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**Special Body on Least Developed, Landlocked Developing
and Pacific Island Developing Countries: Asia-Pacific
Countries with Special Needs Development Report 2016**

Supporting the achievement of the Sustainable Development Goals by countries with special needs in Asia and the Pacific

Note by the secretariat[**]

Summary

In an acknowledgement of its high level of ambition and comprehensiveness, the 2030 Agenda for Sustainable Development recognizes that differences between countries' capacities and levels of development must be taken into account in its implementation. To that end, it states that each Government will decide how the aspirational and global targets should be incorporated into national planning processes, policies and strategies. The freedom accorded to Governments on how to achieve the universal and indivisible Sustainable Development Goals leads to the question of what is the best way for countries to adapt the 2030 Agenda to their unique circumstances.

In the present document, which is based on the *Asia-Pacific Countries with Special Needs Development Report 2016: Adapting the 2030 Agenda for Sustainable Development at the National Level*, ways are discussed to address the challenges for achieving the Sustainable Development Goals in Asia-Pacific countries with special needs: least developed countries, landlocked developing countries and small island developing States. For that purpose, a unique analytical framework is proposed, based on cutting-edge methods from complexity science coupled with economic analyses, to guide countries on the prioritization and sequencing of attainment of the Sustainable Development Goals in the most effective manner. The framework allows for the identification of synergies, trade-offs and bottlenecks in attaining the various Goals. The document illustrates the functioning of the framework in three Asia-Pacific countries with special needs: Bangladesh, Kazakhstan and Fiji.

The Commission may wish to consider the analysis and recommendations contained in this document and provide its comments and guidance to further facilitate the adaptation of the 2030 Agenda for Sustainable Development in Asia-Pacific countries with special needs.

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[*]   E/ESCAP/72/L.1.

[**]   The present document was submitted late owing to the need to accurately reflect the contents of *the Asia-Pacific Countries with Special Needs Development Report 2016: Adapting the 2030 Agenda for Sustainable Development at the National Level* (United Nations publication, Sales No. E.16.II.F.11).

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Contents

I.   Introduction

1.   The 2030 Agenda for Sustainable Development is an ambitious and holistic agenda for development that encompasses a broad spectrum of economic, social and environmental issues. Building upon the Millennium Development Goals, the 2030 Agenda includes a more diverse and comprehensive set of aspirational goals applicable to all countries, whether developing or developed. However, unlike the Millennium Development Goals, the specific targets for the Sustainable Development Goals rarely include measurable outcomes, making their implementation more amenable to adaptation to country-specific circumstances, capacities and aspirations. While this flexibility is highly desirable, it also demands a deeper level of stakeholder engagement and country ownership in deciding which areas of the 2030 Agenda can be most productively prioritized and effectively implemented, taking into account the unique level of development, capacities and comparative strengths of each country.

2.   This is a difficult task because the attainment of the Goals and targets of the 2030 Agenda are characterized by interdependence, including synergies and trade-offs. For example, there seems to be a close relationship between Sustainable Development Goals 1, 2, 3 and 8.[1] Devising policies that move forward the 2030 Agenda in these four areas in a holistic and coordinated way could take advantage of potential synergies among them, resulting in much more effective implementation. On the other hand, a popular view holds that there is a trade-off between Goal 8 and Goals 11-15 related to environmental sustainability.[2] Such a trade-off needs to be taken

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[1]   Goal 1 (End poverty in all its forms everywhere); Goal 2 (End hunger, achieve food security and improved nutrition and promote sustainable agriculture); Goal 3 (Ensure healthy lives and promote well-being for all at all ages); and Goal 8 (Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all).

[2]   Goal 11 (Make cities and human settlements inclusive, safe, resilient and sustainable); Goal 12 (Ensure sustainable consumption and production patterns); Goal 13 (Take urgent action to combat climate change and its impacts); Goal 14 (Conserve and sustainably use the oceans, seas and marine resources for sustainable development); and Goal 15 (Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss).

into account for balanced and effective implementation of the Goals associated with the three pillars of sustainable development. This suggests that a clear understanding of the interdependence, synergies and trade-offs across the Goals and targets is essential for the successful implementation of the 2030 Agenda.[3]

3.   Interdependence among the Goals and related targets is not new. It has been recognized by the United Nations, political leaders and scientists in academia for a long time.[4] For example, at the United Nations Conference on the Human Environment (Stockholm Conference) in 1972, the Indian Prime Minister, Indira Gandhi, advocated an integrated approach to development: "The population explosion, poverty, ignorance and disease, the pollution of our surroundings, the stockpiling of nuclear weapons and biological and chemical agents of destruction are all parts of a vicious circle. Each is important and urgent but dealing with them one by one would be wasted effort".[5] Similarly, the definition by the World Commission on Environment and Development of sustainable development as development that meets the needs of the present without compromising the ability of future generations to meet their own needs underlies an integrated view of development in which issues such as economic growth, intra- and intergenerational equity and environmental sustainability influence and reinforce each other and evolve in tandem.

4.   The purpose of this document is to propose an analytical framework to facilitate the understanding of complementarities, synergies and trade-offs across Goals and their targets at the national level, taking into account each country's unique level of development, capacities and structural characteristics. The framework allows for the identification of optimal strategies for implementation of the Goals, including specific recommendations for the prioritization and sequencing necessary to achieve each one.

5.   The framework is based on the premise that it is possible to conceptualize the Goals as a complex system composed of 174 countries with varying degrees of attainment of 82 indicators representative of the 17 Goals and their associated targets.[6] By allowing a systematic evaluation of the benefits of alternative policies and pathways for progress towards the achievement of the Goals, it is expected that the proposed framework will contribute to deliberations on the design of plans and strategies for the adaptation of the 2030 Agenda to national contexts.

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[3]   United Nations System Task Team on the Post-2015 United Nations Development Agenda, "Countries with special needs: thematic think piece", May 2012. Available from http://unohrlls.org/UserFiles/1_countries_with_special_needs.pdf.

[4]   International Council for Science and the International Social Science Council, *Review of Targets for the Sustainable Development Goals: The Science Perspective* (Paris, 2015).

[5]   Department of Economic and Social Affairs, *Global Sustainable Development Report: 2015 Edition* (advance unedited version). Available from https://sustainabledevelopment.un.org/content/documents/1758GSDR%202015%20Advance%20Unedited%20Version.pdf.

[6]   For the full list of indicators and the detailed selection procedure, see annex III of *Asia-Pacific Countries with Special Needs Development Report 2016: Adapting the 2030 Agenda for Sustainable Development at the National Level* (United Nations publication, Sales No. E.16.II.F.11).

II. The Sustainable Development Goals as an integrated system

6.   An effective way to facilitate the understanding of the interdependence, synergies and trade-offs across the Goals and targets of the 2030 Agenda at the national level is to view the set of Goals and countries as a complex system. In essence, a complex system is a nexus of diverse, multiple interconnected elements in which the whole is not equal to the sum of the parts.[7] Academic researchers from various disciplines have been increasingly using complex systems for the analysis of economic phenomena and sustainable development.[8] The Economic and Social Commission for Asia and the Pacific (ESCAP) has conducted research on this topic with regard to measuring productive capacities in the Asia-Pacific region, where such capacities are measured using information on interlinkages among products and countries.[9]

7.   In this document, the Sustainable Development Goals system is conceptualized as a network consisting of: (a) the 82 indicators relevant to each of the Goals; (b) the 174 countries; and (c) the linkages among and between countries and indicators. The following two subsections describe the Sustainable Development Goals system.

A. Network of indicators

8.   The advantage of viewing the indicators related to the Goals as a network is that it makes it clear how they are interlinked, revealing their synergies and trade-offs. The information provided by an indicator network can allow policymakers to devise plans of action that take advantage of the spillovers that are present among the indicators, while identifying potential trade-offs that need to be reconciled. The indicator network also allows for the identification of bottlenecks that act as barriers to the attainment of the broader 2030 Agenda.[10]

9.   The network of indicators suggests a clear core-periphery structure, with indicators related to health, hunger, infrastructure and poverty occupying a prominent space within the densely connected core. Life expectancy, infant mortality, food supply and agriculture value added are at the very centre of this core, since they represent essential needs that form the basis for higher attainment in other indicators. The poverty headcount, poverty gap ratio, malnutrition, maternal and child mortality and years of schooling are also central for similar reasons. Infrastructure indicators regarding telephone, cellular and Internet subscriptions are also relatively central within this core, consistent with the new institutional economics

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[7]   Herbert A. Simon, "The architecture of complexity", in *Facets of Systems Science*, vol. 7, George J. Klir, ed. (New York, Springer Science+Business Media, 1991).

[8]   See, for example, César A. Hidalgo and Ricardo Hausmann, "The building blocks of economic complexity", *Proceedings of the National Academy of Sciences of the United States of America*, vol. 106, No. 26 (June 2009), pp. 10570-10575.

[9]   See *Asia-Pacific Countries with Special Needs Development Report 2015: Building Productive Capacities to Overcome Structural Challenges* (United Nations publication, Sales No. E.15.II.F.9). See also David Le Blanc, "Towards integration at last? The sustainable development goals as a network of targets", Department of Economic and Social Affairs Working Paper, No. 141, ST/ESA/2015/DWP/141 (March 2015).

[10]   For further details on this analysis, see figure 3.2 of *Asia-Pacific Countries with Special Needs Development Report 2016*.

viewpoint that facilitating information exchange is important to transforming the political economy of a society, as it results in lower transaction costs, the alleviation of information asymmetries and thus more sustainable socioeconomic development.[11]

10.   Overall, the network representation for Asia-Pacific countries with special needs shows a dense core of highly interrelated socioeconomic indicators and a periphery that includes a number of environmental indicators. The representation shows that these countries have relatively low levels of attainment in a number of indicators that are both in the core and highly connected to other indicators, suggesting that implementing policies to improve the attainment of such indicators could have positive spillover effects and facilitate the attainment of other core indicators.

11.   However, the representation also shows that a number of indicators related to environmental sustainability are in the periphery of the network. Because of their lower degree of connection to the socioeconomic indicators at the core of the network, the representation suggests that their attainment is less likely to benefit from positive spillover effects, further suggesting the existence of trade-offs between the achievement of the socioeconomic and environmental pillars of sustainable development.

B.   Network of countries

12.   Countries can be linked together in a network too, where the links are representative of how similar two countries are in attainment across the 82 indicators included in the analysis.[12]

13.   Countries belonging to each group of Asia-Pacific countries with special needs – least developed countries, landlocked developing countries and small island developing States – tend to be located close to each other in the network, suggesting that they have similar levels of attainment in the indicators. Eight of the nine least developed countries for which data are available (Bangladesh, Bhutan, Cambodia, the Lao People's Democratic Republic, Myanmar, Nepal, Solomon Islands and Vanuatu) are, in fact, located next to each other. The other least developed country, Afghanistan, is located close to least developed countries from other regions, such as Sudan and Haiti.

14.   Of the five small island developing States in the database, four (Fiji, Samoa, Tonga and Maldives) are clustered close to each other. The fifth, Papua New Guinea, is located further away and close to the Asia-Pacific least developed countries. The Asian landlocked developing countries are dispersed into three small clusters: (a) Armenia, Turkmenistan and Uzbekistan are located close to the Asia-Pacific small island developing States; (b) Mongolia and Tajikistan are close to a number of Asian developing countries; and (c) Azerbaijan and Kazakhstan are located close to countries such as Bahrain, Brunei Darussalam, Qatar and the Russian Federation, which are all oil-exporting countries.

15.   The network of countries suggests that the region's least developed countries are a homogeneous group with regard to their attainment across the 82 indicators included in the analysis. Their similarities as least developed

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[11] See Ronald Coase, "The new institutional economics", *The American Economic Review*, vol. 88, No. 2 (May 1998), pp. 72-74.

[12] For further details on this analysis, see figure 3.3 of *Asia-Pacific Countries with Special Needs Development Report 2016*.

countries are more important than possible differences associated with geographic characteristics such as being landlocked or a small island developing State. These observations reinforce the need for particular attention from the international community in supporting implementation of the 2030 Agenda in least developed countries.

III.   Capacities to implement the Sustainable Development Goals

16.   The attainment of the Goals requires countries to have specific capacities for effective implementation of socioeconomic and environmental policies, capacities which are very difficult, if not impossible, to directly observe and measure. They could include a Government's capacities to design and implement policies, as well as capacities in the population at large to contribute to the attainment of the Goals. In this document – in a similar fashion to *Asia-Pacific Countries with Special Needs Development Report 2015* in the case of productive capacities – the capacities of a country to implement the Goals are measured using information provided by the Sustainable Development Goals system.

17.   Using the 82 indicators included in the analysis, the simplest way to construct a measure of the capacities of a particular country to implement the Goals is to calculate the average level of attainment across all the indicators. However, this measure is unsatisfactory because it does not take into consideration the fact that different indicators are characterized by different degrees of complexity. For instance, it is reasonable to assume that it would take considerably more resources for a country to increase its number of articles published in scientific and technical journals than to increase the number of users of mobile phones.

18.   It is assumed that the degree of complexity of an indicator is inversely related to the number of countries that have high attainment in it; that is, if many countries are doing well in a particular indicator, its complexity is assumed to be lower. Thus, a more accurate measure of the capacities of a country to implement the Goals is a weighted average of the levels of attainment in the indicators, using each indicator's complexity as weights. As shown in annex III of *Asia-Pacific Countries with Special Needs Development Report 2016: Adapting the 2030 Agenda for Sustainable Development at the National Level*, the measurement of capacities to implement the Goals can be further refined using the method of reflections. The more refined measures of capacities are higher if a country is doing well in indicators with which other countries are struggling, since this suggests that the country has unique capacities that others do not.

19.   Figure I shows the capacities of the Asia-Pacific countries with special needs to implement the Goals. It shows that four small island developing States are among the top six, while the nine least developed countries are among the bottom 11 countries with special needs from the region in terms of capacities to implement the Goals. Landlocked developing countries are seen to have heterogeneous levels of capacities, with five countries (Azerbaijan, Uzbekistan, Turkmenistan, Mongolia and Kyrgyzstan) in the middle of the distribution, two (Kazakhstan and Armenia) among the top five and one (Tajikistan) in the bottom half. In a similar fashion to its position in the network of countries, the small island developing State of Papua New Guinea is an outlier. While the lower levels of capacities of least developed countries to implement the Goals reinforce the message of the network of countries that these countries need particular attention and support

from the international community to implement the 2030 Agenda, other countries that are not least developed countries will also need such support.

Figure I
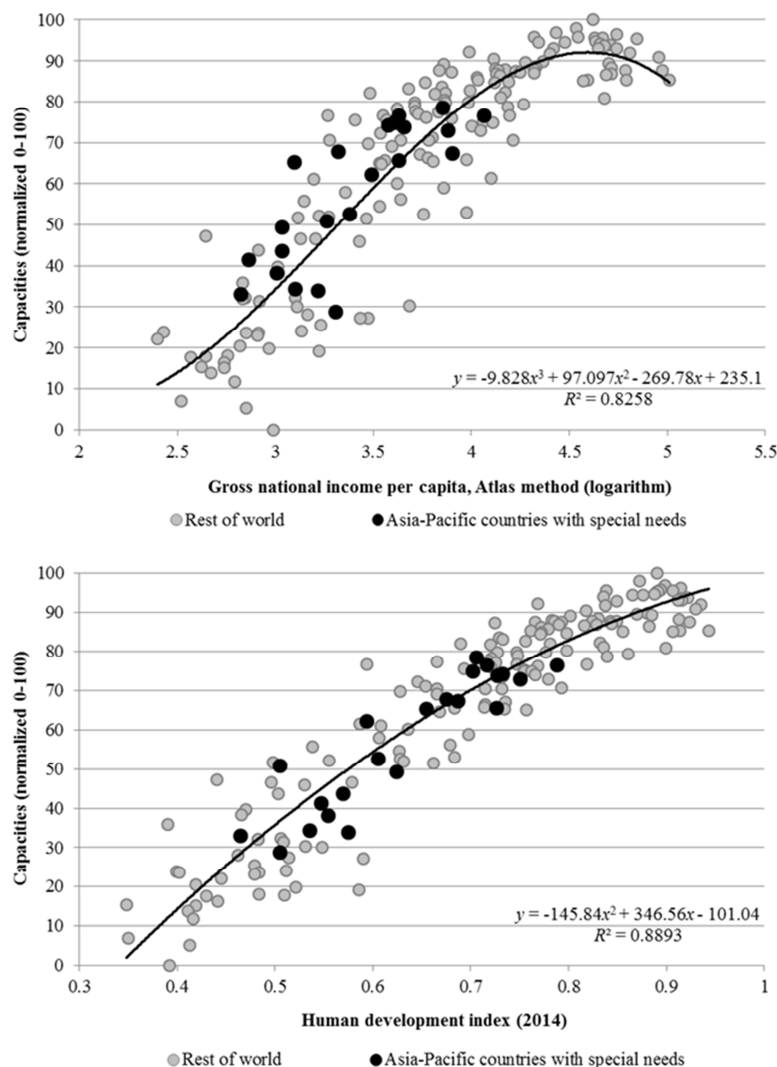**Capacities of Asia-Pacific countries with special needs to implement the Sustainable Development Goals**
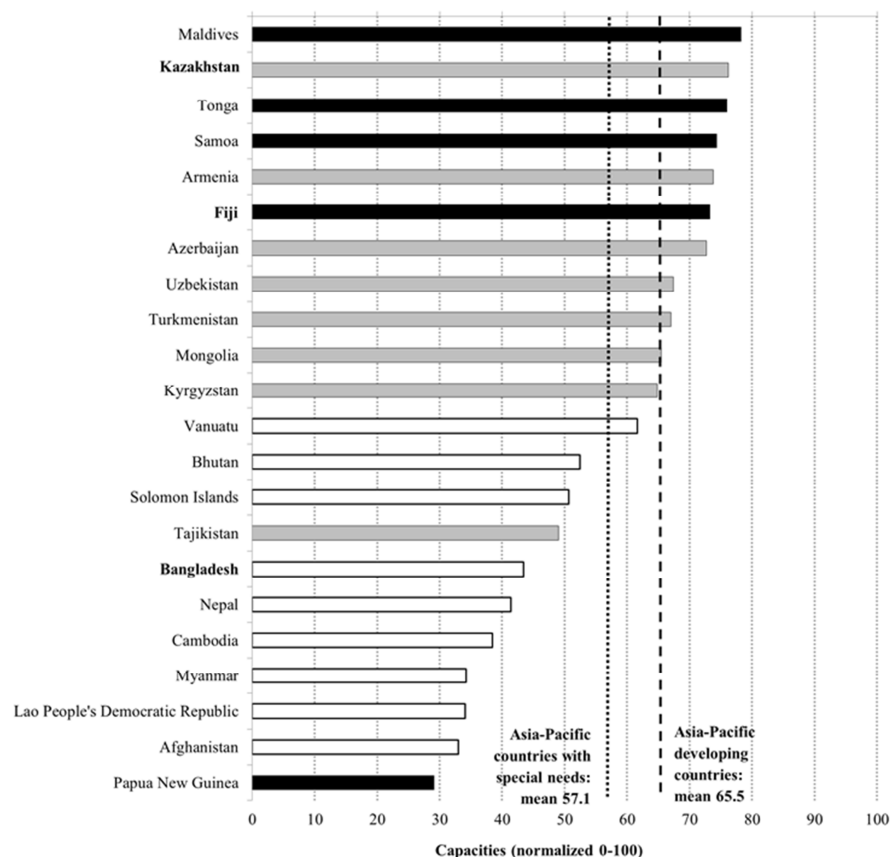
Source: ESCAP.

Notes: (a) Each country's capacities to implement the Sustainable Development Goals are normalized so as to be between 0 and 100, with 100 being the highest and 0 being the lowest level of capacities observed within the total set of countries included in the analysis; (b) "Asia-Pacific developing countries" in the analysis are all the regional ESCAP member States, with the exception of Australia, Japan and New Zealand; and (c) white, grey, and black bars represent least developed countries, landlocked developing countries and small island developing States, respectively.

20. Figure II shows that capacities to implement the Sustainable Development Goals are, to varying degrees, correlated with both income levels and the human development index, although the relationships are non-linear in both cases. The top panel of the figure shows that when comparing income levels measured by gross national income per capita with capacities to implement the Sustainable Development Goals, there is a tipping point at income levels of around $40,000 (roughly 4.6 on the logarithmic scale), where a further increase in income levels actually results in a decline in capacity. The reason is that although the overall attainment levels across the indicators are high for high-income countries, these countries have lower attainment levels in indicators related to the environment, food production and sustainable energy. For example, Luxembourg and Qatar, the two highest income countries in the sample, have very poor attainment in indicators such as carbon dioxide emissions per capita, renewable energy consumption and

output, and air pollution from particulate matter, considerably lower than even the least developed country average.

Figure II
Capacities to implement the Sustainable Development Goals versus gross national income per capita and the human development index

$$y = -9.828x^3 + 97.097x^2 - 269.78x + 235.1$$
$$R^2 = 0.8258$$

Gross national income per capita, Atlas method (logarithm)

○ Rest of world   ● Asia-Pacific countries with special needs

$$y = -145.84x^2 + 346.56x - 101.04$$
$$R^2 = 0.8893$$

Human development index (2014)

○ Rest of world   ● Asia-Pacific countries with special needs

Source: ESCAP.

Note: Each country's capacities to implement the Sustainable Development Goals are normalized so as to be between 0 and 100, with 100 being the highest and 0 being the lowest level of capacity observed within the total set of countries included in the analysis.

21.   Because per capita income refers to only one of the three pillars of sustainable development, a better way to gauge the appropriateness of the proposed measure of capacities to implement the Sustainable Development Goals is by comparing it with the human development index, which includes life expectancy and education in addition to per capita income. Not surprisingly, the figure shows that capacities to implement the Goals correlate more with the human development index than with income per capita. What is more interesting is that the relationship between the human development index and capacities to implement the Goals is also characterized by diminishing returns: for higher index levels, a unit increase has less of an impact on capacities to implement the Goals compared with a unit increase at

lower index levels. This result could be caused by the absence of environmental indicators in the human development index, along with a poorer performance in such indicators for countries with higher levels of human development.

22.   In sum, the figure is reassuring in that the proposed measure of capacities to implement the Goals is highly correlated to existing measures of economic and socioeconomic progress. However, considering that the 2030 Agenda is multidimensional and applies to countries of all levels of income, capacities to implement the Goals are more relevant than these existing measures because they are constructed from a broad set of indicators covering not only the three pillars of sustainable development but also governance and means of implementation.

IV.   Optimal pathways for implementing the Sustainable Development Goals

23.   Because the proposed measure of capacities for implementing the Sustainable Development Goals is directly related to the levels of attainment in all the indicators associated with the Goals and targets, it provides a synthetic way for countries to assess their progress towards the achievement of the 2030 Agenda. Capacities to implement the Goals can also be useful as a planning tool to guide countries on the prioritization and sequencing of the attainment of indicators over time. For that purpose, the value of the capacities measure could be calculated for a small increase in the value of a number of indicators, one at a time, selecting the indicator that yields the largest increase in capacities to implement the Goals. Iterating this calculation many times can produce an optimal pathway for progress towards the achievement of the Goals.[13]

24.   This calculation is country-specific, as it depends both on the specific levels of attainment of a country in each of the indicators and on the position of the country in the Sustainable Development Goals system. The latter provides critical information about the interlinkages, synergies and trade-offs between indicators on the one hand, and the degree of complexity of each indicator on the other. This information facilitates the selection of those indicators that will contribute the most to increasing capacities to implement the Goals. For instance, it seems intuitive to assume that it will be more costly for a country to make progress in an indicator characterized by a high degree of complexity compared with making progress in a less complex indicator, which could represent "low-hanging fruit".

25.   The level of attainment of a country in a particular indicator also provides useful information for the selection of indicators to prioritize because of the existence of diminishing returns. For example, when seeking to decrease carbon dioxide emissions, small changes in behaviours, such as increased use of public transport, cycling or walking, can bring about large reductions. However, as emissions are lowered, more significant investments are required for further decreases; for example, in significant behavioural and urban development and social planning solutions such as transit-oriented development. Similarly, the provision of various services, ranging from the Internet to education, is subject to agglomeration economies, as the same investment in infrastructure can reach significantly more people in densely populated areas, such as large cities, than in sparsely populated rural areas.

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[13]   Annex III of *Asia-Pacific Countries with Special Needs Development Report 2016* provides technical details of the optimization problem.

This suggests that it would be effective for countries to prioritize indicators in which their level of attainment is low.

26. In sum, a country-specific, optimal pathway for the implementation of the Goals can be derived by choosing to improve the attainment of those indicators that contribute the most to increasing a country's capacities to implement the Goals. By constraining the set of indicators eligible for improvement based on the criteria described above, the derived optimal pathway is specific to the current situation, capacities and levels of development of each country. The following section illustrates results from the derivation of optimal pathways for the implementation of the 2030 Agenda in a least developed country (Bangladesh), a landlocked developing country (Kazakhstan) and a small island developing State (Fiji).[14] The final section of this document compares the benefits of the derived optimal pathways with alternative scenarios.

A. Three case studies: Bangladesh, Kazakhstan and Fiji

27. Tables 1 to 3 lay out the suggested priority areas for Bangladesh, Kazakhstan and Fiji based on the objective of maximizing capacities to implement the Sustainable Development Goals. The results are aggregated into three five-year phases: 2016-2020, 2021-2025 and 2026-2030. The priority levels for each indicator are calculated as the percentage of steps in each phase for which the indicator is chosen as a priority relative to the total number of steps in each phase.[15]

28. The first characteristic of the optimal pathways for the implementation of the 2030 Agenda in the countries shown in tables 1 to 3 is a large concentration of a relatively small number of indicators. Although the top indicators for each country and phase shown in the tables represent only 10 per cent or less of the total number of indicators in the data, those few indicators are covered by around 80 per cent of the steps taken by each country in each phase. This suggests a very strategic approach for the achievement of the Goals, with a heavy policy focus on selected areas of great importance to the country. A second characteristic of the optimal pathways is sequencing, in the sense that the priorities vary from phase to phase. A third characteristic is that the results are dependent on each country's level of capacities and position in the Sustainable Development Goal system, tending to emphasize "low-hanging fruit" or indicators in which the country underperforms compared with other countries with similar levels of capacities to implement the Goals.

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[14] Besides their representation of the three groups of countries with special needs, the selected countries were chosen on the basis of their data availability: Bangladesh and Kazakhstan had data available for all 82 indicators, while Fiji had data for 75 indicators. For an application of the proposed analytical framework to Pakistan, see United Nations, Economic and Social Commission for Asia and the Pacific, "Pathways for adapting the Sustainable Development Goals to the national context: the case of Pakistan", MPFD Working Papers, No. WP/16/04 (Bangkok, 2016).

[15] Each step represents a small increase in the value of an indicator. The number of steps in each phase is country-specific and is derived from historical trends in the human development index, which are used to determine the amount of effort that a country is able to exert annually for capacity improvement. See annex III of *Asia-Pacific Countries with Special Needs Development Report 2016* for details.

Table 1
Top-priority indicators for the implementation of the 2030 Agenda in Bangladesh

Goal	Indicator	Priority level (percentage)
First phase (2016-2020)		
4	Education index (years of schooling)	12.1
4	Secondary education	11.5
10	Human inequality (health, education and income)	10.6
9	Internet users	10.1
9	Trade and transport-related infrastructure	8.3
5	Gender inequality (health, empowerment and labour)	8.0
8	Gross domestic product per capita	7.8
2	Food supply	7.5
8	Commercial banking	6.3
Other		17.8
Second phase (2021-2025)		
8	Ease of doing business index (regulations)	17.2
3	Infant mortality	12.1
6	Water productivity	10.0
2	Food supply	5.5
16	Overall life satisfaction index	5.5
9	Trade and transport-related infrastructure	5.2
8	Gross domestic product per capita	4.8
4	Education index (years of schooling)	4.5
4	Secondary education	4.5
10	Human inequality (health, education and income)	4.1
Other		26.6
Third phase (2026-2030)		
16	Overall life satisfaction index	12.1
6	Improved sanitation	9.7
3	Health index (life expectancy)	8.3
9	Internet users	7.2
9	Air transportation	6.9
9	Scientific and technical journal articles	6.6
2	Agriculture value added	5.2
3	Infant mortality	4.8
4	Secondary education	4.8
10	Human inequality (health, education and income)	4.8
Other		29.7

Source: ESCAP.

Note: Priority levels for the indicators are calculated as the percentage of steps in each phase for which the indicator is chosen as a priority relative to the total number of steps in each phase. See annex III of *Asia-Pacific Countries with Special Needs Development Report 2016* for details.

29.   In the case of Bangladesh, the optimal pathway emphasizes improvements in education as the top-priority area in the first phase (2016-2020), with 23.6 per cent of the improvements directed towards increasing years of schooling and the percentage of the population with secondary education. Additional priority areas in the first phase include two inequality indicators, representing 18.6 per cent of the improvements, and two infrastructure indicators, representing 16.1 per cent of the improvements. In the second phase (2021-2025), the top-priority indicator for Bangladesh is ease of doing business (17.2 per cent), followed by infant mortality (12.1 per cent) and water productivity (10 per cent). The two education indicators that are so highly prioritized in the first phase receive a lower, but still important, priority in the second phase (9 per cent), further highlighting the urgency for Bangladesh to invest heavily in education early on.

30.   In the third phase (2026-2030), overall life satisfaction becomes the top indicator on which Bangladesh should focus (12.1 per cent), followed by improved sanitation (9.7 per cent) and life expectancy (8.3 per cent). Three infrastructure and innovations indicators – the Internet, air transportation and scientific and technical journal articles – represent 20.7 per cent of the improvements in the third phase. The top priority of overall life satisfaction in this phase is consistent with the strong investments in education recommended for phase 1 and in ease of doing business for phase 2, as it is well documented that life satisfaction is positively related to human capital and governance.[16]

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[16]   See, for instance, Saamah Abdallah, Sam Thompson and Nic Marks, "Estimating worldwide life satisfaction", *Ecological Economics*, vol. 65, No. 1 (2008), pp. 35-47.

Table 2

Top-priority indicators for the implementation of the 2030 Agenda in Kazakhstan

Goal	Indicator	Priority level (percentage)
First phase (2016-2020)		
9	Trade and transport-related infrastructure	23.7
2	Agriculture value added	13.1
9	Air transportation	11.6
9	Scientific and technical journal articles	11.6
5	Gender inequality (health, empowerment and labour)	11.1
8	Commercial banking	10.6
9	Internet users	10.1
Other		8.1
Second phase (2021-2025)		
8	Commercial banking	22.4
8	Ease of doing business index (regulations)	8.5
9	Air transportation	8.5
9	Scientific and technical journal articles	8.5
2	Food supply	7.9
2	Agriculture value added	6.7
8	Gross domestic product per capita	6.7
9	Fixed-telephone users	6.7
Other		24.2
Third phase (2026-2030)		
6	Water productivity	34.5
3	Infant mortality	9.7
9	Air transportation	9.1
8	Ease of doing business index (regulations)	7.3
8	Gross domestic product per capita	6.7
2	Agriculture value added	6.1
10	Human inequality (health, education and income)	6.1
Other		20.6

Source: ESCAP.

Note: Priority levels for the indicators are calculated as the percentage of steps in each phase for which the indicator is chosen as a priority relative to the total number of steps in each phase. See annex III of *Asia-Pacific Countries with Special Needs Development Report 2016* for details.

31.   The top-priority indicators for Kazakhstan differ greatly from and are much more concentrated than those for Bangladesh. In the first phase, three indicators related to transport and telecommunications infrastructure represent as much as 45.4 per cent of the improvements. This heavy concentration on connectivity is understandable in light of the country's status of landlocked developing country. Some of these indicators, including scientific and technical journal articles (11.6 per cent) and agriculture value added (13.1 per cent) are of relatively high complexity, reflecting the high capacities of Kazakhstan to implement the Goals. In the second phase, the priority of transport and telecommunications infrastructure drops significantly, reinforcing the importance for the country to invest heavily and early on in this area. The top indicator in this phase is commercial banking (22.4 per cent), for which the current level of attainment of Kazakhstan is very low. Expanding commercial banking thus seems like reasonable "low-hanging fruit" for Kazakhstan to choose.

32.   In the third phase, the optimal pathway for progress in Kazakhstan identifies water productivity, measured as gross domestic product per cubic metre of total freshwater withdrawal, as the key area for improvement, with a priority level of 34.5 per cent. Such results highlight the specific circumstances of Kazakhstan, relying heavily on neighbouring Kyrgyzstan for the bulk of its water supply. The emergence of water productivity as a driving factor in the latter phase may signal the need for Kazakhstan to diversify its output base, which is dominated by oil production, to other less water-intensive sectors as the economy develops toward maturity.[17]

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[17]   In 2010, global withdrawals of water for energy production were estimated by the International Energy Agency (2012) to be 583 billion cubic metres, or 15 per cent of the world's total water withdrawals. Based on data in current United States dollars from the United Nations National Accounts Main Aggregates Database, the share of mining and utilities in terms of global gross domestic product was 7 per cent that year. Therefore, it is clear that energy is a highly water-intensive sector.

Table 3
Top-priority indicators for the implementation of the 2030 Agenda in Fiji

Goal	Indicator	Priority level (percentage)
First phase (2016-2020)		
5	Gender inequality (health, empowerment and labour)	19.9
9	Trade and transport-related infrastructure	15.7
9	Fixed-telephone users	13.9
9	Internet users	12.0
8	Gross domestic product per capita	10.6
2	Agriculture value added	8.3
Other		19.4
Second phase (2021-2025)		
8	Commercial banking	12.2
9	Fixed-telephone users	11.1
2	Food supply	10.0
9	Trade and transport-related infrastructure	9.4
10	Human inequality (health, education and income)	8.3
8	Gross domestic product per capita	7.8
9	Scientific and technical journal articles	7.8
4	Secondary education	7.2
5	Gender inequality (health, empowerment and labour)	6.7
Other		19.4
Third phase (2026-2030)		
4	Secondary education	15.8
8	Ease of doing business index (regulations)	14.7
2	Agriculture value added	12.1
8	Gross domestic product per capita	10.0
9	Scientific and technical journal articles	7.8
9	Trade and transport-related infrastructure	7.2
9	Internet users	6.1
10	Human inequality (health, education and income)	5.0
Other		21.3

Source: ESCAP.

Note: Priority levels for the indicators are calculated as the percentage of steps in each phase for which the indicator is chosen as a priority relative to the total number of steps in each phase. See annex III of *Asia-Pacific Countries with Special Needs Development Report 2016* for details.

33. The optimal pathway of Fiji has some similarities to that of Kazakhstan. For instance, both countries assign a high priority to transport and telecommunications infrastructure in the first phase, totalling 41.6 per cent of the improvements in the case of Fiji, which could be explained by the high cost of international trade that characterizes both landlocked developing countries and small island developing States. Interestingly, the composition of this initial high investment in infrastructure is different for both countries, with Fiji assigning a significantly larger role to telecommunications. This difference may be due to the larger distance of Fiji from international markets, which may make the cost of international trade in

services lower compared with merchandise trade. Another similarity is the top priority of commercial banking in the second phase in Fiji, although with a lower level of priority (12.2 per cent) than in the case of Kazakhstan. These similarities could be related to the fact that both countries have similar and relatively high levels of capacities to implement the Sustainable Development Goals, which enables them to focus on relatively complex indicators such as banking. A peculiarity of Fiji is the strong priority accorded to gender inequality (19.9 per cent) in the first phase, which could be due to the fact that the current level of attainment of Fiji in the gender inequality index is substantially lower than other countries with similar levels of capacities to implement the Goals.

B. **Identifying bottlenecks in developing capacities to implement the Sustainable Development Goals**

34.   The optimal pathways, illustrated in the previous section for the cases of Bangladesh, Kazakhstan and Fiji, are built so that they focus on improving the indicators in the most effective manner. The implication, as previously discussed, is a preference for indicators in which the country is lagging behind compared with other countries with similar capacities to implement the Sustainable Development Goals; for instance, to take advantage of agglomeration economies, as well as for indicators that are relatively less complex and thus on which it is easier to make progress faster. The discussion in the previous section provided some examples of these choices. The present section complements the previous one by discussing the bottlenecks and trade-offs in each of the three countries' optimal pathways.[18]

35.   The optimal pathway of Bangladesh shows a number of bottlenecks, such as poverty headcount, poverty gap ratio, the prevalence of tuberculosis and urban sanitation. With regard to Kazakhstan, the analysis suggests that tackling bottlenecks, such as drinking-water provision, increased life expectancy and prevention of tuberculosis, would further augment the process of developing capacities to implement the Goals. The main bottleneck to the implementation of the 2030 Agenda in Fiji is access to electricity.

36.   The analyses for the three countries suggest that indicators broadly related to environmental sustainability are less central to the development of capacities to implement the Goals than socioeconomic indicators. It should be noted that the three countries, with the exception of Kazakhstan for natural resources and carbon dioxide emissions indicators, have relatively high initial levels of attainment in environmental indicators. However, as is clear from tables 1 to 3, none of the indicators prioritized in the three countries' optimal pathways is related to the environmental Goals, which could be explained by the peripheral positon of environmental indicators in each country's network. In the absence of synergies represented by dense connections with other indicators, it is relatively more costly to make progress in the environmental indicators. Similar to the case of bottlenecks discussed above, the absence of progress in the environmental pillar may require special consideration both by national policymakers and by the international community.

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[18]   For further details on this analysis, see figures 3.10-3.12 of *Asia-Pacific Countries with Special Needs Development Report 2016*.

C. Scenario analysis

37. The present section compares predicted time series of capacities to implement the Sustainable Development Goals for the optimal paths and two alternative scenarios: [19] (a) a pathway in which the countries make improvements only on selected Goals associated with the main areas of focus of their respective programmes of action; and (b) a random pathway, which does not give precedence to any particular indicator. The Goals associated with the main areas of focus of a programme of action are those of whose targets the programme of action covers 50 per cent or more.[20] This criterion implies the following areas of focus for each programme of action:

(a) Istanbul Programme of Action for the Least Developed Countries for the Decade 2011-2020: Goal 1 (end poverty), Goal 2 (zero hunger), Goal 4 (quality education), Goal 6 (clean water and sanitation), Goal 7 (affordable and clean energy), Goal 8 (decent work and economic growth), Goal 9 (industrialization, innovation and infrastructure), Goal 10 (reduced inequalities), Goal 13 (climate action), Goal 16 (peace, justice and strong institutions) and Goal 17 (partnerships for the Goals);

(b) Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014-2024: Goal 7 (affordable and clean energy) and Goal 9 (industry, innovation and infrastructure);

(c) SIDS Accelerated Modalities of Action (SAMOA) Pathway (Samoa Pathway): Goal 2 (zero hunger), Goal 5 (gender equality), Goal 6 (clean water and sanitation), Goal 13 (climate action), Goal 14 (life below water) and Goal 15 (life on land).

38. The random pathway for progress assumes that countries do not optimize their capacities for implementing the Goals, randomly choosing indicators for improvement. While this third scenario is rather extreme and unrealistic, it serves as a baseline for comparison purposes. It could also represent a situation in which there is no policy coordination among various government agencies and levels of Government.

39. Figure III compares the three scenarios in Bangladesh, Kazakhstan and Fiji. For the three countries, the optimal pathway results in higher levels of capacities to implement the Goals compared with the pathway obtained from addressing only the main areas of focus of their respective programmes of action, with the random pathway leading to low or negligible increases in capacities. For comparison purposes, the figure shows the historical trends in the human development index for each country expressed in terms of capacities to implement the Goals.[21]

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[19] To estimate the predicted time series of capacities to implement the Goals from the cross-sectional data used in the analysis, a number of steps, described in annex III of *Asia-Pacific Countries with Special Needs Development Report 2016*, were taken. In essence, the calculation involved estimating how many steps countries were likely to undertake each year to increase capacities based on the historical trends of increases in the human development index.

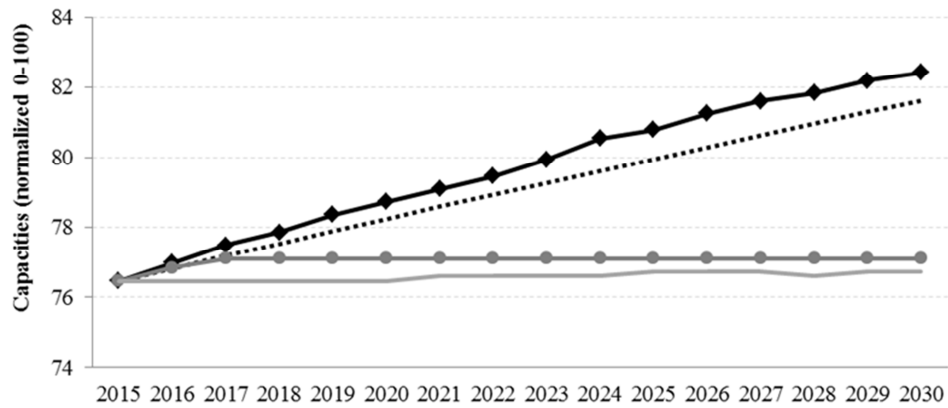[20] See table 2.4 of *Asia-Pacific Countries with Special Needs Development Report 2016*.

[21] The regression equation shown in figure II is used to convert predicted values from historical trends of the human development index into capacities to implement the Sustainable Development Goals.
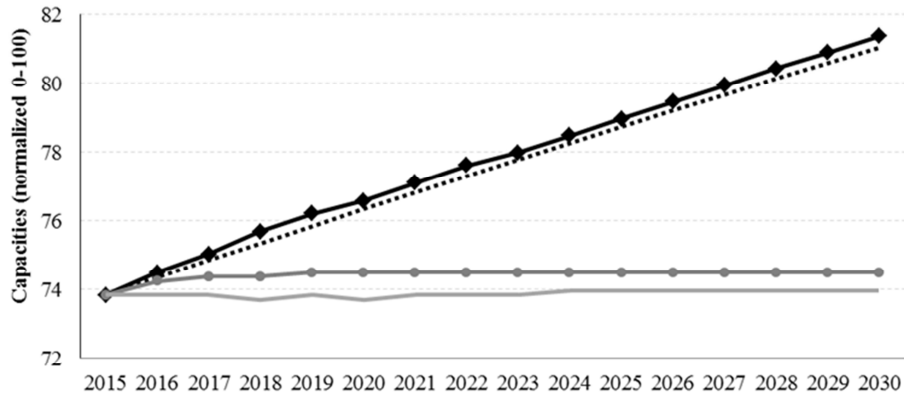
Figure III
Comparison of scenarios

A. Bangladesh
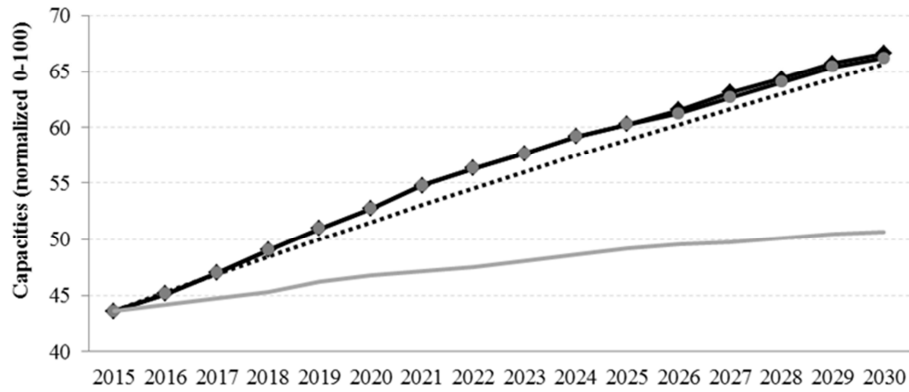
B. Kazakhstan

C. Fiji

········ Trend (2005-2013) ◆ Optimal ⬤ Programme of action — Random

Source: ESCAP.

Note: See annex III of *Asia-Pacific Countries with Special Needs Development Report 2016* for details about the construction of these figures.

40.   The most interesting differences across countries are those between Bangladesh and the two other countries. In the case of Bangladesh, the optimal pathway and the pathway defined by the Istanbul Programme of Action follow almost identical courses up to 2025, after which the optimal pathway results in a slightly faster growth in capacities to implement the Sustainable Development Goals. This suggests that the Istanbul Programme of Action is both comprehensive and a good match for the priorities of Bangladesh as regards implementing the 2030 Agenda. The predicted trajectories in capacities associated with both the optimal pathway and the pathway defined by the Istanbul Programme of Action exceed the historical trend of the human development index.

41.   In contrast, in the cases of Kazakhstan and Fiji, the optimal scenarios are predicted to bring about increases in capacities that are substantially higher than the pathway derived from considering only the focus areas of the Vienna Programme of Action and the Samoa Pathway. In the case of the Vienna Programme of Action, this is because only Sustainable Development Goals 7 and 9 satisfy the criterion for inclusion in the scenario described above. Although Goal 9 is very important to Kazakhstan, as is clear from table 2, focusing exclusively on infrastructure prevents the country from exploiting synergies between infrastructure and other areas of the 2030 Agenda.

42.   The figure shows that Fiji also performs poorly when the country focuses exclusively on a relatively small number of Goals. To be sure, the Samoa Pathway covers almost all the Goals of the 2030 Agenda and addresses the social, economic and environmental pillars in a balanced manner. However, when applying the criterion of including in the scenario only Goals of whose targets the Samoa Pathway covers more than 50 per cent, only Goals 2, 5, 6, 13, 14 and 15 are selected. Of these six Goals, Fiji prioritizes only Goals 2 and 5 in its optimal pathway (table 3). This leaves out the important priority assigned in the optimal pathway to Goal 8 (decent work and economic growth) and Goal 9 (industrialization, innovation and infrastructure), as well to other areas with lower but still meaningful priority, such as Goal 4 (quality education) and Goal 10 (reduced inequalities). As in the case of Kazakhstan, restricting the indicators for improvement prevents Fiji from exploiting synergies among indicators, such as those between agriculture value added and the Internet or between the gender index and trade infrastructure.

43.   In sum, the results show that while the main areas of focus of the Istanbul Programme of Action provide very good guidance for the implementation of the 2030 Agenda in Bangladesh, those of the Vienna Programme of Action and the Samoa Pathway are limited in terms of boosting sustainable development in Kazakhstan and Fiji, respectively. The criterion of restricting the choice of indicators to Goals of whose targets a programme of action covers 50 per cent or more may be too strict, and it would be desirable to explore other criteria for the alternative scenarios. The main conclusion of the present section is, however, very clear. It tells us that restricting the indicators may impede the exploitation of synergies across indicators from different areas. Taking full advantage of such synergies, which requires an understanding of the position of a country in the Sustainable Development Goals system, can allow the country to make significantly more progress in boosting its capacities to implement the Goals and move faster towards attaining them.

V.   Concluding remarks

44.   In the present document, a solution has been proposed to the complex problem of how to best prioritize and sequence the attainment of the Goals in the most effective manner, taking into account the unique circumstances, capacities and levels of development of individual countries. The solution is based on the consideration of a set of 82 indicators that are representative of the 17 Goals and 174 countries for which data are available as comprising a complex system, referred to as the Sustainable Development Goals system. This system provides detailed information on the interlinkages, synergies and trade-offs across different indicators from the viewpoint of each individual country. The system also allows the calculation of a summary measure of the attainment of the Goals for individual countries, which we refer to as capacities to implement the Goals. This summary measure, along with information in the Sustainable Development Goals system, allows us to obtain optimal, country-specific pathways of progress towards the Goals.

45.   The present document contains an illustration of the use of the proposed analytical framework to derive optimal pathways towards the Goals in three countries: Bangladesh, Kazakhstan and Fiji. The optimal pathways for the three countries have similarities in that they strongly prioritize attainment in a relatively small number of indicators, and that such priorities are sequenced over time. Another common characteristic is that the countries' priorities tend to include "low-hanging fruit" or indicators in which the country underperforms compared to other countries with similar levels of capacities to implement the Goals.

46.   In spite of these common, general characteristics, the specific indicators prioritized in each country are unique and distinct. In Bangladesh, for instance, the first phase (2016-2020) of the optimal pathway has a strong focus on education, reduction of inequalities and infrastructure. The first two elements could be related to the importance of human capital for a country to increase the diversification and sophistication of its production and the potential for a more even distribution of income to boost aggregate demand. In Kazakhstan and Fiji, which are more advanced countries than Bangladesh, the focus of the first phase is overwhelmingly on infrastructure. However, the composition of this initial high investment in infrastructure is different in each country, with Fiji assigning a significantly larger role to telecommunications. This difference may be due to the greater distance of Fiji from international markets, which may make the cost of international trade in services lower compared with merchandise trade.

47.   The analysis of the optimal pathways also uncovers a number of country-specific bottlenecks, defined as indicators in which the country is not expected to make substantial progress by 2030 that are highly connected with other indicators. The optimal pathways also show a perplexing lack of progress in the environmental indicators, which might be explained by peripheral location of these indicators in the network representations of the countries analysed. Such a peripheral position indicates a lack of synergies both among the environmental indicators and between them and the socioeconomic indicators, which makes it relatively more costly to address them. The importance of taking into account synergies in planning how to prioritize and sequence the attainment of the Goals is also a strong message from the analyses of alternative scenarios. Lastly, the very low performance of capacities to implement the Goals in the random pathways illustrates the need for policy coordination across government agencies and levels of government.

48.   Identifying country-specific bottlenecks and underperforming indicators through the derivation of optimal pathways for the implementation of the 2030 Agenda is important because special measures may be needed to address them. This information is useful to both national policymakers and development partners, as they could use it to contribute to maximizing the efficacy of support measures.

49.   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 Sustainable Development Goal indicators as soon as they are finalized. The use of the official indicators will provide more clarity for identifying achievement of Goals. 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 Goal-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 sustainable development in follow-up workshops.

50.   The Special Body on Least Developed, Landlocked Developing and Pacific Island Developing Countries may wish to guide the secretariat on ways to support countries with special needs in the implementation of the 2030 Agenda, including by further developing analytical frameworks such as the one discussed in this document.

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