



# IJEAST

INTERNATIONAL JOURNAL  
OF ENGINEERING APPLIED SCIENCE  
AND TECHNOLOGY



**VOLUME : 4    ISSUE : 02    Print / Issue Publication Date: 30-Jul-2019**



**ISSN : 2455-2143**



**DOI : 10.33564/IJEAST.2019.v04i02.006**

Indexed In



[WWW.IJEAST.COM](http://WWW.IJEAST.COM)

[editor@ijeast.com](mailto:editor@ijeast.com)

# SUSTAINABLE LAND MANAGEMENT INDICATORS UNDER THE FRAME OF UN SDG 15: LIFE ON LAND (A CASE STUDY ON INDIA)

Nikhil Ravindra  
Urban Development  
Technische Universität Berlin, Germany

**Abstract**— During the United Nations summit held on 1<sup>st</sup> January 2016, 193 countries agreed on 17 ambitious approaches called the ‘Sustainable Development Goals’ in order to save the planet by promoting a balanced and sustained development. India (case study country) as one of the signatories, has come up with unique and context specific indicators to achieve the desired targets. The research paper aims to highlight goal no.15: life on land; to better understand the country’s progress. The country’s contribution and progress are crucial due to multiple reasons; one such reason being 21% of the country’s land is protected as forest cover. The overall objectives are to analyze major practices and mention some of the most prominent challenges. Four major programmes and schemes have been mentioned: country partnership, national afforestation, grants in aid for voluntary organizations and farmers field school. Challenges highlighted are under two categories: global problems with Sustainable Development Goals and case specific concerns related to goal 15 implementation in the country. Furthermore, potential linkages or synergies of goal no.15 with other goals have been checked in order to suggest possible measures to combat the challenges. All of these objectives have been achieved by using simple research tools of reviewing literatures and researching online platforms. The measures suggested are integrated institutional framework, innovative communicative strategies, mainstreaming biodiversity and ecosystems in all sectors; and encouraging through business leadership to enhance the overall progress.

**Keywords**— United Nations, Sustainable Development Goals, Goal 15, Life on Land

## I. INTRODUCTION

### A. Background

The *17 Sustainable Development Goals (SDG’s)* from the *2030 Agenda for Sustainable Development* was adopted by world leaders on 1<sup>st</sup> January 2016 at the United Nations (UN) summit. The goals have been built upon the *Millennium Development Goals (MDG’s)* and is an action call for all nations (poor, middle-income and rich) in order to simultaneously protect the planet and promote prosperity (UN, 2019).

**Goal no. 15: Life on land** vision as quoted in the UN website (DESA, 2019) is to “*Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*”. **Targets and indicators** for this goal have been mentioned as it is in *annex A1 and A2*. The goal was formulated based on the fact that globally 2.6 billion people are directly dependent on agriculture. In India, 52% of land reserved for agricultural is affected by soil degradation (UNIndia, 2019). The country plays a strategic role in achieving the goals because of the numerous reasons mentioned in *Objective 3*.



Fig. 1. Goal no.15 encouragement image by UN India [18]



**B. Objectives**

The overall approach of the research is to study and analyze the following objectives briefly for goal no.15 in India:

- A. Analyze current programmes or schemes
- B. Highlight major challenges
- C. Co-relating with other goals
- D. Suggest effective measures

**II. RESEARCH QUESTIONS AND METHODOLOGY**

**A. Research Questions**

Based on the four objectives, the following research questions in Table 1 have been formulated to address the objectives of this topic in the Indian context:

Table -1 Research questions for each objective

Objectives	Research Questions
Analyze current programmes or schemes	<b>What</b> are the main approaches to achieve the desired targets?
Highlight major challenges	<b>What</b> are the problems and <b>why</b> they are important to be addressed?
Co-relating with other goals	<b>What</b> are the linkages with other goals and <b>how</b> are the synergies created?
Suggest measures	<b>How</b> can the challenges be overcome more effectively?

**B. Methodology**

The research questions have been answered by using limited tools i.e. literature review and desktop research. Literature review is by studying publications, journal articles on related topics. Whereas for desktop research; websites of UN, UN India and Ministry of Environment, Forest and Climate Change (MOEF) in addition to other institutional webpages have been referred to.

**III. ANALYSIS AND DISCUSSION**

**A. Objective A\_ Current Programs or Schemes**

Following are the main and most important programmes or schemes linked with goal 15:

1. Under the **Global Environmental Facility (GEF)**'s, is a **Country Partnership Programme (CPP)** called the **Sustainable Land and Ecosystem Management (SLEM)** which is a joint initiative along with the Government of India. The programme objectives are promoting sustainable land management practices, biodiversity conservation and maintaining eco-system capacities (MOEF, 2019). The MOEF is the national level executing entity with Indian Council of Forestry Research and Education (ICFRE) assigned as the Technical Facilitation Organization (FRI, 2019).

2. **National Afforestation Programme:** A participatory approach to Sustainable development of forests. This programme is designed with long term and short term objectives with a two-tier state level implementing agencies namely; Forest Department Agencies (FDAs) and Joint Forest Management Committees (JFMCs). One main approach is empowering local people participation by involving them in the decision making process (NAP, 2018, pp. 1-2).

3. **Grants in aid Scheme for Voluntary agencies;** the National Afforestation and Eco-Development Board (NAEB) provides 100% financial aid to voluntary/non-governmental agencies for afforestation and eco-development activities (NAEB, 2018).

4. **Farmer's field school** is a skill-development concept or scheme started in the year 1989 by the Food and Agricultural Organization (FAO) in Indonesia as a measure to stop over usage of pesticides by farmers to keep away hopper pests affecting rice crops (FAO, 2019). It is a skill development concept which trains farmers on sustainable agriculture practices. Since its inception, the concept has gained popularity worldwide with many countries including India, who in 1993 adopted the idea. It is under the National Food Security Mission and nationally executed by the Ministry of Agriculture and Farmer's Welfare (MoAFW, 2019).

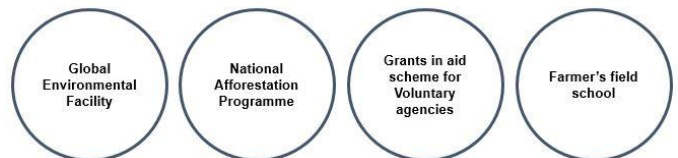


Fig. 1. Major Sustainable Land Management (SLM) programmes and schemes in India  
 Developed by Author referring to (MOEF, 2019), (NAP, 2018, pp. 1-2), (NAEB, 2018), (MoAFW, 2019)

**B. Objective B\_ Overview of Challenges**

The overall challenges have been categorised into two sets: general global challenges associated with the implementation of SDG's and case specific challenges related to goal 15 in India.

When it comes to global challenges; the SDG's are **not legally binding**; however, the countries are only expected to take ownership to achieve the goals through individual national framework. This is not enough to ensure full responsibility and accountability. Not just this, but also **resource mobilization** is a cause of concern due to the complexity associated with the involvement of a number of sectors and various levels: public private, domestic and international (UN, 2019).

The SDGs have repeatedly failed to demand the full realization of human rights; which can only be achieved by a humongous role-back of **international and intra-national inequalities** (CDN, 2018, p. 10).

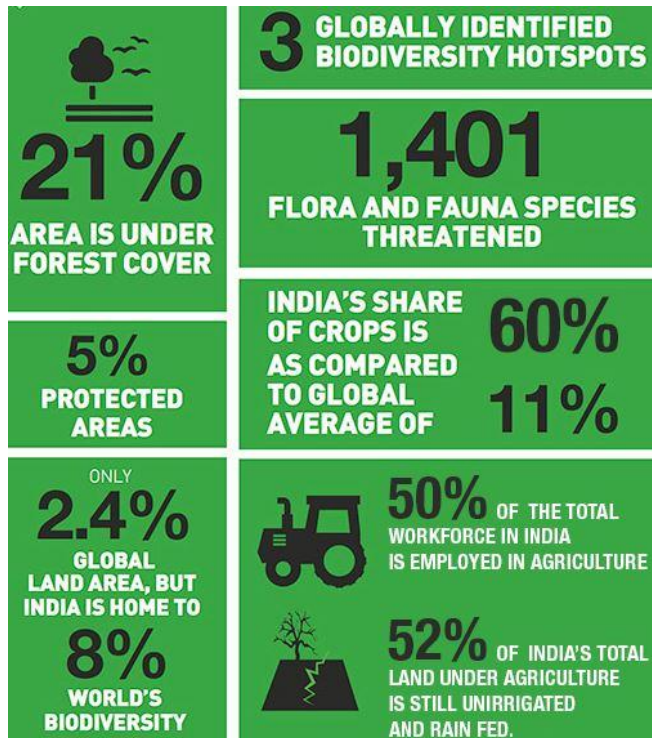


Fig. 3. Reasons why India plays a strategic role for achieving Goal 15 targets [18]

Apart from the numerous reasons mentioned in the picture above as to why India plays a strategic role; there are other challenges especially at the implementation stage. **Programme A Country Partnership Programme** is based on an international network, thus requiring various level institutional coordination and support. Other case specific implementation challenges include the fact that the two **Programmes B and C; National Afforestation Programme and Grants in aid Scheme for Voluntary agencies** are quite similar to each other; the former involves community participation's for afforestation and the latter provides funds to organizations carrying out afforestation related activities. *Programme B* is carried out by *Forest Department Agencies (FDAs)* and *Joint Forest Management Committees (JFMCs)*; whereas *Program C* is by *National Afforestation and Eco-Development Board (NAEB)*. It is not necessary to have two programmes with numerous responsible institutions; with such similar outcomes. When it comes to the **Programme D**; concept or scheme of *Farmers Field School*, the major challenge is the fact that India is a vast country with various geographical conditions and climatic zones. This leads to having area and case specific targets for the concept to be feasible. Since it is federal country with a decentralized

governance system, the state governments have an active say in the concept by having state ministries and state related plans which may not necessarily be in line with the union government vision. It is not just the *Ministry of Agriculture and Farmer's Welfare* at the National level, but also other ministries such as *Ministry of Human Resource Development* under which is the *Department of Higher Education and Literacy*; *Ministry of Women and Child Development* who among others have conflicts of interests in concepts such as the *Farmers Field School*. Other challenges are competing interests and how it is difficult to make trade-offs due to the linkages and synergies with other goals (more of which is mentioned in the next objective).

### C. Objective C\_Linkages and Synergies

**Goal 15** measures like all other goals has interdependencies; which is crucial for better implementation and overall understanding of the UN vision. Zero hunger and food security under **goal 2** is directly dependent on effective land use management. The sustainable use of land for agriculture is crucial to achieve the former goal. Continuous damage to ecosystem and natural environments has a direct negative impact over a long on the economic growth (**goal 8**). Zero hunger and life on land are directly linked to responsible consumption and production (**goal 12**).

It is important to check for cross-cutting issues for a country like India, where agriculture and related sectors are a primary contributor to the country's economy and nearly half the population's income is dependent on it. Furthermore, sustainable cities and communities (**goal 11**); and industries and infrastructure (**goal 9**) need to consider the environment aspects of land/water usage and management (Bhamra, Shanker, & Niazi, 2015, pp. 189-190).

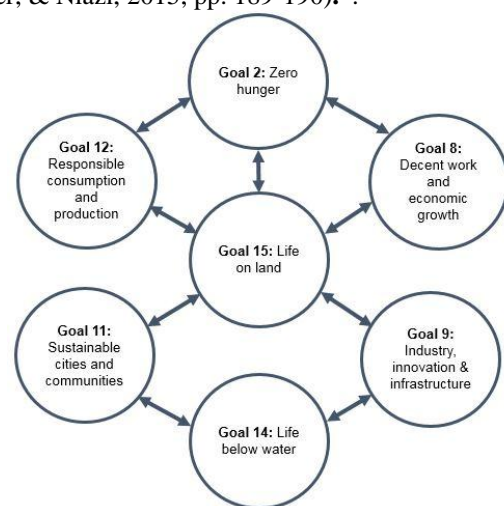


Fig. 4. Interdependencies between Goal 15 and other goals Developed by Author referring to (Bhamra, Shanker, & Niazi, 2015, pp. 189-190)



It is crucial to understand the co-benefits associated with these linkages in order to avoid competing interests and conflicts leading to trade-offs; which are however inevitable. For example, cutting down of forests for agricultural production will lead to loss of biodiversity.

Intensifying agriculture will lead to increased load on water resources and switching of food crops to biofuel production (energy sector) may lead to food security issues (Patterson, 2015). The type of synergies and linkages are not just unique or case specific to the context of India, but is a similar phenomenon observed worldwide.

#### D. Objective D\_Suggested Measures

Achieving the SDGs requires an **integrated institutional framework** which supports a more coordinated approach for operationalizing the 2030 agenda (Nunes, Lee, & O'Riordan, 2016, p. 1). It requires integrative horizontal and vertical governance with clear roles and responsibilities by encouraging all stakeholder's participation in planning, design and implementation phases. This way all four mentioned programmes along with other related programmes can be implemented more effectively with lesser conflict of interests. Next, there is a need to establish **innovative communicative strategies** to make the general public aware of the goals and targets (Concord, 2016). This could be in the form of encouraging public to engage in social enterprises and cultural engagements (Pearson, 2016, p. 4). *The Farmers Field School* is one such example, however there is a need to refine the existing complex constitutional network to make it more integrated and cooperative. Another possibility is exploring the potential of social media to improve people's lives. The third suggestion is **mainstreaming biodiversity and ecosystems in all sectors** and across all sectors (Lebada, 2018). By doing so, the linkages and synergies can be better understood in order to balance the trade-offs associated with it. **Encouraging through Business Leadership** is another solution where top-level leadership commitment can motivate employees to ensure and support for sustainable practices (Blueprint, 2019). It is corporate strategy which can be achieved not just by eco-entrepreneurs or climate entrepreneurs but also by other business or corporate enterprises too.

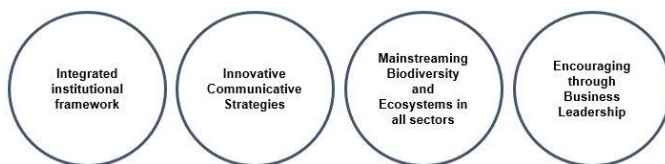


Fig. 5. Suggestive measures

Developed by Author referring to (Nunes, Lee, & O'Riordan, 2016, p. 1), (Concord, 2016), (Lebada, 2018)

#### IV. RESEARCH LIMITATIONS AND FURTHER RESEARCH

The four objectives mentioned are just an overview approach to study briefly what are the current practices and how it can be improved. The research has been done using limited research tools such as literature review and desktop research. Further research using other research tools is required to more broadly understand the pros and cons of this goal. For **objective A**, not all the current programmes and practices are mentioned; only the most important ones are highlighted. In order to better understand other possible linkages or synergies along with the associated challenges through **objectives B and C**, further investigation and fact-finding is suggested. Furthermore, the synergies highlighted are only based on the common targets and direct or in-direct influence of one goal's objectives on the other. Other possible synergies can be established with *goal nos. 1: no poverty, 3: good health and well-being, 10: reduced inequalities and 13: climate action*. The paper however doesn't highlight the linkages in governance/ organizational structure, cross-sectoral financial dependencies and any other similar criterias of assessment. Similarly based on the other objective's outcomes, **objective D** also can be analyzed more in depth to suggest project or case-specific measures.

#### V. CONCLUSION

Not just goal 15, but all the SDGs require a very level of cooperation among all stakeholders with a strong and consistent political commitment. A number of publications in recent years have mentioned about the positives and the negatives (including how it can be further improved). Goal 15: Life on Land is one of the most important goals as it is directly or indirectly correlated with atleast 10 other goals mentioned in the *linkages and synergies; & research limitation and further research* sections of the paper. In order to achieve the desired targets by simultaneously addressing co-benefits, more effective measures are required.

#### VI. ABBREVIATIONS

MOEF – Ministry of Environment, Forest and Climate Change  
 SDGs – Sustainable Development Goals  
 SLM – Sustainable Land Management  
 UN – United Nation

#### VII. ACKNOWLEDGEMENT

I would like to thank Prof. Dr. Rudolf Schäfer (Dean) and M. Sc Papon Dev (Research Associate) at Urban Development Department of Technische Universität Berlin for giving me



the opportunity to work on this research topic as a part of Land Management course submission.

### VIII. REFERENCES

[1] Bhamra, A., Shanker, H., & Niazi, Z. (2015). *Achieving the Sustainable Development Goals in India; A Study of Financial Requirements and Gaps*. New Delhi: Technology and Action for Rural Advancement; A Social Enterprise of Development Alternatives Group.

[2] Blueprint. (2019, 2 27). *How business leadership can advance Goal 15 on Life on Land*. Retrieved from Blueprint: <http://blueprint.unglobalcompact.org/sdgs/sdg15/>

[3] CDN. (2018). A Critique of the Sustainable Development Goals' Potential to Realize the Human Rights of All: Why being better than the MDGs is not good enough. CDN.

[4] Concord. (2016, 2 8). *Recommendations for the implementation of the Agenda 2030*. Retrieved from Concord Europe: <https://concordeurope.org/blog/2016/02/08/recommendations-for-the-implementation-of-the-agenda2030/>

[5] DESA. (2019, 2 21). *SUSTAINABLE DEVELOPMENT GOAL 15*. Retrieved from United Nations: <https://sustainabledevelopment.un.org/sdg15>

[6] FAO. (2019, 2 24). *Farmer Field School*. Retrieved from Food and Agricultural Organization: <http://www.fao.org/3/ad487e/ad487e02.htm>

[7] FRI. (2019, 2 23). *The Institute*. Retrieved from Forest Research Institute, Dehradun: <http://fri.icfre.gov.in/the-institute/>

[8] Lebada, A. M. (2018, 5 22). *SDG 15 Experts Discuss Drivers, Solutions to Biodiversity Loss*. Retrieved from SDG Knowledge Hub: <http://sdg.iisd.org/news/sdg-15-experts-discuss-drivers-solutions-to-biodiversity-loss/>

[9] MoAFW. (2019, 2 24). *Ministry of Agriculture and Farmer's Welfare*. Retrieved from Government of India: <http://agriculture.gov.in/>

[10] MOEF. (2019, 2 23). *SLEM Programme*. Retrieved from Ministry of Environment, Forest and Climate Change; Government of India: <http://www.moef.nic.in/division/slem-programme>

[11] NAEB. (2018). *Guidelines for Financial Assistance during 10th Plan period*. New Delhi: National Afforestation & Eco-Development Board.

[12] NAP. (2018). *OPERATIONAL GUIDELINES FOR THE TENTH FIVE-YEAR PLAN*. New Delhi: Ministry of Environment, Forest and Climate Change.

[13] Nunes, A. R., Lee, K., & O'Riordan, T. (2016). The importance of an integrating framework for achieving the

Sustainable Development Goals: the example of health and well-being. *BMJ Global Health*.

[14] Patterson, J. (2015, 8 4). *3 challenges facing the UN's Sustainable Development Goals*. Retrieved from World Economic Forum: <https://www.weforum.org/agenda/2015/08/3-challenges-facing-the-uns-sustainable-development-goals/>

[15] Pearson, V. (2016). *Innovation Communications Strategy*. Oxford: University of Oxford.

[16] UN. (2019, 2 23). *The Sustainable Development Agenda*. Retrieved from United Nations Sustainable Development Goals: <https://www.un.org/sustainabledevelopment/development-agenda/>

[17] UNDP. (2019, 2 21). *Goal 15: Life on land*. Retrieved from UNDP India: <http://www.in.undp.org/content/india/en/home/post-2015/sdg-overview/goal-15.html>

[18] UNIndia. (2019, 2 23). *SDG 15: Life On Land*. Retrieved from United Nations India: <http://in.one.un.org/page/sustainable-development-goals/sdg-15/>

### IX. ANNEX

#### A1. Targets for Goal 15

1	By 2020 ensure conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements
2	By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests, and increase afforestation and reforestation by x% globally
3	By 2020, combat desertification, and restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation neutral world
4	By 2030 ensure the conservation of mountain ecosystems, including their biodiversity, to enhance their capacity to provide benefits which are essential for sustainable development
5	Take urgent and significant action to reduce degradation of natural habitat, halt the loss of biodiversity, and by 2020 protect and prevent the extinction of threatened species
6	Ensure fair and equitable sharing of the benefits arising from the utilization of genetic resources, and promote appropriate access to genetic resources
7	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



Indicators list for Goal 15  
 (DESA, 2019)

<b>8</b>	<i>By 2020 introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems, and control or eradicate the priority species</i>
<b>9</b>	<i>By 2020, integrate ecosystems and biodiversity values into national and local planning, development processes and poverty reduction strategies, and accounts</i>
<b>a</b>	<i>Mobilize and significantly increase from all sources financial resources to conserve and sustainably use biodiversity and ecosystems</i>
<b>b</b>	<i>Mobilize significantly resources from all sources and at all levels to finance sustainable forest management, and provide adequate incentives to developing countries to advance sustainable forest management, including for conservation and reforestation</i>
<b>c</b>	<i>Enhance global support to efforts to combat poaching and trafficking of protected species, including by increasing the capacity of local communities to pursue sustainable livelihood opportunities</i>

Targets list for Goal 15  
 (Bhamra, Shanker, & Niazi, 2015, pp. 189-190)

**A2. Indicators list for Goal 15**

<b>No.</b>	<b>Indicators</b>
<b>1.1</b>	<i>Forest area as a proportion of total land area</i>
<b>1.2</b>	<i>Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type</i>
<b>2.1</b>	<i>Progress towards sustainable forest management</i>
<b>3.1</b>	<i>Proportion of land that is degraded over total land area</i>
<b>4.1</b>	<i>Coverage by protected areas of important sites for mountain biodiversity</i>
<b>4.2</b>	<i>Mountain Green Cover Index</i>
<b>5.1</b>	<i>Red List Index</i>
<b>6.1</b>	<i>Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits</i>
<b>7.1</b>	<i>Proportion of traded wildlife that was poached or illicitly trafficked</i>
<b>8.1</b>	<i>Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species</i>
<b>9.1</b>	<i>Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020</i>
<b>a.1</b>	<i>Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems</i>
<b>b.2</b>	<i>Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems</i>
<b>c.3</b>	<i>Proportion of traded wildlife that was poached or illicitly trafficked</i>

# IJEAST

INTERNATIONAL JOURNAL  
OF ENGINEERING APPLIED SCIENCE  
AND TECHNOLOGY

## ABOUT IJEAST

International Journal of Engineering Applied Science and Technology (IJEAST) is a peer-reviewed, open access journal that publishes high-quality research papers in the field of Engineering, Applied Science and Technology.

IJEAST aims to provide a platform for researchers, academicians, and professionals to share their innovative ideas, research findings, and practical experiences with the global scientific community.

## FOCUS AREAS

- Engineering
- Applied Science
- Technology
- Innovation & Development
- Interdisciplinary Studies



### PEER REVIEWED

All submissions are rigorously peer reviewed to ensure quality.



### OPEN ACCESS

Free and unrestricted access to research for all.



### GLOBAL REACH

Connecting researchers and professionals worldwide.



### TIMELY PUBLICATION

We ensure a swift and efficient publication process.



For more information, visit our website  
[www.ijeast.com](http://www.ijeast.com)



INTERNATIONAL JOURNAL  
OF ENGINEERING APPLIED SCIENCE  
AND TECHNOLOGY

✉ [editor@ijeast.com](mailto:editor@ijeast.com)

🌐 [www.ijeast.com](http://www.ijeast.com)

📍 India



2455-2143