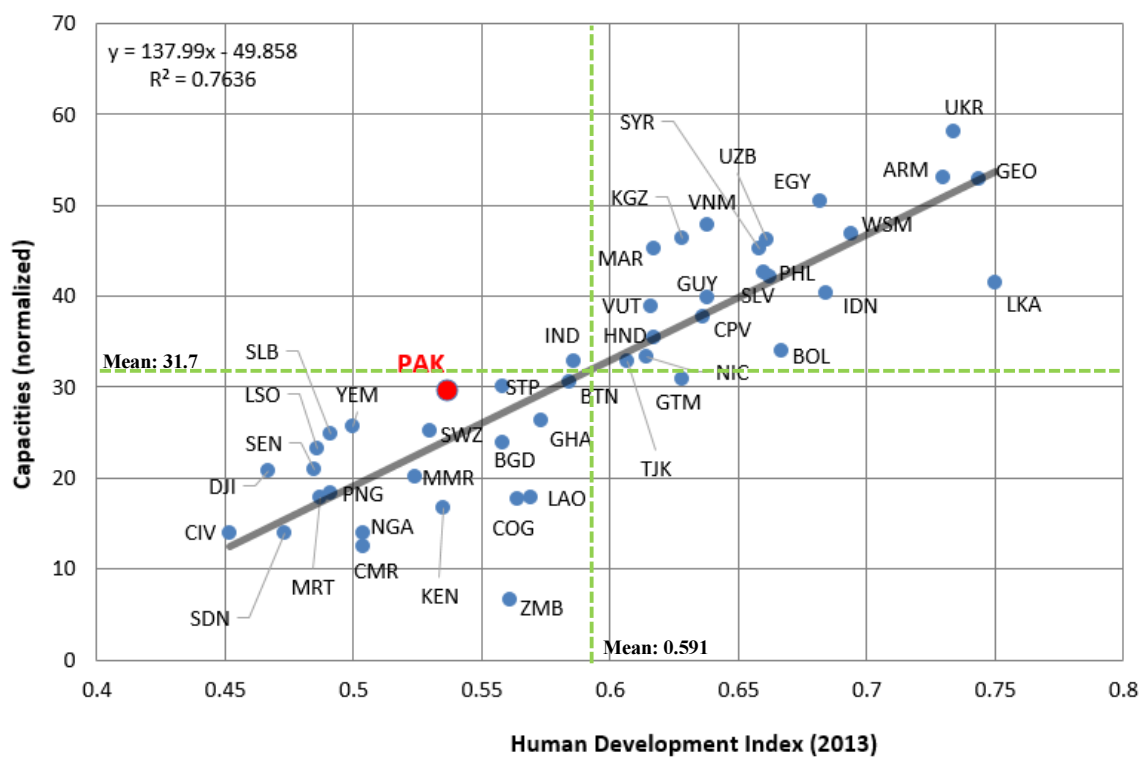


Figure 4
SDG capacities vs. HDI in lower middle-income countries¹²



¹¹ Source: ESCAP.

¹² Source: ESCAP.

IV. Finding an optimal pathway for progress

17. The graphical representation of the SDG system of Pakistan is suggestive of possible pathways for progress in the implementation of the 2030 Agenda and highlights the importance of tackling bottlenecks to improve the attainment of SDGs in which Pakistan is underperforming compared to other lower middle-income countries. In this section we discuss the results of an optimization exercise by which Pakistan chooses to enhance the attainment of those SDG indicators that contribute the most to increasing the country's SDG capacities. Technical details are available in a companion working paper.¹³

18. In this exercise, the peers to which Pakistan's performance is compared consists of countries that have SDG capacities similar to Pakistan's, as well as some upper middle-income countries group.¹⁴ Pakistan's peers include: Algeria, Bangladesh, Bhutan, Bolivia, Botswana, Cape Verde, Comoros, Equatorial Guinea, Gabon, Gambia, Ghana, Guatemala, Guyana, Honduras, India, Indonesia, Iraq, Lesotho, Mongolia, Namibia, Nicaragua, Paraguay, Sao Tome, Solomon Islands, Sri Lanka, Swaziland, Tajikistan, Turkmenistan, Vanuatu and Yemen.

19. Table 1 lays out suggested priority areas for Pakistan resulting from the optimization exercise. Fourteen indicators from four different SDGs are identified as top priority areas for Pakistan. Five out of fourteen are related to SDG 5 on gender equality and empowerment of women and girls, followed by four indicators for SDG 3 on health and well-being, three on infrastructure (SDG 9) and two on education (SDG 4).

20. Several observations can be drawn from these results. First, the top-priority areas are concentrated in the four SDGs: health, education, gender and infrastructure. Second, many of the SDG indicators in the top priority areas are interlinked each other. For instance, the Gender Parity Index on primary level school enrolment is generally highly associated with the two indicators under SDG 4 on education. Third, in contrast to the first point, the next priority areas are all indicator-specific rather than being focused on some particular SDGs.

21. Arguably, the most striking result here is that four indicators of the top priority areas coincide with the bottleneck nodes shown in figure 1, confirming the critical importance of these four factors for Pakistan in progressing towards the achievement of SDGs.

¹³ Cho, Jaebeum, Alberto Isgut and Yusuke Tateno, 2016 (forthcoming), "Pathways for Achieving the Sustainable Development Goals: The case of Pakistan," MPFD Working Paper, ESCAP.

¹⁴ We include some of the upper middle-income countries in because of the aspiration for the country to become a member of this group expressed in its long-term national development plan, Vision 2025 (Pillar II, Goal 8).

Table 1
Suggested areas of priority for Pakistan¹⁵

	Indicator	SDG
Top priority areas	Children 1 year old immunized against measles, percentage	SDG 3: Good health
	Health expenditure, public (% of GDP)	
	Children under five mortality rate per 1,000 live births	
	Tuberculosis prevalence rate per 100,000 population (mid-point)	
	Government expenditure on education, total (% of GDP)	SDG 4: Quality education
	UNDP Education index	
	UNDP Gender inequality index	SDG 5: Gender equality
	Account at a financial institution, female (% age 15+)	
	Female to male ratio of HDI	
	Gender Parity Index on primary level school enrolment	
	Labour force participation rate, female (% of female population ages 15-64)	SDG 9: Innovation and infrastructure
	Mobile-cellular subscriptions per 100 inhabitants	
	Internet users per 100 inhabitants	
	High-technology exports (% of manufactured exports)	
Next priority areas	Population undernourished, percentage	SDG 2: No hunger
	Food production index (2004-2006 = 100)	
	Labour force participation rate, total (% of total population ages 15-64)	SDG 8: Good jobs and economic growth
	Coefficient of human inequality	SDG 10: Reduced inequalities
	PM2.5 air pollution, mean annual exposure (micrograms per cubic meter)	SDG 12: Responsible consumption
	Deaths from natural disasters / (occurrences * population density)	SDG 13: Climate action
	Emissions of methane and nitrous oxide produced from agricultural activities (Gigagrams)	
	Percent change in forest area (1990-2011)	SDG 15: Life on land
	Satisfaction with efforts to deal with the poor / Satisfaction with actions to preserve the environment / Trust in national government	SDG 16: Peace and Justice
	Satisfaction with local labour market / Trust in other people / Satisfaction with community	
	Time to prepare and pay taxes (hours)	SDG 17: Partnerships for the goals

¹⁵ Source: ESCAP.

V. Analysing alternative scenarios

22. The optimization exercise is complemented by an analysis of alternative scenarios. One alternative scenario (scenario 2) focuses on the implementation of Vision 2025, Pakistan's national development plan, by restricting the choice of SDG indicators to those that are covered by Vision 2025. In this scenario, we exclude some indicators associated with gender equality (SDG 5), and all the indicators associated with sustainable cities and communities (SDG 11), sustainable consumption and production (SDG 12), climate change (SDG 13), oceans (SDG 14) and terrestrial ecosystems (SDG 15).¹⁶ The other alternative scenario (scenario 3) we consider is a randomized pathway in which progress is made in an arbitrary order. This scenario is extreme and unrealistic, but it tries to mimic the situation where there is absolutely no focused area or policy coordination among various government institutions.

23. The results of the three scenarios reveal that the pace of progress in improving SDG indicators would be substantially slow if there is no clear policy target area (scenario 3). With the randomized pathway, Pakistan can achieve on average only 21% of what they would have achieved under the model-proposed optimal pathway. If policies are targeted at the areas of focus of the Vision 2025, with priorities given to health, education and infrastructure (scenario 2), then Pakistan will be able to achieve 79% of what they would achieve under the optimal pathway.

24. Finally, based on the results of the three scenarios, we forecast income levels and HDI under the different scenarios to compare Pakistan's position in future under different development strategies. This is done by first calculating the new capacity level for Pakistan under different scenarios, and predicting GNIPC and HDI using this new capacity level.

25. From Figure 5, it can be seen that the projected GNI per capita for Pakistan under scenario 1 (the optimal pathway) is much higher than the other scenarios, while scenario 2 (Vision 2025) does better than scenario 3 (the random pathway) but not as well as scenario 1. Our calculations suggest that Pakistan will be able to cross the upper middle-income threshold (at \$4,126 for 2016) by the year 2026 when following the optimal pathway for progress. The other two scenarios are unable to ascend Pakistan to upper middle-income country status by 2028, the last year in our projections, although the pathway under Vision 2025 does come closer than the no-policy-coordination pathway.

26. When looking at the forecast for HDI using our capacity index in Figure 6, it can again be seen that the optimal pathway is superior to the other two scenarios, crossing the lower middle-income country average of 0.591 as early as 2017. The increase in HDI under scenario 2 is even less than the HDI trend line calculated from earlier data points all the way up to around 2026, and under scenario 3 HDI fails to ever cross the trend line. Since HDI is a composite measure that takes into account health, education, and income aspects, it is understandable that the optimal pathway does much better than the other two scenarios, for it includes improvements in social areas (such as gender, education, and health) as well as improvements in the environment, which would have high spillover effects on aspects covered by HDI.

¹⁶ While gender issues are present in Pillar 1 of Vision 2025, only 2 specific indicators (primary and secondary education parity and workforce participation) are included in this development plan.

Figure 5
Forecasts of GNIPC by scenario¹⁷

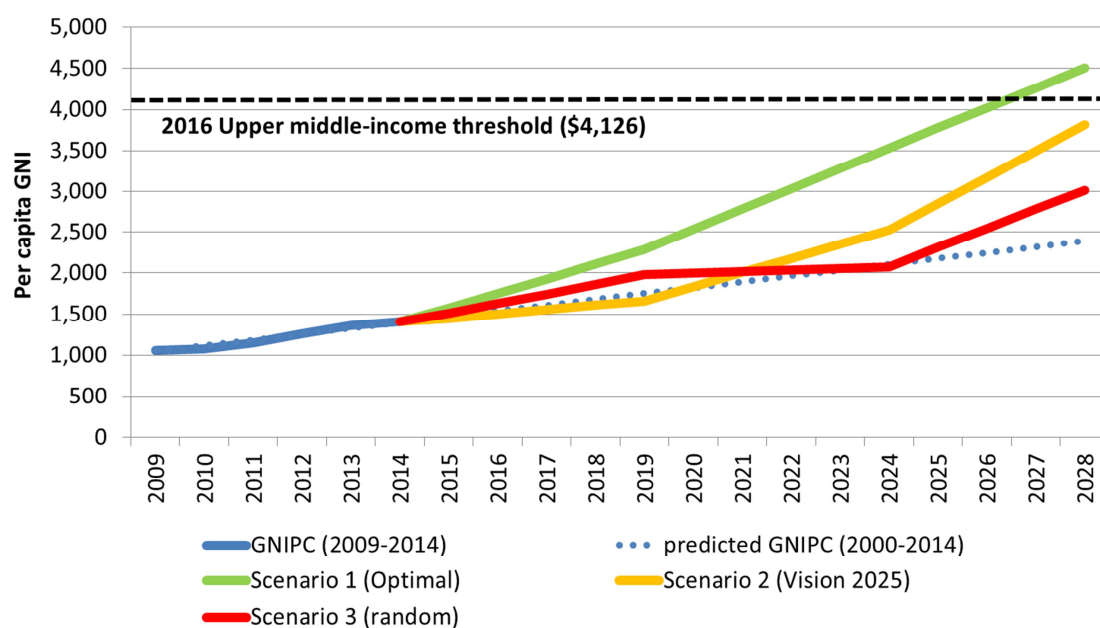
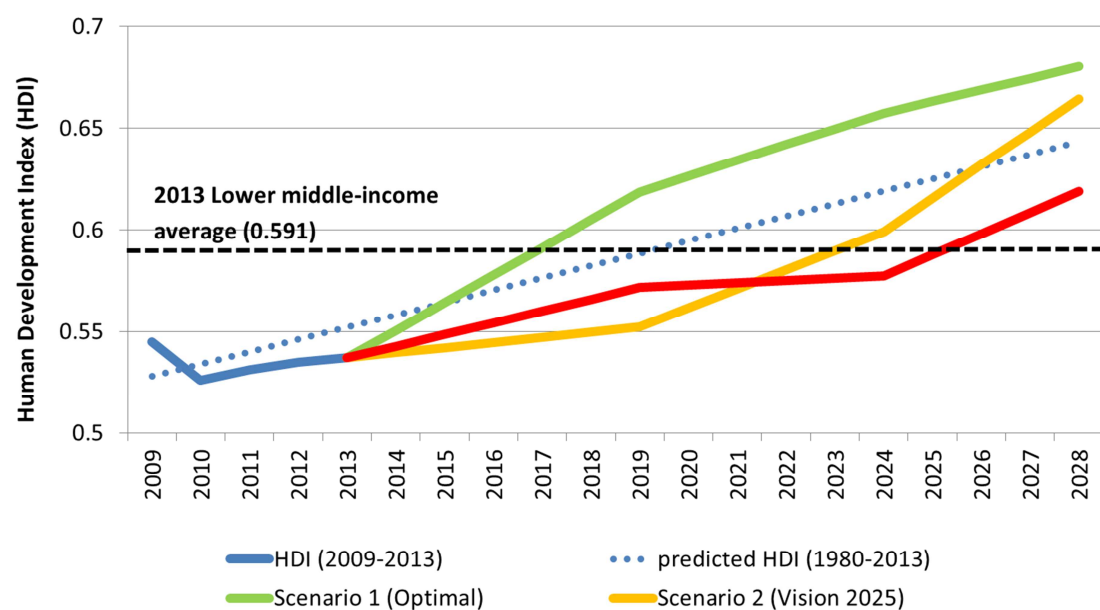


Figure 6
Forecasts of Human Development Index (HDI) by scenario¹⁸



¹⁷ Source: ESCAP.

¹⁸ Source: ESCAP.

VI. Conclusions

27. The SDGs included in the 2030 Agenda for Sustainable Development are a set of ambitious and holistic goals that encompass many different aspects of the economic, social and environmental development of countries. This background note has attempted to offer a rapid assessment technique for identifying starting points for national dialogue on strategic responses to the 2030 Agenda. In the specific application of this technique to the case of Pakistan, the three main conclusions of the analysis are the following:

a. Planning and prioritization are essential for progress towards sustainable development since the expected outcome from randomized policies are strictly inferior, justifying the need for policy coordination across different state agencies as well as across different levels of governments.

b. Vision 2025 is expected to contribute to some extent to the progress towards inclusive and sustainable development if the priorities are placed on health, education and infrastructure.

c. For the areas that are not extensively covered by Vision 2025, especially those related to gender equality and empowerment of women and girls, an appropriate framework as well as various support measures are crucial to ensure that no one will be left behind, which is the key theme of Vision 2025.

28. The approach used in this assessment can be refined in the near future in several ways. For instance, the indicators and data sources used in this analysis may be replaced with the official set of SDG indicators as soon as they are finalized. The use of the official SDG indicators will provide more clarity for identification of the achievement of SDGs. Regional cooperation can also enhance this approach by further integrating and tailoring the specific needs and capacities of the region. ESCAP is currently working with the member States to develop a SDGs-consistent modelling framework, which was initiated with the Workshop on Macroeconomic Modelling in Asia and the Pacific in December 2015. In the future, ESCAP is planning to expand the scope of modelling techniques to include all three pillars of the SDGs in follow-up workshops.
