Biodiversity Conservation and the UN's Sustainable Development Goals: India's Responses Evaluated—Particularly in Relation to SDG15

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15.1 Introduction

Sustainable Development Goal 15 (as part of the UN's Global Agenda 2030 development) is focused on conserving life on land. Its stated aim is primarily 'to foster the adoption of policy measures to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation while also integrating ecosystems and biodiversity into national and local planning developmental processes, poverty reduction strategies and national accounts'. In addition, it 'seeks to promote a fair and equitable sharing of benefits arising from the utilization of genetic resources, promote appropriate access to such resources and prevent poaching and trafficking of protected species of flora and fauna'. It sets out 12 targets to be achieved by (or before) 2030 for this purpose, all of which relate to the conservation of natural biodiversity and natural ecosystems on land.

As discussed below, India has determined quantitative performance values for achieving 3 of the 12 targets listed in Sustainable Development Goal 15 (SDG15) by 2030.[1] It is also recognized by India that SDG15 is closely interrelated with the achievement of most of the other SDGs. This interdependence will be taken into account in this discussion which primarily concentrates on India's plans to satisfy SDG15.

The aim of this chapter is to discuss the adequacy of India's plans for meeting SDG15 and interrelated targets and to consider the likelihood of India meeting these targets. Because conserving biodiversity is central to SDG15 and raises issues about what constitutes biodiversity conservation (which includes ecosystem conservation), the multiple dimensions and nature of biodiversity are discussed first. This is followed by a general examination of the relevance of biodiversity conservation and methods for achieving sustainable development.

In turn, the following points are then critically analysed:

1. India's quantified biodiversity targets for achieving SDG15.
2. The relationship between India's targets for SDG15 and its other SDG targets.
3. India's prospects for meeting its biodiversity SDG targets.

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[1]All the references to India's SD plans in this discussion are drawn from the United Nations and NITI Aayog (2018) Report.

A discussion and concluding comments wrap up this chapter.

15.2 The Multiple Dimensions of Biodiversity

The stock of biodiversity is multi-faceted (Magurran 2003) and not easily quantified by a single measure (Juhász-Nagy 1993). Both the diversity of ecosystems and that of genetic material are components of the extent of biodiversity. The exact measurement of the extent of biodiversity is hampered by the fact that different ecosystems are not discrete and can be defined at different spatial scales (Tisdell 2015, Chap. 2; Tansley 1935). Judgement is required about the appropriate scale on which to classify different ecosystems and the categorization of differences can alter with each problem being considered. For example, in relation to the UN's SDGs (Sustainable Development Goals), many ecosystems on land (SDG15) are interdependent with those below the water (SDG14).

There is also the problem that not all genetic material is of equal value for achieving SD. Furthermore, differences exist in the extent of the disparity between types of genetic material and their rarity. This adds to the difficulty of devising a meaningful or single index of the stock of biological diversity. As yet, no satisfactory index of the extent of biodiversity has been devised. This is probably because biodiversity involves the diversity of diversities (Juhász-Nagy 1993). Nevertheless, it is clear that the extent of natural biodiversity has declined significantly due to human activity. This decline has been substantial in modern times, as for example evidenced by the global loss of wild vertebrate animal species (Whitmee et al. 2015; World Wide Fund for Nature 2014).

A further factor that needs to be taken into account in evaluating biodiversity conservation is the status of heritage human-developed genetic material and ecosystems, for example, those pertaining to agriculture and other forms of human-managed biological production (Tisdell 2015, Chaps. 2 and 8). Evolution of human selection and production of new genetic combinations for cultured organisms and human changes in ecosystems for cultivating organisms often threaten the conservation of pre-existing heritage biodiversity as well as the stock of natural biodiversity. Therefore, trade-off issues need to be considered when biodiversity conservation policies are devised to foster SD.

Whether or not adequate attention will be paid to conserving biodiversity in India (and elsewhere) is doubtful for at least two reasons.

1. Biodiversity conservation issues are extremely complex and bounded rationality limits the scope for the rational determination of the trade-offs.
2. Different government bodies have control over public decisions relating to different aspects of biodiversity and to a large extent act independently. They often have and do pursue different agendas. Public policy decisions are, therefore, commonly made on a partially uncoordinated basis.

Because different biodiversity targets are assigned to different SDGs (not all of which appear to be well aligned with one another), this may encourage different government bodies to try to fulfil several of the potentially conflicting targets independently, e.g. government agricultural bodies may act independently of forest and other conservation bodies.

15.3 The Relationship Between Sustainable Development and Biodiversity Conservation: Conflicting Perspectives

The overarching aim of the UN's SDGs and associated targets is to foster the achievement of sustainable development (SD). However, that raises the question of what exactly is meant by SD. The problem is that diverse definitions exist of what constitutes SD. Economic definitions of SD are invariably anthropocentric in nature. For example, one economic view of SD is that it requires common economic activity to be managed in a way that ensures that the income per capita of

future generations is no less than that of current generations. Another is that the economic activities of present generations should be such that future generations should be left sufficient scope to enjoy no less income per capita than that of the present generation. To what extent (if any) must present generations forgo income in order to achieve these goals? Is it necessary for them to do this? How are these sustainability goals to be achieved? We are still struggling to provide definitive answers to these types of questions.

Not all citizens are willing to accept the types of anthropocentric criteria for the SD proposed by economists. For example, 'dark green ecologists' place a high weight on conserving natural ecosystems and natural biodiversity. They support policy measures to do this even if it involves some decrease in the incomes and economic welfare of mankind.

Individuals differ in their willingness to conserve nature. Consequently, because of conflicting values, it is probably impossible to devise SDGs and associated targets which will satisfy everyone. Therefore, for political acceptability reasons, SDG goals and targets tend to be expressed in general terms and are, to some degree, open-ended. Furthermore, they may not be always entirely consistent. In fact, the 2030 Sustainable Development Agenda provides individual nations with a huge amount of flexibility (leeway) in devising policies to satisfy the SDG goals and targets.

15.4 India's Quantified Biodiversity Targets for Achieving SDG15, That Is, for Conserving Life on Land

15.4.1 Constraints on India's Choice of Targets and Procedural Considerations

The UN's Sustainable Agenda places a heavy emphasis on the quantification of the targets which individual nations decide on in order to achieve their various global sustainable goals. Nevertheless, it is left to individual nations to determine which targets they will pursue, how

they will quantify their aspirational targets and how they will monitor their progress in achieving these targets. The premium placed on the quantification of SD targets has had the effect that only a limited amount of targets are being selected to satisfy the SD agenda. One reason is that insufficient data are available to quantify all targets.

The policy planning procedure is to first determine baseline values for each of the selected targets which a nation hopes to achieve. Targets are then decided on. Only 3 of the 12 targets for satisfying SDG15 have been quantified by the Union Government of India. It is said that these performance indicators 'have been selected based on availability of data at the national level and to ensure comparability across States and Union Territories (UTs)' (United Nations and NITI Aayog 2018, p. 167). Because India has a federal structure of government and the government of its individual states and UTs has considerable control over their management and conservation of forests, the prospects of achieving targets for conserving nature (especially forests) depend heavily on the policies pursued by each of the states and UTs.

15.4.2 India's Aspirational Levels for SD Targets 15.1 and 15.2

India's Union government has decided to pursue three targets as its contribution to achieving SDG 15. The first two of these targets are as follows:

15.1 By 2030, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and the services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements.
15.2 By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.

In relation to SD target 15.1, India proposes to increase its forest cover by one-third (33%) by 2030 compared to its baseline coverage in 2015

(21.54%). This would result in its forest cover increasing to around 28–29% by 2030. It also seems that India wishes to maintain (for India as a whole) the same areal proportion of water bodies within its forested areas as in 2015. Consequently, as its expansion of forest cover occurs, it wants to ensure no decline in the proportionate area covered by water bodies in its forested areas.

Its plans for contributing to SD target 15.2 are rather vague. However, it appears that it may want to maintain the type of forest management policies which prevailed between 2015 and 2017 and which are claimed to have been associated with 0.21% increase in Indian forest cover.

15.4.3 Shortcomings in India's Choice of SD Targets 15.1 and 15.2

The SD targets 15.1 and 15.2 chosen by India only partially reflect the actual targets suggested for the Global Agenda. First, the nature and quality of forest cover is not addressed. Degraded forests are likely to have a negative effect on the conservation of nature biodiversity and the ecosystems services emanating from forested land. Second, plantation forests are given equal weight to those forests that are more natural in character. The former often lack diversity and can have a negative impact on the conservation of biodiversity. Third, there needs to be greater transparency in how the nature of forest cover is determined, that is how much an area must be forested to be considered to be forested? Fourth, plans for conserving drylands and high mountain areas that are naturally not forested have been left up in the air. Such areas are often unsuitable for conservation by means of tree planting (Tisdell and Xue 2013).

Maintaining the proportionate water area in its forests has also been selected by India as part of its contribution to meeting SD target 15.1 of the SD Global Agenda. However, such a strategy may not be very effective in conserving natural biodiversity. This is because the water area in forests would include dams constructed for meeting human demands, e.g. for irrigation, industrial and household water use. Usually, these structures result in reduced natural biodiversity, e.g. as a result of flooding forests and wetlands. The qualities of the water areas conserved need to be taken into account and this has not been done in this case. It also needs to be borne in mind that India's surface waters are highly polluted (Lélé et al. 2018). This is mainly as a result of the discharge of effluents from industry, agriculture and households into water bodies. Maintaining the proportionate areas of water bodies in forests may do little to ameliorate this pollution problem.

As pointed out above, India's stated aspirations for contributing to the realization of SD target 15.2 are unclear although it indicates that it will be contributing to the satisfaction of this target. Its plans provide no specific target for the sustainable management of all types of forests. Nevertheless, it might be claimed that this target is partly satisfied by India's plans to increase its forest cover by one-third by 2030. However, it can be concluded that target 15.2 is not effectively addressed. Consequently, India is only focusing on 2 not 3 of the 12 SD15 targets for promoting the SD Global Agenda, namely targets 15.1 and 15.7.

15.5 India's Plans to Contribute to the Fulfilment of SD 15.7

15.5.1 The Target Quantified by India

The stated UN Global Agenda 2030 SD 15.7 target is to 'take urgent action to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products'. India's quantitative plan for contributing to this target is to ensure that its population of wild elephants is sustained at its level in 2017.

The reason given for this chosen target, however, is not directly related to SD target 15.7. India's agenda states 'Since elephants have high dietary requirements, their population can be supported only by forests that are under optimal conditions' (United Nations and NITI Aayog 2018, p. 173). The reason given for conserving

elephants appears to be more relevant to SD target 15.2 than 15.7.

15.5.2 Discussion of India's Selected Component of SD 15.7

If India achieves its plans for maintaining the level of its population of wild elephants, a number of factors could contribute to that objective. These include avoiding a reduction in forest habitat suitable for the sustenance of wild elephants and reducing any trafficking in elephant products, such as ivory. However, the Asian elephant (unlike the African elephant) is not so valuable as a source of ivory. Possibly, a greater number of Asian elephants are killed as agricultural pests than for their ivory. Wild elephants can be significant agricultural pests (see, for example, Bandara and Tisdell 2002). No mention is made of how India plans to tackle the problem of reducing the number of elephants killed because of the damages they do to agriculture.

The role of wild elephants in promoting or reducing biodiversity in forests is not discussed in India's SD plans. Many ecologists classify elephants as umbrella species which by their activities help to promote natural biodiversity within their habitats. While this is true in some cases, elephant populations can increase to such an extent that they exceed the carrying capacity of forests and reduce biodiversity within them. Consequently, their population may need to be reduced by culling to preserve an ecological balance.

The question also needs to be asked of why concentrate only on the conservation of the Asian elephant when so many other wild species in India are threatened with extinction. Is it because the elephant has great cultural significance for most Indians (Tisdell and Bandara 2004)? As mentioned above, it is said that one of the reasons is that the population of elephants is a barometer of the health of the forest. If that is really true, the health of India's forests must have improved dramatically in the 5-year period 2012–2017 because it is estimated in the baseline report that the population of wild elephants in India in that period rose by nearly 20%. It is, however, pertinent to ask: how reliable were the population estimates? Also to what extent was the estimated increase in the elephant population due to more reliable estimates in 2017 than earlier? Because elephants are only capable of increasing the level slowly, (they are k-selected species) it is possible that the estimated increase in their populations of 20% in 5 years could well be on the high side. It needs to be compared with the biological possibility of this happening.

15.6 Other Aspects of India's Plans to Contribute to the Fulfilment of SD Goal 15

India is intending to use an index score to measure how well it performs in achieving SD goal 15 and to specify this for each of its states and UTS. One of the ideas behind this is that it will enable each of India's states and UTs to determine how well it has performed in achieving India's chosen targets for contributing to SD goal 15. It will enable each to compare its performance with other states and UTs. The index is a normalized one in which each target is equally weighted. In effect, this gives each equal importance. However, it is debatable whether all the chosen targets should be weighted equally. At least doing this ought to be justified.

The use of such an index may also tend to conceal the fact that many SD targets are not addressed in the sustainable development plans of India. For example, no specific attention is given to addressing the following:

1. Combating desertification (a part of global SD target 15.3);
2. Conserving mountain ecosystems (a part of global SD target 15.4);
3. Overall action to protect and prevent the extinction of threatened species (Target 15.5); and
4. No mention is made of 'measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and

water systems and control or eradicate the priority species' (Target 15.8). Alien pests can be a serious threat to natural ecosystems and biodiversity as well as to agroecosystems and agricultural biodiversity.

15.7 The Links of SD Goal 15 with Other SD Goals

India's baseline report on its plans for contributing to the Global Agenda for SD states that its plans for achieving SD Goal 15 are closely linked with the fulfilment of several other SD goals (United Nations and NITI Aayog 2018, p. 166), but it fails to spell out the links. It claims that meeting its stated targets for Goal 15 will make a positive contribution to the following:

1. Eliminating poverty (Goal 1);
2. Ending hunger (Goal 2);
3. Ensuring good health and well-being (Goal 3);
4. Bringing about greater gender equality (Goal 5); and
5. Creating clean water and improved sanitation. Furthermore, it is claimed that its targets for Goal 15.
6. Reducing economic inequality (Goal 10);
7. Promoting sustainable consumption and production (Goal 12); and
8. Strengthening resilience and adaptive capacity to react to climate change (Goal 13).

A shortcoming of the plan is that it does not provide a clear guide to most of these interconnections and there is no indication of the size of the synergies involved. For example, India's support for the objective of promoting a fair and equitable sharing of genetic resources (especially natural genetic material in the wild in India) is likely to do little to improve income inequality in India, particularly after the administrative costs of distributing any fees obtained for the use of this material are taken into account (Tisdell 2015, Chap. 10). Furthermore, no mention is made of the real possibility that increasing forest cover could contribute to life below the water (Goal 14).

More attention should be paid to the fact that increasing forest cover in India is unlikely to be sufficient to significantly increase the quality of its freshwater resources. India's surface waters are highly polluted (Lélé et al. 2018). Pollutants enter these waters from mining, agriculture and households e.g. sewage and other sources (Fig. 15.1). Polluted water is a threat to human health; can lower agricultural production e.g. because the water may be toxic to livestock and unsuitable for irrigating crops; and can reduce biodiversity, e.g. by diminishing the diversity of water-based biota. A reduction in the extent of forest cover and natural vegetation adds to these problems. Increasing and improving the quality of this cover can help ameliorate water pollution, but it must be complemented by policy measures to substantially reduce the other sources of water pollution.

The lack of treatment of urban sewage and the discharge of sewage into water bodies are major sources of water pollution in India. In around 2015, the urban sewage treated before discharge was only 37.58%. As part of its contribution to the attainment of Goal 6, India plans to increase this to 68.79% by 2030, that is virtually double the percentage of sewage treated before its release into water bodies. Even if this target is achieved, the discharge of urban sewage into water bodies is still likely to cause considerable water pollution. Also problems of water pollution associated with mining, manufacturing, agriculture and other economic activities will need to be addressed, if India's water pollution is to be substantially reduced. India's target for raising agricultural productivity as part of its goal to achieve zero hunger by 2030 is, in part, likely to result in increased water pollution.

India aims to double its yield of rice, wheat and coarse grains from its 2015 baseline figure of 2509.22 to 5018.44 kg/ha by 2030, as part of its contribution to achieving zero hunger by 2030 (SD Goal 2). This requires India to double the yield of these crops. One wonders whether this is a reasonable objective and how this target is going to be achieved. The fact that yields in the Punjab have almost reached this target is mentioned by the United Nations and NITI Aayog (2018) as an indicator that this target could be met. However, the scope for attaining similar yields in many other parts of India is constrained by poorer environmental conditions. In order to
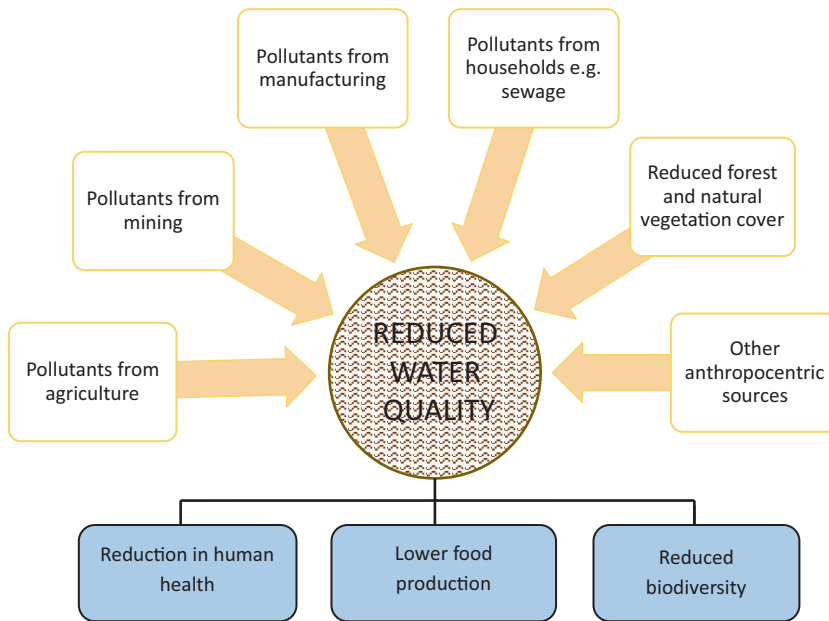
Fig. 15.1 Multiple contributors to reduced water quality and consequences of water pollution. Note also that a reduction of water flows can add to the degree to which water is polluted

achieve the increase in agricultural yields aspired to, it is highly likely that more water, larger amounts of chemical fertilizers and greater quantities of pesticides will be used in agricultural production. Consequently, greater pollution of water bodies as a result of more intense agricultural activity can be expected.

Increased yields may partially come about as a result of improved varieties of agricultural genomes. However, this type of development is a double-edged sword because it is usually associated with a loss of heritage varieties of crops (Tisdell 2015, Chap. 5). In addition, the agricultural intensification strategy can have adverse consequences for the conservation of biodiversity generally, especially if the area allocated to agricultural production rises at the same time as intensification occurs.

It should also be noted that while target 2.5 of the SD Agenda 2030 states that efforts should be made to 'maintain genetic diversity of seeds, cultural plants and domesticated animals and their related wild species', India has not proposed any specific targets for doing this. It is likely that heritage biodiversity will continue to decline in India.

There is an urgent need to undertake research to prioritize the types of genetic material which needs to be conserved and for greater account to be taken of the economics of this conservation (see for example, Tisdell 2016). Although India is very supportive of policies to ensure a fair and equitable sharing of benefits from the utilization of genetic resources and associated traditional knowledge, there is no guarantee that this policy will be very effective in conserving genetic resources and traditional knowledge or that it will result in the most desirable selection of those resources and knowledge.

15.8   Discussion

Devising targets to contribute to Global Agenda 2030 is a formidable task, especially since the UN has a preference for individual nations to quantify their targets. The targets selected by India have been partly determined by data availability, the political inputs of its Central Ministries and the possibility of their relevance to at least half of its states and UTs. This has resulted in

many targets not being addressed or only being partially addressed. There are undoubtedly cases where relevant data do not exist for at least half of India's states and UTs, but associated conservation targets (and others) would be highly relevant for contributing to the fulfilment of Global Agenda 2030. Procedures for selecting targets are clearly subject to biases.

Although the United Nations and NITI Aayog baseline report (2018) claims that a holistic approach has been adopted in selecting India's SD targets, as pointed out above, the interconnections between the targets are not well articulated. Furthermore, in this chapter, possible conflicts between the selected targets have been noted. In addition, it is likely to be left to individual Central Ministries to foster individual targets which fall within their area of public administration. They may tend to do this independently and jeopardize India's performance in achieving all its SD targets.

Again, India's policy interventions for achieving its SD targets appear to be weak, because no targets are available yet for its individual states and UTs. It appears that consultation and persuasion by NITI Aayog with pubic authorities in India's states and UTs is going to be the main means for getting them to contribute to India's SD goals. How well this will work remains to be seen.

India's targets are not set in stone. Politicians are likely to have a major influence on whether serious steps are taken to achieve them. India is a democratic country and politicians compete for votes. The pro-economic growth sentiment still remains very strong in India, as in other parts of the world. Environmental conservation may still be sacrificed in India for some time yet in favour of economic growth. It is generally believed that the BJP (led by Narendra Modi) strongly favours economic growth policies. In 2019, this party was re-elected to govern India with Narendra Modi as Prime Minister. Therefore, it could be an uphill battle for India to achieve its major environmental conservation targets by 2030.

It is clear that the Indian baseline report on biodiversity conservation, especially SDG 15 does not pay enough attention to the varied biogeographic zones of India and the biodiversity hotspots of India (see PMF IAS 2019, https://www.pmfias.com/biodiversity-hotspots-india/).

This is partly because the focus of this report is on the political divisions of India. Although its prime focus on conserving wild elephants is useful, it is too restricted as a measure for conserving biodiversity in the wild. Most of India's biodiversity hotspots are under increasing pressure due to economic growth. This is ignored.

In addition, there should have been more attention paid to policy measures to ensure more effective enforcement of nature conservation in India. Poaching of protected animals and the removal of protected flora from conservation areas still remain a problem as does the use of these areas for illegal grazing of livestock. However, enforcing conservation regulations and laws in LDCs is much harder than in higher income countries for social and economic reasons.

15.9 Conclusions

As was shown, shortcomings in India's plans for contributing to the fulfilment of the SD targets, set out in the UN's Global Agenda 2030, reflect deficiencies in the specification of the SD targets in this agenda and in the type of SD that ought to be pursued by nations. Furthermore, the agenda does not prioritize the desirability of conserving different types of biodiversity and ecosystems. The imprecision of Global Agenda 2030 has probably been dictated by the need to obtain the political support of most sovereign nations for it. In addition, it has been left to individual nations to determine which SD targets they will pursue. However, a preference has been expressed by the UN for the selection of targets that can be quantified. Again leaving individual nations to select the specific SD targets to be pursued by them probably reflects political realities, that is, the need to take account of their national sovereignty. The proposed global agenda possibly had to be broad enough (and sufficiently vague) for it to be adopted by most nations. India's responses to Global Agenda 2030 reflect the 'fuzzy' nature of the agenda itself.

As was shown above, India has only selected a small number of targets for contributing to the fulfilment of SD Goal 15 (the conservation of life on land) and other SD goals. SD Goal 15 mainly

focuses on the conservation of natural biodiversity and the preservation of natural ecosystems on land and within these selected targets, India has only chosen very restricted items as targets to be achieved. Consequently, India's response to the Global Agenda 2030 is very patchy.

Furthermore, what to do about conflicts between different targets has not been resolved by India. For example, the possible conflict between raising agricultural yields and conserving biodiversity and ecosystems has yet to be tackled. It has also been pointed out that India's Central Ministries might independently pursue SD targets which come within their ambit of administration. Thus, no coordinated attempts may be made to resolve conflicts between different Indian SD targets.

India has both a democratic and a federal political system. Meeting its SD targets will depend heavily on the cooperation of the governments of its states and UTs and the agendas of political parties. Consultation and persuasion seem to be the main chosen vehicle for getting India's states and UTs on board with the Union's SD targets. These may not be strong policy instruments. In addition, elected political parties may still find it opportunistic to pursue pro-economic growth policies at the expense of environmental conservation if these are vote-winners.

While Agenda 2030 is likely to maintain awareness about the desirability of achieving SD and the important contribution that conserving biodiversity and ecosystems can play in the SD process, its practical effects might be quite limited in India and elsewhere. There is a risk that the main impact of Global Agenda 2030 could be to provide extra-employment for national and international public administrators. It may also be that some of its SD targets will be met independently of the agenda. That is not to deny that Global Agenda 2030 is trying to address issues that warrant urgent attention in a difficult global political environment.[2]

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[2]Some additional problems associated with the UN's Global Agenda 2030 are raised in Svizzero and Tisdell (2016).

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