सत्यमेव जयते

अসম চৰকাৰ

**Government of Assam
Transformation and Development Department**

ASSAM AGENDA : 2030

Strategies and Actions for Achieving
Sustainable Development Goals

**Centre for Sustainable Development Goals
Assam Administrative Staff College**

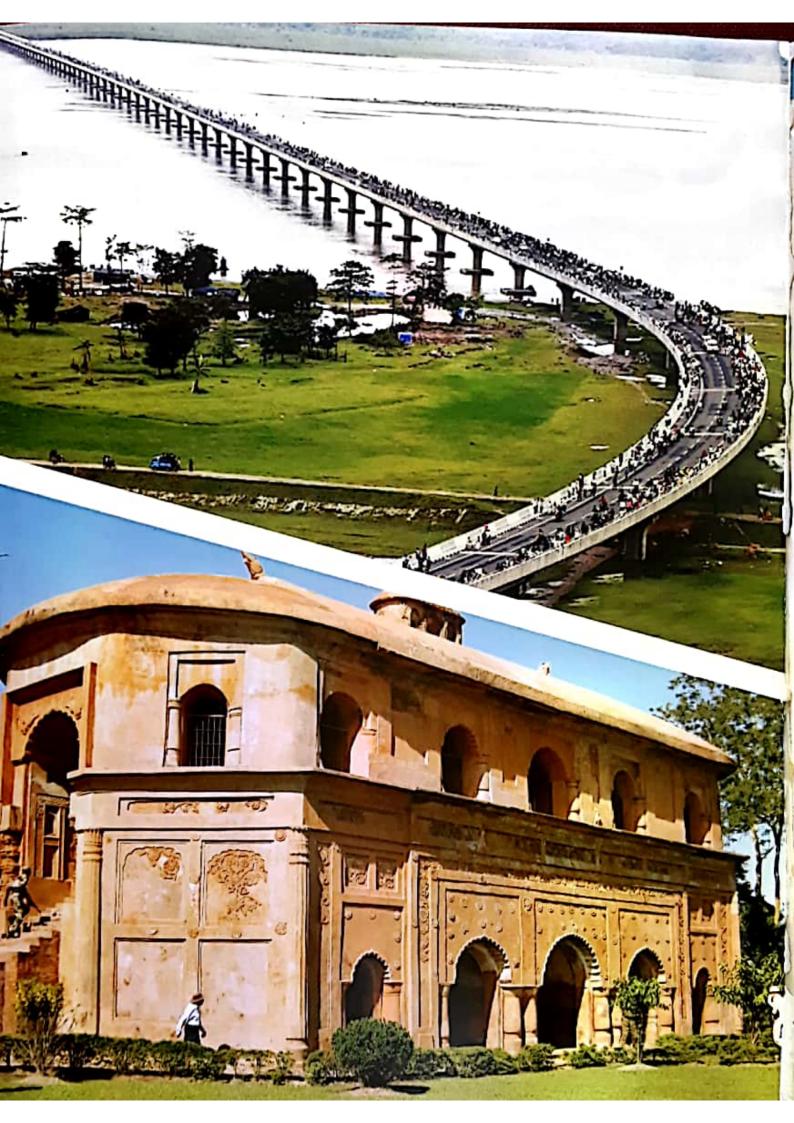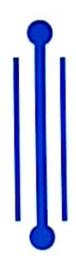**October 2018**

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ASSAM AGENDA : 2030

Strategies and Actions for Achieving Sustainable Development Goals

Centre for Sustainable Development Goals
Assam Administrative Staff College
Transformation and Development
Department, Government of Assam

October 2018

Sarbananda Sonowal

Chief Minister, Assam
Guwahati

Dispur
14.2.2018

MESSAGE

I am happy to know that the Centre for Sustainable Development Goals under the guidance of Transformation and Development Department, Govt. of Assam has prepared "Assam Agenda 2030: Strategies and Actions for Achieving Sustainable Development Goals" document in consultation with various stakeholders.

As the document outlines strategies to achieve Assam Vision 2030 and finds out ways to build an environment of sustainable development through positive interventions at different levels; it is imperative for all stakeholders to come up with invaluable inputs for covering some of the most important indexes of sustainable development goals of Assam like livelihood, quality education, health for all, gender equality, agriculture, economic growth etc for effectively empowering all sections of the society.

I extend my best wishes to Centre for Sustainable Development Goals for this endeavour and hope the document would be successful in fulfilling all its objectives.

(SARBANANDA SONOWAL)

DR. HIMANTA BISWA SARMA, Ph.D. LLB
Minister, Assam

Finance, Planning & Development, Health & F.W., Education, Tourism, Guwahati Development, Cooperation, Handloom & Textile (Khadi & Village Industry) Pension & Public Grievances.

सत्यमेव जयते

Message

On 25th of September, 2015, world leaders adopted 17 Sustainable Development Goals at the United Nations with 169 targets to be achieved by 2030 that marked the shift from the Millennium Development Goals. These goals and targets came into force from the 1st of January, 2016. Assam was one of the first states not only in India but the entire world to adopt the Sustainable Development Goals as a part of our development strategy envisioning Assam's future. This document 'Assam Agenda: 2030' will serve as a strategic development plan for all the departments to work coherently towards the achievement of the Sustainable Development Goals in the state.

'Assam Agenda: 2030' has been prepared after extensive discussions and deliberations based on the 7 years Strategic Plan and 3 years Action Plan (SPAP) and 9 conclaves that were held by the Centre for SDGs and the Transformation and Development Department, in association with the various departments. I congratulate them for the tremendous work done in bringing forth this document for paving the way towards the achievement of the goals in Assam.

'ASSAM AGENDA: 2030' focuses bringing forth convergence between departments and highlights innovative means and attempts to achieve the ambitious targets through systematic planning. In terms of financial planning adequate financial resources need to be planned for achieving the SDGs by 2030. In the Health sector, some of the major interventions proposed are strengthening health systems and promoting access to basic services, specific health interventions critical for Assam like reducing MMR, IMR and under 5 mortalities etc., addressing health deprivations through targeted support for deprived areas and groups, institutional reforms among others. In education sector, special focus is laid on expanding access to education for all, improving quality and efficiency of public services in education, fostering technological innovations and policy changes and organizational reforms to facilitate better service delivery. The document comes out with clear cut strategies for resource mobilisation and monitoring the progress of implementation through selected indicators using advance technology.

Assam is already undertaking a number of projects and implementing schemes to improve the socio-economic as well as the environmental condition prevailing in the state. Through this document, we aim to augment our efforts for the achievement of the Sustainable Development Goals in the state by taking on board all the stakeholders involved. Our Government is fully committed to achieving these goals by 2030.

(HIMANTA BISWA SARMA)

स्वच्छ भारत
एक कदम स्वच्छता की ओर

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চন্দ্ৰমোহন পাটোৱাৰী
মন্ত্ৰী
পৰিবহণ, উদ্যোগ আৰু বাণিজ্য,
সংসদীয় পৰিক্ৰমা, অসম

Chandra Mohan Patowary
Minister
Transport, Commerce & Industry,
Parliamentary Affairs, Assam

Dispur,
06.02.2018

MESSAGE

Assam has been a frontrunner for integrating the Sustainable Development Goals as part of the development planning process of the state. As one of the first states in the country to came up with a Vision and Strategic Architecture Document and aligning its work to the international goals, the Government of Assam has received widespread appreciation.

Taking forward the same objective, "ASSAM AGENDA 2030" takes the vision forward to specify the goals and targets to be achieved by the different departments, to bring convergence in their work. In order to achieve these goals the departments need to work in tandem and bring greater coherence amongst themselves.

As the focus of the country shifts towards developing North East as a major industrial hub, there is a need for developing employment opportunities, promote economic growth, attract investments, etc., thus sustainably increasing the share of manufacturing in the gross state domestic product by 2030. There is also a need to promote inclusive and sustainable industrialization across the state with special focus on Micro, Small and Medium Enterprises (MSMEs).

I believe that this document will serve as a guide to all the departments in taking forward their work for the development of Assam and achieving our vision for 2030.

(Chandra Mohan Patowary)

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ATUL BORA
Minister
Agriculture, Horticulture & Food Processing
Animal Husbandry & Veterinary, UDD and T&CP
Government of Assam

ADVANTAGE ASSAM
India's expressway to ASEAN

MESSAGE

The Assam Agenda 2030 reflects the time bound vision of the State for becoming a Sustainable and Equitable State by 2030 leaving "no-one behind" in its pursuit. The document is a result of the hard work of the Government of Assam with the support of Centre for Sustainable Development Goals, Transformation and Development Department, UN agencies, research institutions and others. I would like to congratulate each and every member who has contributed in this document. It would not have been possible without their efforts.

The Agenda outlines clear targets for the goals and the resources needed for their proper implementation. This is essential as we must deliver outcomes at a much faster pace and more efficiently. This document will be an effective guide to Government Departments and all stakeholders for the effective implementation of SDGs in the State. I also hope that in this process, we will be able to create a harmonious space for all citizens of the State by ensuring peace and promoting growth in the vital sectors of the economy like agriculture, animal husbandry etc. as well as make urban and rural spaces more sustainable to live by 2030. This will require a multi pronged approach which is evident in the document from expansion of agriculture to soil mapping and shifting to renewable forms of energy which is indispensable for a sustainable future for all.

I hope that by 2030, Assam will be high up on the development ladder and be at par with all developed states of the world.

Date : 12th February, 2018   (ATUL BORA)

ADVANTAGE ASSAM
India's expressway to ASEAN

MESSAGE

It is a matter of great pleasure to know that the Centre for Sustainable Development Goals and the Transformation and Development Department has prepared the "Assam Agenda-2030" to materialise the dream of the Hon'ble Prime Minister 'Sabka Saath, Sabka Vikash' which will be achieved through the successful implementation of the SDGs in Assam.

I am also pleased to learn that the "Assam Agenda-2030" transform the cities into smart and sustainable cities with creation of infrastructure and improvement of quality of roads and transportation with expanded networks across the state. I hope the "Assam Agenda-2030" compiled with the inputs of diverse sectors, ranging from State Departments, UN Agencies and the Centre for SDG etc. will highlight the importance of sustainability through visionary planning.

I wish this ambitious journey all the success and hope that with the implementation of the SDGs, the people of Assam will reap the benefits and the good results will be visible much before 2030.

(Parimal Suklabaidya)

RANJIT DUTTA
Minister
Irrigation, Handloom, Textiles & Sericulture
(Except K S VI) Assam

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MESSAGE

It is a matter of great pleasure that the Centre for Sustainable Development Goals (SDGs) under the guidance of the Transformation and Development (T&D) Department in the Government of Assam has prepared "Assam Agenda 2030: Strategies and Actions for Achieving Sustainable Development Goals" document which is being published soon. This document basically deals with strategies and actions needed to achieve Assam Vision 2030. It is a matter of pride for Assam to be the first State in India to dream of the future of the State, based on the United Nations Sustainable Development Goals. The Departments of Irrigation, Handloom, Textiles and Sericulture will ensure proper utilisation of the State's resources for economic growth, livelihood generation thereby empowering citizens of the State.

The State of Assam is the third in rank in production of silk yarn and there is enough potential to harness the skill and knowledge of the weavers to increase production. Since 70% population is dependent on agriculture, there is a need to focus on livelihood diversification and promoting irrigation and other facilities for assisting the farmers in the State.

The Centre for Sustainable Development Goals has been formed as a dedicated think tank to take forward the work of the SDGs in Assam. All departments have worked together with the Centre for achieving the desired goal.

I hope all the citizens and organisations in the State will lend their full support to the grand vision of the Hon'ble Chief Minister towards making Assam a State at par with the developed countries of the globe.

(Ranjit Dutta) 9/2/2018

Keshab Mahanta

MINISTER
Water Resources
Science & Technology and
Information Technology, Assam
Dispur, Guwahati 781006

Message

In the 21ˢᵗ Century, the use of science and technology and the promotion of new inventions and innovation in agriculture, health, education, security systems is a prerequisite for Assam to fulfill the Sustainable Development Goals. The onus now is on creating future ready governance for better transparency and functioning of governing platforms. The use of Science and Technology as evident from the Assam Agenda 2030 will percolate down from the highest to the lowest level of governance systems.

My heartiest congratulation to the proficient team of Centre for Sustainable Development Goals and the Transformation and Development Department for their commendable efforts in preparing the Assam Agenda 2030. The document itself is one of the initial steps towards embarking on the SDG journey. I assure that the Ministry of Science and Technology will provide its assistance to the departments wherever needed for strengthening existing plans, and planning new schemes to make Assam a booming economy coupled with effective implementation by 2030.

(KESHAB MAHANTA)

Pallab Lochan Das
Minister of State (Ind.)
Labour Welfare, Tea Tribes Welfare,
Revenue & Disaster Management and
Power, Assam.

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e-mail ID : pallablochandas@gmail.com

Message

I am happy to learn that an important an document namely- "Assam Agenda 2030: Strategies and Actions for achieving Sustainable Development Goals" will be published by the Centre for Sustainable Development Goals under the guidance of the Transformation and Development Department, Government of Assam. I would like to congratulate the Centre for Sustainable Development Goals and the Transformation and Development Department for the successful preparation of this important document. The document will lay down targets and guidelines for all departments to collectively work upon for the achievement of the goals in the context of Assam.

I wish the T & D Department and Centre for SDG all success in their endeavour and hope that every department concerned will make their full potential to achieve the targets mentioned therein.
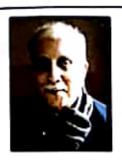
(Pallab Lochan Das)

Dipok Kumar Barthakur

Vice-Chairman
State Innovation & Transformation Aayog, Assam
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Date...28|03|2018

-: MESSAGE :-

'ASSAM AGENDA: 2030' is a visionary document that attempts to highlight the challenges ahead in the roads towards achieving the Sustainable Development Goals in the state and also tries to present necessary steps and ways to overcome those challenges. It provides goal specific targets for different departments to work upon for the achievement of the goals in Assam.

The Government of Assam has been a pioneer in trying to align its work in line with the Sustainable Development Goals. It stands as the first state in the country to have prepared a vision document based on the goals, receiving widespread appreciation and recognition for the same.

The State Innovation and Transformation Aayog (SITA) is trying to bring in innovation and transformation in the governance processes of the state, particularly in the local governance processes. It is also concerned with the development of industries and entrepreneurship in the state among many other important functions. The Sustainable Development Goals are at the core of the work that SITA is mandated to do and therefore any step towards the attainment of the goals is of vital importance to SITA and its functioning. We will co-ordinate with the various departments and try to keep track of the progress made by them vis-a-vis the aims and targets mentioned in this document to ensure that the rate of progress and development in the state accelerates to unprecedented levels by following the path shown by the Sustainable Development Goals.

I highly appreciate the work done by the Centre for Sustainable Development Goals and Transformation and Development Department, in bringing forth this document after many rounds of rigorous discussions with different stakeholders. I hope this document is diligently followed by the departments and all other concerned individuals and entities to set Assam on the road towards becoming one of the top states of the country.

(Dipok Kr. Barthakur)

Alok Kumar, IAS
Chief Secretary

GOVERNMENT OF ASSAM
Block-'C', 3rd Floor,
Janata Bhawan, Dispur,
Guwahati-781006

MESSAGE

It gives me immense pleasure in presenting the Assam Agenda 2030: A Strategic Development Plan. The Assam Government has been a frontrunner for SDG planning and policy orientation.

The Assam Agenda 2030 is the culmination of nearly two-year long process, which highlights the path for Assam to achieve the 17 Sustainable Development Goals by 2030. It was also a result of partnerships and support provided through various UN agencies such as UNDP, Unicef, WHO and other NGOs both regional and national, academic institutions, experts and citizens who participated in developing the Assam Agenda 2030. This document reflects a, deeper understanding on what are the current developmental challenges for the state and how we intend to move forward in achieving and overcoming all hurdles to ensure peace, justice, inclusiveness and equality for all by 2030.

The Assam Agenda highlights the path forward by highlighting the most important issues in the state and developing timelines for achieving the same. It also elucidates the strategies that need to be undertaken within a target period and the outcome of these plans and strategies that will define the course of development of Assam.

I appreciate the efforts made by the Centre for Sustainable Development Goal, Assam and the Transformation and Development Department, in bringing together all departments to take forth the common agenda for development of Assam.

I am glad to see that the document stands out for its clear vision and simplicity. The Vision which was set forth in July 2016 through the 'Assam 2030: Our, Dream, Our Commitment' shall be realized through the strategic interventions highlighted in this document. This historic document, which is the first of its kind, will pave the way for Assam's developmental journey and will bring forward the principle of 'partnering everyone for everyone's development' in Assam.

(Alok Kumar) 01.X.2018

October 01, 2018.

Rajiv Kumar Bora, IAS
Additional Chief Secretary

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Foreword

The Government of Assam has adopted the Sustainable Development Goals as their developmental strategy by a Government Notification in December 2015.These Goals are inclusive in nature and aim to combine social, economic and environmental aspects as key elements of development policy. Since they provide a pathway to a sustainable and equitable future that will considerably contribute to the well being of future generations, progress towards the achievement of SDGs is vital.

The SDGs are universal in nature and work towards bringing the most marginalised groups and communities into the fore-front of development ensuring that their voices are heard in the journey towards achieving a more sustainable future. The SDGs work towards promoting a circular economy model which promotes the principles of 'restoration and regeneration' using innovative tools and methods in the process.

'Assam Agenda 2030:Strategies and Actions for achieving SDGs in Assam' mirrors the way forward for all departments to engage in time bound, action oriented and all inclusive development programmes that are focused towards the communities and regions left behind in our developmental journey so far. This document is an outcome of a series of consultations and deliberations which were organised around nine thematic areas covering the 17 SDGs. Each chapter in 'Assam Agenda 2030' highlights the key challenges and proposes strategies for overcoming these challenges through appropriate action plans to meet a series of triennial targets aimed at realising the vision for all the SDGs. It recognises the need for working and planning in a consultative manner through cross-departmental sharing of knowledge and resources, with convergence and collaboration to achieve larger objectives being the main strategy for achieving the SDGs.

Now, with the adoption of Assam Agenda 2030 by Government of Assam, all departments in the Government shall have to reorient their budgetary allocations and plans and programmes in a synergised manner to achieve the ultimate goal of "No one is left behind" as set in Assam Vision 2030. Likewise, the Government expects all the stakeholders to enthusiastically support the Assam Agenda 2030 for successful implementation of SDGs in the State.

(Rajiv Kumar Bora)

Preface

Assam Agenda 2030 is not only a development strategy to achieve the vision of Assam 2030 aiming to attain the Sustainable Development Goals by 2030 – but a strategy for profound change in the functioning of government and society.

Theimprovements envisaged to achieve these Goals –which the Government is determined to realize– in all areas of public services both in the scale of delivery of services as well as their quality are enormous and require a much faster pace of advancements than ever experienced in the past. This will require an entirely new and different approach to providing services to the public.

Thus to attain good health and well-being for all; ensureuniversal access for students to quality education at all levels; guarantee theprovision of basic amenities to the entire population such as housing, clean water, sanitationand electricity;assure that all habitations in the state have clean air and unpolluted environments; that all communities live in peace and harmony without fear or insecurity– just to take a few of the aims from the vision of Assam 2030– will require a paradigm change in governance and public services delivery. Assam Agenda 2030 suggests how such change is to be brought about.

First, Assam Agenda 2030 requires that not just public servants, but also each and every citizen of the state, participate in the effort to achieve the grand vision of Assam Agenda 2030. Communities including all tiers of the Panchayati Raj Institutions and Urban Local Bodies; the private sector; students, youth and academics; and civil society will have to combine and scale up efforts manifold to achieve Assam 2030. This is one of the key requirements stressed in all chapters of the Agenda.

Second, Assam Agenda 2030 requires that the government and all stakeholders focus significantly more on improving efficiencies and finding new ways to do more with the same resources. The Agenda stresses crucially on the need to innovate, find and use new technology to improve quality and expand delivery of services. A culture of innovation and change has already been initiated by the Government and the Agenda emphasizes that this must be continued and intensified in the future so that tangible gains are increasingly realized from them in the years to 2030.

Finally, changes in policies, organizations and institutions, as immediately evident, are built into Assam Agenda 2030 in order to improve public functioning and encourage efficiencies, innovations and partnerships. Such changes will be necessary also on a continuous basis in the future as circumstances change and existing policies and institutions live out their usefulness. The state's governance system must be flexible enough to realize when changes to policies and institutions are called for and undertake such changes accordingly in the future.

Assam Agenda 2030 is prepared with the confidence that such changes will indeed be made. It has been developed fully in-house coordinated by the SDG Centre with the participation and support of a wide body of stakeholders within and outside the Government and through intense work and discussions over the last two years. It therefore has the full ownership of all stakeholders of the state and with it their determination to implement the Agenda and ensure that the far-reaching vision of Assam 2030 incorporating the SDGs is indeed fully realized.

Dr. Shiladitya Chatterjee

Adviser, Centre for SDGs

Acknowledgement

The Assam Agenda:2030 is the inhouse document of Transformation and Development, drafted by the Centre for Sustainable Development Goals after a long journey of about one year and half involving numerous consultations through departmental meetings, SDGs specific conclaves involving the leading experts from academic, educational institutions from the state and outside, professionals, civil society members, intelligentsia and experts from UN organisations like UNDP, UNICEF, WHO and ILO, based in Guwahati and Delhi, besides the state government officials from the civil secretariat and the directorates, who all contributed immensely for finalisation of the draft Assam Agenda:2030. The findings, analysis, the strategy recommendations and suggested action plans are based on strategic papers and action plans of the departments, under Government of Assam, which are envisioned to become, 'an important tool for achieving the targets set for the state in its vision 2030 document'.

The Centre for SDGs owes a lot to the successive leaderships of the Government of Assam since adoption of goals in UN General Assembly on 25 September, 2015, for adopting SDGs as future development framework for the state, which focus on 'no-one to be left behind' and 'Sab ka saath, sab ka vikas'.

We are indebted to the Mrs. T. Y. Das, IAS, the Chief Secretary, Assam and her predecessor Sri. V. K. Pipersenia for their continued inspirational, intellectual advice, guidance, thoughts from the date of adoption of SDGs as 'State's Developmental Framework', vide a Government Notification dated 28.12.2015 till date. The CSDGs feels privileged to receive all the support from both the Chief Secretaries and it would not have been possible to mobilise so much support in the state without their offices.

The CSDGs has been greatly benefitted with the experience and expertise of Sri K. V. Eapen, the former Additional Chief Secretary, Transformation and Development Department and presently Secretary to Government of India, Department of Administrative Reforms and Training and his successor Additional Chief Secretaries Sri V. B. Pyarelal and Sri Rajiv Kumar Bora, IAS. The contribution made by them in finalisation of Departmental Strategy and Action Plans and in mobilizing resource persons and all the support for organizing state level conclaves has been huge and acknowledged.

Dr. R. M. Dubey
Prof. & Head
Centre for SDGs

The Drafting Team

The draft 'Assam Agenda: 2030' was drafted by the following officials with the Centre for Sustainable Development Goals :

1. Dr. Shiladitya Chatterjee: Advisor, Centre for SDGs

2. Dr. R. M. Dubey: Prof. & Head, Centre for SDGs

3. Shri J. C. Phukan: Consultant, Centre for SDGs

4. Ms. Supriya Khound: State Technical Officer, UNDP

5. Mr. Anukriti Kaushal: State Technical Officer, UNDP

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Introduction

Assam Agenda 2030 provides the basic development strategy to realize the long term vision of Assam 2030: which sees an end to all categories of poverty and deprivations in Assam by 2030; good health for all people in the state, a well skilled, educated and fully employed youth population; a climate of enduring peace and stability; an environment being managed sustainably and in harmony with the needs and well-being of the population; and access to adequate resources to place the state on a rapid and sustainable growth path, ensuring a decent life for all and consistent with the motto *Sabka Sath, Sabka Vikas* with none left behind.

This vision, in line with the Sustainable Development Goals (SDGs), was adopted by Assam, early in 2016, soon after our Prime Minister, along with heads of all governments across the world met in the United Nations General Assembly to adopt and attain the SDGs. The Government of Assam was not only the first state government in India to adopt the SDGs, but also the first government anywhere in the world to do so.

Since adopting the SDGs, the Government of Assam set in motion an intensive participatory process to prepare the development strategy to achieve Assam 2030. Each department prepared after much internal discussions, a Strategy Paper and Action Plan (SPAP) which laid out a medium term 7-year strategy and an immediate 3-year action plan for the SDGs they contribute to, which would ensure that the state is firmly on the path to realizing the goals and targets of Assam 2030.

The seventeen SDGs were then grouped together into nine synergistic groups and day long conclaves were organized in 2017 for nine such groups where the concerned SPAPs were thoroughly discussed by all interested departments and stakeholders and improvements and suggestions were provided. Additional partnership conclaves were also held. The Centre for the Sustainable Development Goals (CSDG) then compiled the Assam Agenda 2030 based on the SPAPs and the conclave outcomes. Thus, Assam Agenda 2030 reflects the views and suggestions of a large body of stakeholders including the government and its agencies and non-state players.

Assam Agenda 2030 sets out the crucial interventions and actions needed to achieve the grand vision of Assam 2030. It establishes core monitorable outcome indicators with baselines and intermediate and final targets; its sets timelines for critical interventions and actions which also can be monitored. It will thus be the primary document used to monitor the state's progress towards Assam 2030.

Assam Agenda 2030 is intended to be a live document that will undergo changes and modifications with time and changing circumstances to which it must be adjusted. A thorough review of progress will be conducted and changes as necessary to the document will be carried out very three years to 2030.

Executive Summary
'Assam Agenda 2030': Strategies and Actions for achieving the SDGs

The Sustainable Development Goals (SDGs) are a set of seventeen goals which tackle some of the most critical challenges of twenty first century. The core principle of SDGs is to ensure economic and social growth keeping environment at the crux of developmental planning. These goals focus on including the most marginalized communities with the aim of 'no-one left behind'. The SDGs were adopted in January 2016 and the Government of Assam was the first state government in India and the world to adopt the SDGs into the state policy planning process. Subsequently, the Government of Assam established the Centre for Sustainable Development Goals as a think-tank to research, coordinate, train, spread awareness and understanding on issues related to SDGs across all levels and stakeholders in the state. It appointed the Transformation and Development Department as the main coordinating department and a SDG cell was created in the Department for aligning the states activities to SDGs.

The Government of Assam started the process of building capacities of the government officials through a series of trainings and workshops, since adopting the SDGs. As per the NITI Aayog directive the Government of Assam was asked to formulate three documents in relation to the SDGs, namely; i) Vision Document for Assam, ii) Seven-year Strategic plan for the state, and iii) Three-year action plan for the state. As per this mandate, the Government of Assam has already come out with a Vision Document in February 2016 and a Strategy and Architecture Document in July 2016. As directed by Niti Aayog, the seven-year Strategy Plan and three-year Action Plans (SPAPs) were developed by the departments through an intensive participatory process for each department. These SPAPs culminate into the formation of the Assam Agenda: 2030. To develop synergy and linkage between these SPAPs, the various departments were clubbed together into lead, supporting and cross-cutting departments for each relevant goal. Day long conclaves were organized in 2017 with the nine groups where the concerned strategies and actions were thoroughly discussed by all interested departments along with stakeholders. Thus, the Assam Agenda 2030 is a culmination of a two-year long process of trainings, discussions and deliberations, highlighting the path forward for the Government of Assam till 2030.

Overview of the Chapters: Each chapter in the Assam Agenda 2030 brings highlights a set of indicators with baselines and targets set for 2019-20, 2023-24 and 2030-31. The major strategic interventions proposed by the departments are highlighted along with technological inputs and innovations required, partnerships to be developed and requirements in terms of financial, infrastructural and human resources. The nine chapters in the document highlight the following:

Chapter 1 on Sustainable Development Goals (SDGs) 1 (no poverty) and 2 (zero hunger), takes into account the current baseline and proposes strategies for increasing and developing sectors which promote poverty alleviation, for instance increasing average rice yield from 2119 (2014-15) (kg/ha) to 4238 by 2030; by increasing agricultural growth and promoting commercialization through harnessing irrigation, promoting mechanization, ensuring access to improved seeds, enhancing soil conservation and promoting soil health cards, fostering e-governance systems, and strengthening internal revenue mechanisms. It highlights the need to reduce poverty from current 27.34%, 2016-17 (Poverty Head Count Ratio) to 0 by 2030; by strengthening anti-poverty measures by expanding MGNREGA to provide more employment in rural areas and promote other livelihood generation schemes, strengthen ICDS scheme to end under-nutrition and reduce cases of under-weight children, provide housing for all and protecting all vulnerable persons, women and children.

Chapter 2on SDGs 3 (good health and well-being) and 6 (clean water and sanitation) focuses on good health, well-being and access to basic services for all. It promotes strategies for addressing critical areas such as; increasing immunization from current 47% (2015-16) to 100% by 2030, reducing anemia among pregnant women from 45% (2015-16) to 0 by 2030, along with other essential health indicators for strengthening health systems. It highlights the need for strong health infrastructure and systems, develop human resources for health and ensure availability of medicines and consumables. Furthermore, it devises strategies for increasing household covered with sanitary toilet facilities from 52% in 2016 to 100% by 2019 for all and increasing home connection for drinking water supply to 100% by 2030, is stressed upon. Specific health interventions for reducing MMR from 300 (2011-13) per lakh to below 70 per lakh by 2030 and improve IMR and under 5 mortality in the state as per international standard norms. Reducing out of pocket expenditure by promoting health assurance schemes, free diagnostic facilities, reducing expenditure on drugs and medicines are critical. Developing institutional changes by organizational restructuring, data management and monitoring processes, capacity building, developing ICT for change and improving service delivery mechanisms are discussed in the chapter.

*Chapter 3 on SDG 4 (quality education)*highlights inclusive and quality education for all. It focuses on policy reforms and improving efficiency of public services in education. It highlights

the need to broaden vocational and skills based learning for expanding career choices especially among youth and increasing the number of institutions, for instance number of polytechnics from 10 (2016-17) to 31 (2023-24). It focuses on good quality education through early school education interventions by increasing 3+ pre primary children being provided ECE from 49.8% (2008) to 100% by 2030, bringing all out of school children into schooling and reducing dropout rates from 17% (2016-17) to 0 by 2030 and increasing retention rate from 79.4% (2016-17) to 100% by 2030 by expansion of secondary, higher and technical education and inculcating sports and other activities into an inclusive learning environment. The attempt would be to inculcate the habit of continuous learning among the students of the state. It discusses the need to build capacities, develop human resources, strengthen policy and build partnerships.

Economic, social and political empowerment for all is the primary focus for *Chapter 4 on SDGs 5 (gender equality) and 10 (reducing inequalities)*. The chapter focuses on reducing gender inequality, inequalities arising from social discrimination among women, children, people disabilities and for certain communities and groups where inequality is caused by geographical and location disadvantages. It highlights the need for economic empowerment through expanding education and promoting vocational education, expanding women's participation in the labour force and expanding access to resources and entrepreneurship. It discusses social empowerment for all by reducing all forms of violence and eliminating social evils such as child marriage and reducing the numbers of women between 20-24 years getting married before the age of 18 from 32.6% (2015-16) to 0 by 2030. It stresses on political empowerment through advocacy and political participation and increasing women's participation in state assembly from 6.35 (2016) to minimum 33% by 2023-24. It focuses on the most deprived communities and regions and on people with disabilities through a disaggregated database, expanding basic services such as public buildings accessible to persons with disabilities below 5% (2016-17) to 100% by 2030 and inclusive infrastructure development for all.

Chapter 5 on SDGs 7 (affordable and clean energy), 8 (good jobs and economic growth) and 9 (industry, innovation and infrastructure) focuses on economic growth by increasing Annual Rate of Growth of SGDP from 7.88% (2014-15) to 10% by 2030, through development of industries, agriculture and allied sectors, service sectors, entrepreneurship development, infrastructure development by promoting growth corridors, export facilities, and also focusing on micro, small and medium enterprises. It stresses on the need to create new knowledge products and innovative methods, based on research and incubation. Growth rate industry sector (constant prices) from 2.28% (2014-15) to 10% by 2030, by attracting investment along with a strong industrial policy promoting growth and development. Basic infrastructure development through access to clean energy, increasing proportion of households using electricity as the primary source of lighting from 37% in 2011 to 100% by 2019-20, promoting

micro-grids for reaching difficult areas, and production of sustainable energy through renewables is critical. Expansion of road networks which are safe, climate resilient, and ae maintained are essential for overall development.

Chapter 6 on SDG 11 (Sustainable Cities and Communities) focuses on building sustainable cities which are resilient and planned for natural disasters, with access to basic services such as adequate housing in urban areas where current gap of 32,00,000 (2016-17) is reduced to 2,24,000 by 2030, electricity gaps in street lighting which currently is at 150000 lights (2016-17) to less than 5000 by 2030 and similarly water, proper public amenities such as parks, connectivity in terms of proper roads and waste management systems are other essentials which need strengthening. It highlights the need for improved traffic planning, proper public transport facilities, upgradation of slums towards affordable housing for all and strengthening Urban Local Bodies (ULBs) for better implementation and monitoring of policies.

Chapter 7 on SDG 12 (sustainable consumption and production), 13 (climate action), 14 (life below water) and SDG 15 (life on land), focuses on Assam's environment and response to climate change. This chapter highlights the need for intensive forest management and wildlife protection through involvement of communities. The strategies are proposed to expand forest cover and quality of forest targeting more forest areas to under the category of very dense/ moderately dense forest with the aim to achieve growing stock of forest from 143.7 million cubic meters in 2016-17 to 300 million cubic meters by 2030-31; outlines measures towards mitigating effects of climate change especially against natural disasters and means for promoting suitable interventions for sustainable production and consumption especially in terms of agriculture, methane generation, reducing consumption of fossil fuels and decreasing energy intensity of the states' economy by increasing the proportion of renewable energy to the total energy generation/purchase from 2.08% to 40% by 2030. It also looks into sustainable technologies for construction and a pollution free Assam by 2030 through reducing solid waste, air, light and noise pollution.

Chapter 8 on SDG 16 (peace, justice and strong institutions), highlights the need for building peace, justice, good governance systems and strong institutions at all levels in the state. It emphasizes on effective policing with adequate personnel and infrastructure, implementation of MOITRI, providing safety and security to women and children by reducing rate of violent crime from 47.1 per lakh female population (2015-16) to less than 15 (2030-31), developing community participation and eliminating cyber-crime, strengthening criminal tracking networks and ending drug abuse. It also highlights the need to improving access to judicial services and providing legal assistance. Ensuring measures for increasing percentage of cases charge sheeted from 47% (2015-16) to 85% (2030-31) and reducing the number of under trial cases in courts.

Chapter 9 on SDG 17 (partnership for the goals) highlights the means for implementing the SDGs, especially in terms of financial planning to understand resource gaps and measures to fill these gaps by increasing the share of revenue collection within the state and other financial diversification measures. Promoting technology and innovations for all sectors and capacity building of all officials through international standard trainings and refresher courses. Developing and strengthening monitoring mechanisms in the state through availability of disaggregated data and a dashboard for monitoring all SDGs in the state.

Chapter 1
Eliminating extreme deprivations of poverty and hunger
Goal 1: Ending poverty in Assam by 2030
Goal 2: Zero hunger in Assam by 2030

Chapter 1

Eliminating extreme deprivations of poverty and hunger

Goal 1: Ending poverty in Assam by 2030
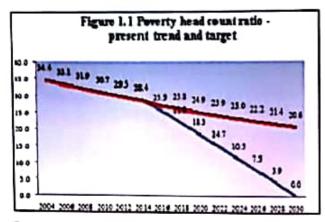
Goal 2: Zero hunger in Assam by 2030
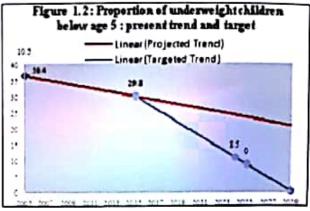
This chapter discusses the Sustainable Development Goals (SDGs) 1 and 2 as adopted by Assam.[1] As these two Goals are in many ways inextricably linked, with strong synergies and complementarities and with several common interventions necessary to address them, they are discussed together in this chapter. A major part of the interventions are subsumed within the state's *Chief Minister Samagra Gramya Unnayan Yojana* (CMSGUY) program which will provide strong impetus to achieving these two Goals.

1. Goals and targets.

The poverty head count ratio for Assam was estimated at 27.34 percent in 2015-16. This is much higher than the all-India average 20.74 percent and Assam also trails most of the northeastern states (other than Arunachal Pradesh and Manipur) in poverty incidence. Assam 2030 envisions a total elimination of extreme poverty requiring the headcount ratio be brought down to zero by 2030. This will require a much faster pace of poverty reduction than experienced in the past as can be seen from Figure 1.1. The poverty headcount ratio should decline by 6.7 percent annually from the baseline data of 2015 to meet the target by 2030 as against the annual decline rate of 1.9 percent experienced during the period 2004 to 2015.

Similarly, hunger remains a major problem in the state. Amongst children, the most vulnerable group in this respect, almost 30% below the age of 5, are undernourished. Although hunger in all probability persists in similar magnitude in the general population, good estimates are unavailable and child undernourishment can be taken as a proxy for estimating hunger in general. Like poverty, Assam has determined to eliminate hunger too by 2030. Also like poverty, however, the task is not likely to be easy as improvements given by past trends are insufficient and much greater effort than in the past will be necessary.

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[1] *Assam 2030: Our Dream, Our Commitment. Vision and Strategic Architecture Document of the Government of Assam.* Guwahati, 12 July 2016.

Figure 1.1 Poverty head count ratio - present trend and target

Figure 1.2: Proportion of underweight children below age 5 : present trend and target

Source: SPAPs of Panchayat and Rural Development; and Social Welfare Departments

Table 1.1: Major indicators and targets on poverty, hunger and food security

Indicators	Baseline 2016-17	Target 2019-20	Target 2023-24	Target 2030-31
Poverty Head Count Ratio (%)	27.34	20.2	10.5	0.0
Need for Housing Facility (% of HH)	40.8	30.2	19.4	0.0
Person-days generated under MGNREGA (lakhs)	9.75	40	40	40
Proportion of underweight children below 5 (%)	29.8 (2015-16)	18	10.5	0
Coverage of ICDS of state's target population (%)	94.0	98.0	100.0	100.0
Proportion of women age 15-49 who are anemic(%)	45 (2015-16)	30.6	16.2	0.0
Average rice yield (kg/ha)	2119 (2014-15)	3000	3500	4238
Cropping Intensity (%)	149	166	189	223
Distribution of soil health cards (proportion %) of total requirement of 272,000	34.3	100.0	100.0	100.0
Irrigation potential (all departments) created (lakh ha)	17.5	21	24	27.0
Total numbers of SHGs in NRLM (thousands)	89.7	321.7	418.21	418.21
Proportion total land affected by water logging, erosion and degradation (%)	20.4	15	8	0.0
Youth to be imparted skill training under NLRM (in thousand)	8200	30000	40300	
Production of pulses (Lakhs MT)	1.43	4.96	5.18	5.52
Production of oilseeds (Lakhs MT)	2.48	4.46	4.66	4.97
Per-capita fish consumption (kg/person/year)	9.0	11.0	15.0	20
Meat availability ('000 tonnes)/(as % of requirement)	49 (13.5)	150 (40.0)	300 (77.3)	405 (100.0)
Egg availability (million nos.)/(as % of requirement)	476 (8.0)	1500 (24.5)	4000 (63.0)	6624 (100.0)

Indicators	Baseline 2016-17	Target 2019-20	Target 2023-24	Target 2030-31
Egg availability (million nos.)/(as % of requirement)	476 (8.0)	1500 (24.5)	4000 (63.0)	6624 (100.0)
Milk production (million ltr)/(as % of requirement)	908 (36.2)	1300 (50.3)	1632 (60.9)	2794 (100.0)
Production of silk yarn (eri+ muga+mulberry)(MT)	2712.0 (2015-16)	2996	3786	7584
Proportion of handloom weavers with access to markets (%)	43.8 (2009-10)	55	75	100.0
Proportion of rural households using electricity for lighting (%)	62.1 (2015-16)	100.0	100.0	100.0
Total length of surfaced rural roads ('000 K.M.)	18.3	24	31.9	43.0
Proportion of own revenues of PRIs to total revenues(%)	11%	15%	20%	25%

Source: Departments' Strategy Papers and Action Plans (SPAPs)

The major indicators that will need to be closely monitored in this area is set out with baselines, 2030 targets and intermediate targets in Table 1.1 above.

1. **Major strategic interventions proposed**

A. Accelerating Assam's economic growth

The strategy to combat poverty and hunger in the state begins first by promoting faster growth of the state's GDP in order to promote employment and growth of incomes. As poverty in the state is concentrated disproportionately in rural areas[2] stepping up agricultural growth, which is the main occupation of the rural population, providing employment to 60% of rural residents, is essential.

Assam's growth rate of SGDP stood at 7.9% in 2014-15. The state aims at increasing this growth to at least 10% by 2025-26. Such growth is likely to be accompanied by structural change in the economy with migration of employment from primary sector to industry and services with higher productivity and incomes. This is essential for poverty reduction in the long term. More details on how higher economic growth is to be achieved may be seen in Chapter 5 which discusses the state's growth expansion efforts in depth.

B. Increasing agricultural growth and ensuring food security

Particularly for poverty and hunger elimination, stepping up agricultural growth from the current 4.5% and ensuring food security. The state's vision for agriculture is that of a vibrant sector which is an engine of growth for the state economy; provides food and nutritional security; supports farmers' socio-economic uplift and aspirations for a comfortable life; minimizes environmental degeneration; and helps the state in poverty eradication.

The state's strategy for agriculture envisages expansion of gross cropped area from 149% currently to 223% and doubling the productivity of principal crops such as rice (in which it is already self-sufficient and needs to maintain its current production level at around 60 lakh metric tonnes) and to meet its requirements in pulses and oil seeds (where it is deficient) to meet its food security needs by 2030. The strategy rests on the following main pillars:

(i) Irrigation. The state plans to increase irrigation potential from 17.5 lakh hectares currently to 27 lakh hectares by 2030. A major challenge that needs to be overcome is to hand over responsibility for maintenance of the irrigation works to Water Users' Associations (WUAs). It is planned to hand over all irrigation schemes ultimately to WUAs by 2030. To improve efficiency of irrigation systems, leakage proof canal system (using lined canals) are proposed to be introduced. Implementing the Command Area Development and Water Management (CADWM) Programme more effectively is also proposed to improve efficiency of the irrigation

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[2] *The Tendulkar Committee estimated for example that in 2009-10, the poverty headcount ratio was 39.9% in rural areas and 26.1% in urban areas. See Planning Commission's Press Note on Poverty Estimates 2009-10; available at http://planningcommission.nic.in/news/press_pov1903.pdf* [2]*India's average farm mechanization was 2.02 Kw/hectare (i.e equivalent to 2.7 hp/hectare) in 2013-14. Source: Transforming Agriculture through Mechanization. FICCI and Grant Thornton, 2015. Available at http://ficci.in/spdocument/20682/agrimach.pdf*

network. In order to eliminate erratic power supply, effort will be made to expand coverage of solar panels for all –shallow and deep – tube wells by 2023 utilizing the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) where feasible.

(ii) *Mechanization.*Productivity expansion will require greater mechanization. It is planned to nearly double the availability of farm power from the current level of 1.3 hp/hectare (which is less than half the Indian average[3]) to 2.3 hp/hectare by 2030.

As the average size of farms remains very low (1.10 hectares in 2010-11) which hampers mechanization. The program to encourage consolidation of holdings will be accelerated.

(iii) *Improved seeds.*While the state is self-sufficient in the production of certified paddy and oil seeds, it is deficit in pulse seeds. Under the Vision 2030, a seed production plan with the help of Assam Agricultural University for paddy, pulses and oil seeds to cater to the entire needs of the state will be developed by 2030. The current production and the future requirements of certified seeds to be met is given in Table 1.2 below.

Table 1.2: Production targets for certified seeds of principal crops				
	Baseline 2016-17	Target 2019-20	Target 2023-24	Target 2030-31
Requirement certified Paddy seed (MT)	53696	55448	57848	61664
Production (MT)	55000	55448	57848	110000
Requirement certified Pulse seed (MT)	9816	10122	10571	11265
Production (MT)	200	10122	10571	11265
Requirement certified Oilseeds (MT)	3600	3717	3883	4142
Production (MT)	3800	3717	3883	4300

Source: Agriculture Department SPAP

(iv) *Soil conservation and soil health.* Of the state's total land area of 74.4 lakh hectares, over 20 percent is either lying waste due to water logging or marshy conditions, or degraded or flood prone. A significant portion (not estimated) of the state's land area adjoining streams and rivers also suffers from bank erosion. The state plans to restore all these areas affected by various types of degradation or erosion by 2030 so that they can be put to productive use in agriculture or plantations.

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[3]*India's average farm mechanization was 2.02 Kw/hectare (i.e equivalent to 2.7 hp/hectare) in 2013-14. Source: Transforming Agriculture through Mechanization. FICCI and Grant Thornton, 2015. Available at http://ficci.in/ spdocument/20682/agrimach.pdf*

Two major constraints among others must be overcome. A significant portion of the degraded land is under encroachment that has to be tackled. Awareness has to be created also among the rural population and communities about the importance of the need for soil conservation and their active participation and support obtained for the state's efforts to restore degraded and eroded land to a productive state.

The productivity of the soil needs to be improved by ensuring that all farmers test their soil and apply the optimal quantities and proportions of fertilizers and nutrients. Arbitrary application leads to nutrients being wasted and raising the cost of cultivation. The government plans to distribute soil health cards (SHCs) to increase the coverage of farmers with such cards which stands currently at about a third of requirements (272,000 cards) to 100% by 2019-20. This will also the number of soil testing laboratories to be increased from the present 10 to 15 by 2019-20 and 26 by 2023-24 and all upgraded by then.

(v) Commercialization of agriculture and allied activities. This will involve action on several fronts. To ensure that farmers obtain adequate returns, clusters of crops based on production patterns and marketable surpluses must be identified and farmers groups or cooperatives for production and marketing promoted. It is proposed that 75% of farmers be covered by such groups by 2030[4]. To facilitate cheaper access to markets, existing warehouses, cold storages will be declared as sale and delivery points. To avoid distress sale, pledge financing by the Assam State Agricultural Marketing Board in addition to financial institutions will be organized. Timely action will be undertaken also for procurement of commodities at minimum support prices (MSP) for those commodities covered under the price stabilization scheme. For horticulture produce, the Market Intervention Scheme will be implemented. An awareness program will be undertaken amongst farmers and sufficient procurement centers established.

A modern and effective market information network is also essential. The state proposes to make use of the national e-NAM market portal and link to it. Dissemination of market related information will be scaled up by using mobile applications, SMSs etc. A massive awareness drive amongst farmers and other stakeholders about modern agricultural marketing is planned to be undertaken.

An effective agricultural supply chain for perishable produce will also be established to cover at least 40% of agricultural produce by 2024 and 100% of agricultural produce by 2030, with primary collection and aggregation centers at farm gate and facilities of cleaning, grading and cold storage including cold chain facilities. Such centers will also to be linked to retail chains, processing units or main markets and hubs. The Assam Project on Agri-business for Rural Transformation (APART) assisted by World Bank will be implemented for this purpose.

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*Annual Report 2016-17 of Assam State Agricultural Marketing Board available at http://asamb. in/download/Annual-Report-2016-17.pdf

The increase in area of protected cultivation from current 708.74 hectares in 2017-18 to increase by about 30% by 2020 to 920.74 hectares. Under MOVCD and PKVY the total number of beneficiaries currently under organic farming in Assam stands at 11,913 of farmers for the year 2017-18 covering 9374 hectares. By 2030 the increase in the number of farmers practicing organic cultivation in the state to increase to at least 50,000 farmers covering around 40,000 hectares in Assam.

Area expansion under horticulture for flower, fruits and vegetables under the state plan and the centrally sponsored schemes to expand from current 6.1 lakh hectare in 2017-18 by further 30% area coverage by 2020 and 80% by 2030. Cultivation of Mushroom production increased through the Horticulture Mission for North East and Himalayan Region (HMNEH) from current 12,500 farmers to 37,500 farmers by 2020, including supply of spawns to farmers and engaging youth for income generation. Increase current farmer base of 135 farmers with 2250 bee-keeping boxes to 5250 by 2020 and 15000 by 2030.

(vi) Fulfilling non-cereal requirements (including meat, eggs, milk and fish)

Food security requires availability of other essential nutrients besides cereals. Proper nourishment will need fulfilling the requirement of proteins and other essential vitamins and minerals. The state has therefore adopted a target of meeting 100 percent of its projected requirements of meat, eggs and milk by 2030.

This will require milk production to increase more than three times the current level by 2030; meat by more than eight times; and eggs by about fourteen times. The per-capita consumption of fish is expected to triple by 2030. Productivity increases through introduction of better quality of livestock and fish, and improvements in rearing and fishing practices through inculcation of new technology and innovations in organization are planned. As in the case of agriculture, commercialization of livestock and fisheries will help increase farmers' and fishermen's incomes and act as a major anti-poverty measure.

(vi) Strengthening extension services. The Training and Visit (T&V) system will be further strengthened. A capacity building program and a plan for reorganizing, rationalizing and strengthening of the existing extension system including agricultural offices and functionaries will be adopted, after a thorough review of all schemes has been conducted, in June 2018. The same will be carried out by animal husbandry and veterinary and fisheries departments also.

(vii) Policy and institutional changes. Work ondeveloping acomprehensiveAgricultural Policy for the state covering land, water, seeds, pesticides, marketing, climate change, and all issues highlighted in the above sections has already been started in association with Assam Agricultural University. The process of amending the APMC Act, in order to resolve the issue of

collection of cess and tax by P&RD and Assam State Agricultural Marketing Board has also begun. Both these are targeted to be completed by March 2019.

C. Promoting rural development

Rapid development of the state will require greater opportunities for the rural population to move to more productive rural enterprises outside the agricultural sector. To promote this process, development of rural industries and rural infrastructure are planned.

(i) Sericulture and other rural industry. Sericulture is a major rural industry of Assam which currently engages around 6.5 lakh families and produces 2.7 thousand metric tonnes of silk yarn, principally of *eri* raw silk. Given its high domestic and international demand, sericulture is expected to provide a remunerative source of income growth for rural households in the state. Assam is among the top five states in India in production of silk yarn and has potential to improve its rank. Given the past rate of growth of sericulture industry, a target of 10 thousand metric tonnes by 2030 is achievable. This will, however, require continuous attention to improving productivity.

Handloom production provided employment to 19.5 lakh weavers in the state in 2015-16, although only 21% of these were full-time weavers. In terms of number of weavers, Assam accounted for half of all rural handloom weavers in the country and although regular estimates of production do not exist and need to be obtained. The 2009-10 National Handloom census indicates that the state accounted for a significant share of handloom production in India. Handloom weavers earned an average of 21% of their total household income from handloom production in the state.[5] The same census indicated that only about 2.5% of handloom weavers produced solely for commercial purposes while an additional 18% produced for both domestic use and commercial purposes. Converting more handloom weavers to commercial activities and helping them with better marketing facilities will help increase rural household incomes. By 2030, all weaving households should be supported to access commercial outlets for their produce.

The industry department of the state has also identified a number of other rural industries with high growth and employment potential. These include food processing, small tea growers, sugarcane industry, natural dye, candle making, waste management, organic vermicomposting, traditional crafts in areas of bell and brass metal, cane and bamboo, water hyacinth etc. Special efforts through training, marketing and financial support is envisaged.

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[5] *Third Handloom Census 2009-10. In 8 of the 19 items of handloom production surveyed in the census, Assam's share was more than 40%.*

(ii) Strengthening basic rural infrastructure. No rural development will be possible without development of basic rural infrastructure, particularly rural roads and rural electrification which play a major catalyzing role spurring development of rural areas. As against about 60% of households with access to electricity in 2016-17, the proportion of rural households actually using electricity was low (28% in 2013-14). The state plans to cover all households including rural which are those mostly deficient, by 2019-20.

In 2015-16, the state had 36,544 km of rural roads and 6000 km of panchayat roads. About half of these were gravel roads, however. The state plans to convert 31,923 km of these into single lane surfaced roads by 2023-24 and 43,000 km by 2029-30.

(iii) Strengthening Panchayati Raj Institutions (PRIs). Meaningful rural development will be impossible without effective local governance. In rural areas, the role of panchayats is critical and the state's development has been affected by their ineffective functioning so far. The following key measures are proposed:

a. *Promoting devolution.* The Eleventh Schedule under Article 243G of the Constitution endows PRIs with wide ranging powers for undertaking development in their local areas. The state government will gradually devolve responsibility for undertaking development on all of the 29 subjects listed in the Eleventh Schedule to the Panchayati Raj System. This process is targeted to be completed by 2030.

b. *Planning and coordination of development.* All Gaon Panchayats (GPs) will be encouraged to prepare their development plans for the listed subjects in a fully participatory manner. A three-tier coordination mechanism (state, district and block) to synergize all GP level local development activities of all concerned development departments will be established by 2023-24. Preparation of a single holistic GP Development Plan will ensure convergence of all the resources over which GP has command and integrating these different functions. This is also to ensure efficiency in budgeting, increased accountability in performance and better delivery of development.

c. *Fostering e-Governance*: The critical measures in this respect proposed are to provide last mile internet connectivity; institutionalize e-governance practices in the panchayats to facilitate the panchayat in decision making and provide full disclosure of information to citizens; expand direct benefit transfers for all the rural development programmes by 2023-24; introduce a real time monitoring system to monitor and report progress of all department's programs; GIS based mapping of assets created by different program; promoting cashless transactions by availing e-services, and e-commerce among the rural population; and providing necessary training on ICT to all panchayat members and staff.

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[6] *Third Handloom Census 2009-10. In 8 of the 19 items of handloom production surveyed in the census, Assam 's share was more than 40%.*

d.   *Strengthening internal revenue mobilization*: State Finance Commission Reports have observed that panchayats' own resource generation is very low and nominal compared to their powers. To improve matters, it is proposed to fill up posts of tax collectors many of which are lying vacant and introducing innovative measures such as by outsourcing tax collection to women SHGs. Currently, own revenues constitute only 11%1 of PRI's total revenues. This is targeted to increase to 15% by 2019; 20% by 2023-24 and 25% by 2030.

D.   Strengthening targeted anti-poverty measures

In addition to the above measures at promoting growth, including agricultural growth and rural development, the state proposes to strengthen targeted anti-poverty and hunger amelioration measures to ensure that poverty and hunger are eliminated. The main targeted programs are discussed below.

(i)   *Expand MGNREGA.* The MGNREGA scheme acts as a potent anti-poverty measure by directly providing employment at minimum wages to poor households; as well as indirectly by raising rural wages which helps a larger number of poor households who work as farm and non-farm rural laborers. The state plans to expand person-days of employment provided under MGNREGA from the 9.5 lakhs per annum to 40 lakhs by 2019-20 and maintain it at that level till 2030.

A number of problems associated with MGNREGA implementation identified with the program in general should be specifically addressed during this period. First, the benefits should be targeted more carefully towards poor households. Second, the quality of assets created should be improved.

(ii)   *Universalize and strengthen the Integrated Child Development Scheme (ICDS).* The ICDS scheme has been adopted at the national level to end under-nutrition amongst children and child hunger. At present, the incidence of underweight children below age 5 remains quite high at nearly 30% and Assam 2030 targets to reduce this to zero by 2030. Strengthening nutrition efforts through the ICDS program is a major instrument. It is proposed to expand coverage of the ICDS program from 94% of the targeted population in the state to 100% by 2019-20. A program to strengthen and upgrade 40% anganwadi centers which are deficient according to construction norms, providing clean LPG connections to all of them (compared to just 2% now), and ensuring compliance with age-specific feeding norms for all children in the state by 2030 is proposed.

(iii)   *Housing for All.* Shelter is a basic human need but much of the rural poor still live in inadequate and poor shelters. According to the 2011 Census, 12% of rural houses (numbering

6. 3 lakhs) are in a dilapidated state and not livable, which are mainly occupied by those in extreme poverty. The state has undertaken to provide housing for all within the SDG period through schemes such as the Pradhan Mantri Awas Yojana (PMAY) which provides cash assistance to eligible poor families who are to construct the houses with their own labor. The need for housing support is projected to decline from about 40% of eligible households currently, to 30% by 2019-20, 19.4% by 2023-24 and none by 2030 by which time all needs are likely to have been met.

(iv) *Livelihood generation.* Targeted livelihood support to develop entrepreneurship through provision of skills development and microfinance support through self-help groups (SHGs) for the poor is another important anti-poverty scheme. Supported by the National Rural Livelihood Mission (NRLM), the state plans to expand this scheme during the SDG period. Currently, about 90 thousand self-help groups (SHGs) have been brought under the NRLM scheme, while a total of 3.21 lakh SHGs are so targeted by 2019-20 and 4.18 lakhs covered by 2030. Training for up-gradation of different agri-horticultural trades under HMNEH, Mission Organic Value Chain Development (MOVCD), PKVY, PMKSY for employment generation will be expanded from current 5% rural educated youth to at least 15% of youth by 2020.

(v) *Protection all vulnerable persons, women and children.* Those who are vulnerable in the population (persons with disabilities; vulnerable women and children; the elderly and destitute) cannot participate in economic and educational opportunities because of their condition. All these persons fall into extreme poverty. The state will provide assistance to those who are capable and care for those incapacitated or unable to work.

1.   **Technological change and innovation.**

Achieving zero poverty and hunger by 2030 will require significant expansion of effort from all stakeholders and departures from "business as usual" approaches. Constant effort to employ new technologies and introduce innovative measures and practices to improve efficiencies manifold is essential. In each of the above interventions listed above, major scope to introduce technical change and innovation exists. The following is a small illustrative (and in no way exhaustive) list:

- In irrigation new technologies to conserve canal water (such as through canal lining) and expanding use of solar power to energize pumps

- In soil conservation scientific soil mapping and use of soil health cards (SHCs)

- In agricultural production use of more efficient mechanization, e-marketing information systems and development of cold chains

- In panchayats introducing e-governance systems to improve performance

· In implementing MNREGA improving efficiency in targeting and creation of durable rural assets

2.   Partnerships

Achieving zero poverty and hunger by 2030 cannot be realized without active partnerships. The foremost partnership essential in this area is with communities by strengthening panchayati raj institutions (PRIs) as discussed above. Effective private sector involvement has to ensured in marketing agricultural produce and developing cold chains. The involvement of academic community and research and development institutions in Assam and outside has also to be similarly ensured to see that a continuous process of technical change and innovation is institutionalized.

3.   Resource requirements

Attaining the vision of Assam 2030 requires "back-casting" the implications of the vision of the state in 2030 from targeted outcomes to required physical outputs, activities, and resources both human and financial to achieve them. This is the essence of this long-term strategic exercise.

(i)   *Financial resources.* The required expenditures based on the strategy developed to eliminate poverty and hunger. All departments show gaps in financial resources available. The total cumulative gap in the years 2017-19 for the Panchayat and Rural Development department, for example is Rs. 10,354 crores. Assuming efficiency improvements and use of technological and other innovations, about 30% of this gap could perhaps be reduced. The balance will have to be filled by (i) greater cost-sharing by communities and the PRIs; (ii) private sector participation; (iii) greater utilization of centrally sponsored schemes; (iv) seeking assistance from financial institutions such as NABARD; and (v) seeking assistance of ODA and other funds from external sources.

Appendix 9.1 of Chapter 9 summarizes the resource gap position.

(ii)   *Human resources.* The realization of Assam 2030 requires a very major scaling up of effort from current levels. Both the quantity as well as quality of services provided by the public sector must improve. There will be requirement of more staff to provide public services. Therefore, a detailed human resource strategy needs to be undertaken within each department focusing on (i) a thorough review of all positions as to their utility; (ii) filling up vacancies of those that are critical speedily; (iii) rationalization of existing personnel and redeployment if necessary; (iv) considering outsourcing if specialized private sector entities can provide services better; (v) working out a net requirement of additional critical staff. Such an exercise should be completed by 31 March 2018.

1. Coordination arrangements for Goals 1 and 2

Goals	Lead Departments	Supporting Departments		Cross Cutting Departments
Goal 1 **Poverty eradication**	Panchayat & Rural Development	Agriculture, Social Welfare, Industries (Small and Microenterprises)	AH &Veterinary, Dairy Development, Fishery, Sericulture, Handloom & Textile, PWD, Power	Social Welfare (Gender), WPT & BC, Tea Tribes Welfare, Minority Development, Char Areas, Hill Areas, Science & Technology, Information Technology, Information & Publicity. Transformation and Development Department; Finance (Oversight)
Goal 2 **Zero Hunger**	Agriculture	Irrigation, Health and FW, Panchayat and Rural Development, Food & Civil Supplies, Fishery, Animal Husbandry & Veterinary	Soil Conservation, Water Resources, Revenue & Disaster Management.	

Chapter 2 :
Health, well-being and access to basic health services
Goal 3: Good Health and Well-being for all in Assam by 2030
Goal 6: Access to Clean Water and Sanitation for all in Assam by 2030

Chapter 2: Health, well-being and access to basic health services

Goal 3: Good Health and Well-being for all in Assam by 2030
Goal 6: Access to Clean Water and Sanitation for all in Assam by 2030

This second chapter discusses the Sustainable Development Goals (SDGs) 3 and 6 as adopted by Assam.[7] SDG 3 focuses on ensuring healthy lives and promoting well-being for all and SDG 6 on ensuring availability and sustainable management of water and sanitation for all.[8] These related Goals are extremely critical for Assam, as they provide an integral foundation upon which to build a sustainably growing state economy based on a healthy and productive workforce. There will be a special focus on improving maternal and child health and necessary interventions to redress concerns of adverse water quality affected habitations, which need urgent attention in Assam. Good health outcomes depend crucially on availability of safe drinking water and improved sanitation also, in areas where Assam has critical gaps and challenges to be overcome. This chapter will therefore discuss the most critical health, water and sanitation related challenges in Assam.

1. Goals and targets.

In the health, water and sanitation sector, significant progress is being made; however, there are serious challenges in terms of expanding access to services, improving quality and efficiency of public service delivery, policy and institutional changes to facilitate service delivery, fostering technological innovation, community participation and ownership, organizational reforms, financial resources, human resources (doctors, nurses and paramedics and multidimensional sector experts) and infrastructure requirements.

There is a growing trend among people to go for treatment outside Assam, thus, out of pocket expenses for the general populace continue to be very high. The health status in Assam presents some alarming statistics in terms of the Maternal Mortality Ratio (MMR) which is the

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[7]*Assam 2030: Our Dream, Our Commitment. Vision and Strategic Architecture Document of the Government of Assam. Guwahati, 12 July 2016.*
[8] *For more information on the SDG Goals visit: https://sustainabledevelopment.un.org/sdgs*

highest in the country at 300 deaths per lakh live births (the national average is 167 deaths per lakh).[9] As per the SRS 2015, the state also has the highest under-5 mortality rate in the country at 62 per thousand live births. Furthermore, Assam also has one of the lowest immunization rates in the country with only 47% of children fully immunized as per the National Family Health Survey 4 (NFHS 4) of 2015-16. Moreover, Assam has several pockets of high health deprivation which include the riverine char areas, tea belts and hilly areas which need special attention. The number of cases related to cancer and other non-communicable diseases are also extremely high and rising in the state. Regarding water and sanitation, as on 31st March 2016, coverage of rural household with sanitary toilet facilities was 52 % and water coverage through Piped Water Supply System (PWSS) in 2016 for rural population was 46%.[10] This low level of coverage poses critical health challenges especially for child and maternal health. Infectious diseases through unhygienic conditions and unclean water poses one of the biggest threats to child mortality. The major indicators that will need to be closely monitored with respect to Goals 3 and 6 are set out with baselines, 2030 targets and intermediate targets in Table 2.1 below.

Table 2.1: Major indicators and targets on health, water and sanitation

Indicators	Baseline 2016-17	Target 2019-20	Target 2023-24	Target 2030-31
Maternal Mortality Ratio (00 per lakh)	300 (2011-13)	203	155	70
Under 5 Mortality Ratio (00 per 1000)	62 (2015, SRS)	55	44	25
Proportion of births attended by skilled health personnel (%)	74.3% (NFHS-4, 2015-16)	81.14	87.9	100
Proportion of Institutional deliveries (%)	70.6 (NFHS-4, 2015-16)	78.4	86.2	100
Infant Mortality Ratio (per 1000 live births)	44 (2016, SRS)	41	33	19
Neonatal Mortality Rate (per 1000 live births)	25 (2015, SRS)	22	18	10
Immunization (%)	47.1 (NFHS-4, 2015-16)	85	92	100
Full Ante-Natal Coverage (%)	18.1% (NFHS-4, 2015-16)	39.9	61.7	100
Women aged 15-19 years who were already mothers or pregnant at the time of survey (%)	13.6 (NFHS-4, 2015-16)	10	6.4	0
Average out of pocket expenditure per delivery (Rupees)	3210(2015-16)	2354	1498	0
100 days consumption of iron and folic acid by pregnant women (%)	32 (2015-16)	50	68	100

[9] SRS 2011-13
[10] SPAP provided by PHE Department.

Table 2.1: Major indicators and targets on health, water and sanitation

Indicators	Baseline 2016-17	Target 2019-20	Target 2023-24	Target 2030-31
Anemic pregnant women (%)	45 (2015-16)	30.6	16.2	0
Functional 24*7 PHC's out of 1014	563	676	800	1014
Sub Centers out of 4621 equipped for handling deliveries	696	1201	1709	2310
Functional hospitals out of 758 surveyed tea gardens	428	538	652	758
Hepatitis B service coverage rate (Child aged 12-23 months received three doses of Hepatitis B vaccine) (%)	52 (NFHS-4)	90	90	90
Malaria incidence rate (%)	0.23 (2016)	<1	<1	Elimination of Malaria
Dengue incidence (no. of cases)	6157 (2016)	3079	1540	770
Japanese encephalitis incidence (no. of cases)	427 (2016)	214	107	54
Cardiovascular disease among 30-70 years early detection rate (%)		20.0	50.0	75.0
Hypertension and diabetes disease among 30-70 years, screening coverage rate (%)	53.0	70.0	90.0	100.0
Blindness prevalence rate (%)	0.5	0.3	0.1	0.1
Cancer among 30-70 years screening coverage rate (%)	10.0	25.0	50.0	100.0
Prevalence rate of any type of tobacco use among 15-49 years (%)	Men – 63.9 Women – 19.7 (NFHS-4, 2015-16)	Men-55 Women- 15	Men- 45 Women- 10	Men- <20 Women-<5
Prevalence rate of heavy drinking among 15+ years (%)	Men – 35.6 Women – 6.9 (NFHS-4, 2015-16) (% of population consume alcohol)	Men-34 Women-6.5	Men-30 Women-5.5	Men-<15 Women-<5
Home connection for drinking water supply (%)	1.9	70.0	80.0	100.0
Water quality affected habitation to be addressed (%)	10 (2016)	2.5	0	
Proportion of Household Covered with sanitary toilet (%)	52 (2016)	100		

Table 2.1: Major indicators and targets on health, water and sanitation

Indicators	Baseline 2016-17	Target 2019-20	Target 2023-24	Target 2030-31
Children with fever or symptoms of ARI in the last 2 weeks preceding the survey taken to a health facility (%)	46.8 (NFHS-4, 2015-16)	60	80	100
Children with diarrhea in last two weeks receiving ORS (%)	51.9 (NFHS-4, 2015-16)	80	100	100
Children aged 12- 23 months receiving 3 doses of DPT/Pentavalent (%)	66.5 (2015-16)	90	95	100
Road traffic incidents (no.)	6959 (2015) (National Crime Records Bureau)	6401	5658	5101
Birth Registration Coverage (%)	92.86	95	98	100
Death Registration Coverage (%)	60	75	85	100

Source: Departments' Strategy Papers and Action Plans (SPAPs)

2. Major strategic interventions proposed

A. Strengthening health systems and promoting access to services

Existing health systems have been unable to cater to the needs and the scale of services required. As per WHO the six building blocks for health system strengthening are: development of good health services, a well-performing work force, a well-functioning health information system, essential medical products, vaccines and technologies and a good health financing system, and most importantly good leadership and governance."Health infrastructure facilities in the state are currently not adequate, better procurement and distribution systems need to be created, adequate health workers with the right skills and motivation need to be engaged, and a financing system which covers the most marginalized is essential.

I. **Developing health infrastructure and systems:** It is important to develop health systems as per Indian Public Health Standards (IPHS) norms. The current number of delivery points in the state will be increased (refer to Table 2.2). The number of comprehensive referral centers to be equipped with tele-radiology and tele-medicine and other app-based technologies including in geographically remote areas with a focus on accessibility will be increased from 8

" *Everybody's Business, Strengthening Health Systems to improve Health Outcomes (WHO Framework for Action)* 2007 http://www.who.int/healthsystems/strategy/everybodys_business.pdf?ua=1

in 2016 to **145** by 2023 and **200** by 2030. Finally, developing and finalizing Essential Health (Services) Package (EHP) for all levels of care is required and will be provided by 2030.The range of benefits in the system which are provided through programmes, interventions, goods and services will be broadened to encapsulate the most critical areas and methodologies developed for handling these.

Strengthening Primary and Secondary Health Care systems : Gaps in terms of access to services can only be fulfilled by expanding the number of health-centers across the state. Primary care systems depend on a network of primary health facilities, supported with adequate and skilled human resources, logistics support system and a referral back up. The state requires around 6817 Sub-Centers(SCs) by 2019-20 and 1112 Primary Health Centers (PHCs) by 2019-20. Similarly, in the secondary health care segment too, there is a dearth of efficient facilities which need to be expanded (Refer to Table 2.2). The state government will equip the District Hospitals and Community Health Centers(CHCs) to expand services and have better facilities. There is also a need to set up more multi-specialty hospitals with around the clock services in every subdivision which will be addressed on priority. Similarly, steps will be taken to increase the bed strength in every district hospital. Furthermore, all public health care facilities will have periodic quality checks through the involvement of third parties to retain the desired quality standards.

Table2.2: Present status, gaps and requirements on Health Institutions in Assam

Category of Health Institution	Present Status + Under Construction (2016)	To fill up gap as per present requirement (2019-20)	Required (2023-24)	Required (2030-31)
Sub-centre	4621+626	6817	8339	9236
Sub-centre functional as health wellness centers	123	6817	8339	9236
Primary Health Centre	1014+81	1112	1362	1510
Community Health Centre/ Model Hospital	151+76	278	341	377
Sub-divisional Civil Hospital	14	54	54	54
District Hospital	25+2	34	34	34
Medical College	6	9	12	27

i. **Human resources for health :** There is a need to substantially increase trained human resources in the health sector and engage more health practitioners. This will be addressed on priority (refer to Table 2.3). This needs to be coupled with a robust health management team based on performance based management systems utilizing modern HR and medical information technology. Providing all essential and supportive services will be prioritized such as specialist doctors, nurses, other support staff, infrastructure, equipment, obstetric HDU, CSSSD, BB/BSU, mechanized laundry, lab services, drugs and diagnostics etc. Management information system (MIS) for human resources in the health sector will be developed by **February 2018** to be able to guide and build capacities of health functionaries. As per IPHS norms, the total current requirement of allopathic doctors is around 7000 but currently there are about 3200 doctors. To close these gaps in a phased manner certain essential steps are:

- Create a proper data base of all categories of doctors, nurses and para medics, and deploy them in a rational manner, depending on disciplines and skill sets.

- Strengthen existing medical colleges and establish more medical colleges from the current 6 to 27 by 2030 (Table 2.3) to increase the number of doctors in the state.

- Create a cadre of specialist doctors with suitable pay scales, including openings for lateral entries, to attract and retain talent.

- Establish institutes to train nurses, technicians and paramedical staff in every district. Strengthen nursing governance systems to improve regulation, and quality of nursing education and management.

- Ensure full coverage of rural health services by (i) providing pay, benefits and other incentives to encourage qualified doctors to provide rural services; and (ii) by filling gaps in services through auxiliary staff such as licensed medical practitioners (LMPs). A policy for this purpose to be prepared by June 2018.

- Expand allied technical skills – radiographers, laboratory technicians, physiotherapists, pharmacists, optometrists, etc. Make provision for multi skilling with different skill sets so that the services of these paramedics, when posted in peripheral hospitals, are more efficiently utilized.

- Establishing a fast track system for recruiting health professionals (such as by setting up a Medical Services Recruitment Board) by March 2018 as APSC processes can take an unduly long time.

Table 2.3: Present Status of Human Resource, Gaps and Requirements for Assam

Post	Present Status (Regular + NHM) (2016)	Required (2019-20)	Required (2023-24)	Required (2030-31)
Allopathic Doctor including Specialist	3,188	7,132	8,262	8,918
Ayurveda, Yoga & Naturopathy, Unani, Siddha & Homoeopathy (AYUSH) Doctors	762	1,478	1,791	1,975
Dental Surgeon	168	366	429	465
Staff Nurse	4257	10,148	11,528	12,332
Lady Health Visitor (LHV)	398	937	1179	1255
Auxiliary Nurse Midwife (ANM)	10,294	14,746	18,040	19,982
Multi-purpose Worker (Male)	3000	6817	8339	9236
Accredited Social Health Activist (ASHA)	31955	35820	38400	43412
Lab Tech	1,451	2,190	2,566	2,786
Pharmacist	1,520	1,756	2,069	2,253
Radiographer	145	434	497	533

Source:Health and Family Welfare Department SPAP

I. **Medicines and consumables :** A consolidated essential drugs list (EDL) is important to procure and ensure supplies of medicines and other items in an efficient, cost effective and transparent manner. A dedicated agency for this purpose was launched under the Companies Act, 2013 on 22nd June 2016, called Assam Medical Services Corporation Ltd., on the patterns of many other states. This agency has been set up with the primary objective of ensuring ready availability of Essential Drugs and consumables in the Government health-care Institutions throughout Assam, by adopting a streamlined procedure for bulk procurement, storage and distribution of Essential Drugs and consumables, thereby reducing expenditure from the state exchequer. The state has already instituted a real-time inventory management system for vaccines and logistics through *electronic vaccine intelligence network (e-Vin)* which will be expanded for other drug/equipment/consumables inventory management system.

A. **Water Sanitation and Hygiene (WASH) for All**

The strategy for WASH in Assam envisages that concerned efforts from all stakeholders with necessary convergent approaches will facilitate achievement of SDG-6, focusing on safe drinking water and safe rural sanitation practices for all. These initiatives will be implemented adopting an inclusive approach "leaving no-one behind" on catchment area saturation basis, to ensure healthy life and wellbeing of every individual by provision of safe, adequate, affordable

water supply for drinking,cooking and other domestic needs on a sustainable basis and in all situations for both households and institutions; as well as rural sanitation facilities sustainably for all promoting cleanliness, hygiene and eliminating open defecation, with community ownership. Details of these two main interventions are provided below.

i.   **Safe Potable water for all** : Given that only 1.9% of the population has water with a home connection, there is significant work to do in this regard. Challenges in terms of water contamination, high levels of arsenic in water and other contaminations need to be mapped to understand the state of water tables in these areas.   Low-cost solutions and innovative community owned business models will be developed based on success in other parts of the country applicable to the context in Assam. Optimum use of rainwater will also be an integral element in achieving universal coverage. A reform initiative is being fostered by the PHED, Assam, to encourage community (users) for active participation in the Operation & Management (O&M) of rural Piped Water Supply Schemes (PWSS). Accordingly, Water Users Committees will be formed for each rural PWSS to ensure effective O&M of the PWSS, creating social responsibilities in the form of ownership, regular supply of water in liaison with PHED. Such an endeavor has successfully shifted the ownership of the rural PWSS to the community (users/ beneficiaries) to ensure the smooth functioning of the PWSS, with people's participation. Recently efforts have been initiated to involve Gram Panchayats more in the maintenance of the PWSSs. In future the PWSSs will be maintained in collaboration with Gram Panchayats with Water User's Committees designated as sub–committees of Gram Panchayats.

ii.   **Sanitation for all** : As India as a nation moves towards being open defecation free, Assam still has a significant way to go to achieve this goal with only 52% of the rural population having access to sanitary toilets. Providing low-cost toilets through Swachh Bharat Mission (Gramin) coupled with adequate education and informational training is important to ensure that the toilets are used and monitoring should not only entail number of toilets built, but usage of them demonstrating the behavioral change. To improve the delivery of rural sanitation services a decentralized delivery mechanism shall be put in place with institution building at the village level (Village Water and Rural Sanitation Committee in each village). A monitoring mechanism is also put in place to coordinate and manage their activities. This has been envisioned as a process of community empowerment. Focused capacity building of people at village level on low cost rural sanitation technologies including solid and liquid waste management has been prioritized. Special initiatives have also been initiated to reach out to the marginalized community or groups and hard to reach areas (char areas, tea garden community, hill areas).

C.   **Specific health interventions critical for Assam**

Several critical areas that need priority interventions have been identified in the state.

These include maternal and child health; specific communicable diseases; emerging non-communicable diseases; preventive health care, alternative forms of medicine; provision of clean water and improved sanitation to the entire population; and other critical areas such as mental health, preventing substance abuse and road accidents. These critical areas are discussed below in turn. However, to address all current and emerging concerns effectively, **an intervention mapping exercise** is important and will be simultaneously conducted through a suitable research institute identified for this purpose (within June 2018). This exercise will undertake a strategic mapping of region based problems and identify interventions required.

(i)   **Reducing MMR, IMR and under 5 mortalities:** For reducing maternal, neonatal and infant mortality the minimum intervention package should comprise quality antenatal care, skilled birth attendance and postnatal care including early initiation of breast feeding. Improving quality postnatal home visits for postnatal mothers and newborns for home deliveries, for those delivered at health facility, newborns discharged from SNCUs and low birth weight babies are also important. Integrated Action Plan for Prevention and Control of Pneumonia and Diarrhea (IAPPD) plan which was introduced in 2014 will be strengthened in the state to prevent under 5 deaths from Pneumonia and Diarrhea (and Malaria in endemic districts). Reducing MMR and IMR is also dependent on strengthening vertical programmes on family planning and contraception. Current programmes need to be strengthened and more awareness needs to be built by teaching young people and expecting parents on awareness of sexual and reproductive health and rights (SRHR) and maternal and child health. Ensuring access to basic services through proper history taking, palpation, blood pressure, fetal heart screening, risk factor screening, and referrals when necessary should be an integral to this process.

To achieve better immunization coverage and quality, the state will work on strengthening of microplanning, reaching the unreached, effective tracking of beneficiaries and capacity building of frontline workers and supervisors.

The existing Maternal and Child Health schemes need to be revisited to understand the gaps and suggest better implementation strategies, including microplanning for full immunization coverage. A state Action Plan for reducing MMR and IMR should be drafted by March 2018 for achieving targets in this area by 2030.

(ii)   **Prevention and Control of communicable diseases:** Strategies would incorporate strengthening of the disease surveillance system including early warning systems, as part of International Health Regulations (IHR). The health system would also be strengthened to ensure increased and timely detection along with effective management of communicable diseases with special focus on diseases of public health importance like tuberculosis, HIV/AIDS, vector-borne diseases, and viral hepatitis. Active and passive screening approaches would be deployed to improve detection rates.

Other communicable diseases such as dengue, chikungunya, H1N1 and swine flu, Japanese encephalitis and preventative measures for diseases such as Zika needs to be monitored. In children, measures towards reducing diarrheal diseases which could lead to morbidity and mortality in the under 5 age group needs to be strengthened.

Campaigns towards getting vaccinated against such communicable diseases is critical. Furthermore, ensuring clean environment, clearing water logged areas, using protection against mosquito bites, and ensuring safe drinking water facilities and sanitation are important.

The state will have a robust plan for prevention and control of all communicable diseases of concern in the state by March 2018.

(iii) **Prevention and Control of non-communicable diseases (NCDs):** The World Health Organization (WHO) states that NCDs such as hypertension, diabetes, cardio-vascular diseases (CVDs) and cancers share four behavioural *risk factors*- unhealthy diet, lack of physical activity, and use of tobacco and alcohol. The use of tobacco is a major problem in Assam which will be dealt with awareness on tobacco and its inter-related products. One in every four Indians (according to WHO) risk dying of an NCD related disease before the age of 70. According to the Indian Council of Medical Research (ICMR), under its National Cancer Registry Programme (NCRP) 2012-14, the Kamrup (Metro) district has the fourth highest cancer incidence rate among men in the country with 206 affected in a population of 1,00,000; and the cancer rate among women in the district was third highest in the country. The district has also recorded the highest cases of gall bladder cancer in both men and women in the country. Assam ranks third in the number of cases of oesophageal cancer in women.[12] Blindness is also a growing concern in the state.

A framework similar to 'India's National Monitoring Framework for Prevention and Control of NCDs' will be developed for the state. The 'Assam State Monitoring Framework for Prevention and Control of NCDs' will be developed by June 2018.This framework will include life style modification, physical activity including Yoga, awareness of healthy diet, ill effects of drinking alcohol, and stopping smoking and other tobacco usage. The framework will develop counselling and awareness building mechanisms through medical centres, AYUSH and all other mechanisms. Health information on how to lead healthier lives should be given to everyone through large scale awareness campaigns and to all visiting doctors. The student body will be educated through inclusion of wellness knowledge and more focus on physical education.

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[12] *National Centre for Disease Informatics and Research. National Cancer Registry Programme, Population Based Cancer Registries 2012-14. Indian Council for Medical Research, access: http://ncrpindia.org/ALL_NCRP_REPORTS/ PBCR_REPORT_2012_2014/ALL_CONTENT/Printed_Version.htm*

(vi) Promoting preventive health care through holistic health and well-being approach: A holistic means of healthcare also needs to be strengthened by promoting practices such as Yoga, meditation and Ayurveda through the Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy (AYUSH). To promote yoga, 100 yoga centers will be set-up in Assam by 2018 in selected blocks of the state in phase I, with a gradual increase in numbers in succeeding phases. The International Day of Yoga should also be celebrated on 21st June each year to promote yoga and individual well-being.

As part of this process alternative forms of medicine will be further developed in the state. Ayurvedic hospitals and colleges will be setup across Assam in Majuli, Raha and Dudhnoi. The gaps in terms of doctors and facilities (refer to Tables 2.2and 2.3) will be filled partly by these alternative practitioners to provide health services to all.

(v) Expanding coverage of water and sanitation services to all: Fulfillment of all SDG 3 targets in health is only possible through fulfilling SDG 6 targets as well relating to universal water coverage and safe sanitation practices for the entire population and particularly rural areas where large deficiencies exist. Monitoring and evaluation of existing programmes be conducted by June 2018 to bridge critical gaps in service delivery. Critical gaps exist in technical, institutional and organizational areas to bring the large population particularly from rural area, facilitating universal coverage in best possible manner, through incorporation of best practices from other Indian states. Enabling environments and capacity will also be created for Panchayat Raj Institutions / Local communities to manage rural drinking water sources and water and sanitation systems. For this purpose, extensive awareness on benefits of WASH is being initiated to disseminate importance on WASH practices. There is also a special problem in Assam with regard to availability of clean water and improved sanitation facilities during natural disasters particularly floods. The Government will therefore always remain proactive, while taking account of all special needs of importance, such as ensuring safe water facilities and water use and handling practices during disasters such as floods, ethnic violence, earthquakes etc. and for inmates in the relief camps.

(vi) Addressing other critical health challenges (mental health, substance abuse and road accidents): Strengthening quality implementation of Rashtriya Kishor Swasthya Karyakram (RKSK) programme across the state would be instrumental in addressing issues of mental health, substance abuse and preventing road accidents. Community level awareness would also be developed through a peer educator programme. Health and Wellness centers would also act as platforms for dissemination of these messages. More trauma care centers would be established in priority areas for effective management and rehabilitation of accident cases.

C. **Addressing health deprivations through targeted support for deprived areas and groups**

An important health sector issue in Assam is the existence of several geographical pockets of population and socio-economic groups that face significant health deprivations compared to the general population. Special measures therefore need to be taken to provide targeted support to such pockets and groups. Some of the more critical targeted intervention that will be carried out are discussed below.

(i)   **Tea Garden community**: The Government has recently launched 80 medical mobile units exclusively for tea garden communities. The Government has also engaged with 150 tea garden hospitals in PPP mode for improved service delivery to these areas. It is also disbursing compensation of wages for temporary workers. But health among tea garden communities remains a challenge in the state. Government will enter into productive partnerships with the tea garden managements and other stakeholders to ensure availability of essential health services for the tea garden communities including health, nutrition, housing, safe water, sanitation and health education.

(ii)   **Char areas**: Though the state is utilizing 15 boat clinics and 5 boat ambulances in 13 districts of the state to provide health care services in char areas, these investments are insufficient to cater to all people residing on these riverine islands. Primary health care services in these areas are not assured because of insufficient health infrastructure, lack of electricity, poor road infrastructure, continuous migration of communities, lack of water and sanitation facilities, religious taboos, lack of education facilities, prevalence of child marriages, etc. All these interventions which involve many outside the health sector will need to be closely coordinated to achieve full access to quality health services by people of the char areas.

(iii)   **Hill, border and forest areas.** Similarly, access to health care is also compromised in hill areas, border areas and forest areas.

A comprehensive health strategy will be developed (with the assistance of the State Level Committee) for targeted attention to all these groups and areas mentioned in (i) to (iii) above. A state level task force would be constituted by December 2017 to develop these strategies.

D.   **Reducing Out of Pocket Expenses**

Illnesses, be long term chronic or sudden and acute, can impose costs on households that can cascade into catastrophic healthcare expenses with wide ranging consequences. It is estimated that about 70% of all healthcare spending in India is drawn from personal, or out of pocket expenses of households and that onset of catastrophic illnesses among the near poor

cause nearly 6.2% of total households in India to revert to poverty. The Government's main measures to reduce this burden on the poor are discussed below.

i.   **Health Assurance Scheme:** Government of Assam launched a pioneering State Health Assurance Scheme **"Atal Amrit Abhiyan"** on 25th December 2016. The objective of this new scheme is to improve access of below poverty line and above poverty line (up to an annual family income of Rs 5 lakhs) to quality tertiary medical care for identified six specialties i.e., *(i) Cardiovascular diseases, (ii) Cancer (iii) Kidney diseases, (iv) Neo natal diseases, (v) Neurological conditions, and (vi) Burns;* requiring hospitalization for surgeries and therapies through an empaneled network of hospitals both inside and outside the state. Financial benefits are assured up to Rs 2 Lakhs per individual of the covered family annually towards approved procedures and other services on a complete cashless basis under the scheme. The first phase of this health assurance scheme will roll-out from September 2017. The entire state needs to be covered under this plan in a phased manner by end of 2018.

ii.   **Free diagnostics services:** The Government intends to provide universal access to a progressively wide array of free drugs and diagnostics. Many initiatives are in the offing in this regard. A free Essential Diagnostics Service Initiative was launched in 2017 to ensure availability of free basic diagnostic tests, appropriate to the level of care, in public health facilities. This will reduce out of pocket expenditures, ensure continuity in treatment, help in screening of chronic conditions and improve quality of health care and patient experience. Broadly, three categories of services will be provided free of cost to all beneficiaries under this initiative viz:

-    Lab Facility at all PHC/CHC/SDCH/DH.

-    Radiology Services (X-Ray) at all PHC/CHC/SDCH/DH and

-    Computed Tomography (CT) Scan in 25 District Hospitals

This will also be rolled out in a phased manner to ensure full coverage in the state.

iii.   **Expenditure on drugs/medicines:** Studies[13] have shown that the highest head under out-of-pocket expenditure is usually on drugs, especially among the poor. A policy will be finalized on rationalizing high drug expenditure and creating solutions towards providing access to these drugs/medicines for the poor by June 2018.

E.   **Institutional Reforms**

i. **Organizational restructuring:** The State level governance structure and mechanisms for effective health services delivery needs restructuring. **A State Level Committee** (to be formed by 1st March 2018) would be constituted to deliberate and propose the framework, structure and mechanisms for this purpose. The State Level Committee will be headed by the Principal

Secretary, who will critically analyze and review the health programmes regularly to ensure progress, optimal utilization of resources and to ensure accountability.[14] Organizational restructuring and policy changes will also have to look at various aspects such as:

(a) Policy for promoting education and training to Post-Graduate Diploma courses in different disciplines to enable MBBS doctors to do specialized treatments on the pattern of Maharashtra

(b) Policies to encourage and regulate private sector in health

(c) Policies to reduce traffic accidents

(d) Patient feedback systems for quality assurance

(e) Prescription of generics

(f) Better coordination arrangements between medical education and otherbranches of health

(g) Quality and training of staff

(h) Better HR coordination and curbing absenteeism

(i) Pay and other incentives for encouraging doctors and medical staff in rural areas

(j) Review of all existing schemes: State Committee will start the process of reviewing all existing schemes (including supported by the departments responsible for water and sanitation all schemes in the WATSAN areas) to check the feasibility and coverage of all schemes and ensuring all diseases are covered. Overlapping programmes and policies will be streamlined and monitoring mechanisms of all schemes will be reviewed for the most effective implementation of all schemes at the state level.

Similarly, in the water and sanitation sector, organizational reforms will be initiated too based on the overall WASH strategy to achieve the SDG targets focusing on:

(a) Introducing better monitoring and coordination especially with the formation of new Districts and Civil Sub-Divisions.

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[13]Reducing out-of-pocket expenditures to reduce poverty: a disaggregated analysis at rural-urban and state level in India. Charu C Garg Anup K KaranHealth Policy and Planning, Volume 24, Issue 2, 1 March 2009, Pages 116–128,https://doi.org/10.1093/heapol/czn046Published:17 December 2008

[14] The State Level Committee will have members from Secretary Healthcare, Secretary Medical Services, MD NHM, Director Health Services and Family Welfare, Director AYUSH, PD Assam State AIDS Control Society, Commisioner of Food Safety and Drug Administration, Centre for SDGs, UNDP representatives (e-vin), and UNICEF representatives.

providers and administrative supervisors and the department and directorates. Institutes of training including medical colleges will be upgraded to ensure they have latest knowledge and technologies and regular inspections will be conducted at least annually. The State Committee will set up guidelines for this.

d. **Monitoring and Evaluation:** Programme monitoring, data evaluation, behavioral and biological trends evaluation are critical for achieving 'good health and well-being for all'. The Health Department will have a Monitoring and Evaluation (M&E) cell and similar cells at appropriate supervisory levels. The M&E mechanism will be integrated for both health and water and sanitation and involve other departments (see below) also contributing to health outcomes. Regular checks and upgradations should be done for ensuring the proper implementation of all schemes and policies at all levels of functioning. Data should be available real-time based on inputs made at regular basis. GIS mapping should be interlinked to the M&E systems for further improving quality and service delivery.

C.   Convergence with other sectors needed for health, clean water and sanitation

Health outcomes depend on a host of social, economic and cultural factors which extend beyond the direct remit of the health department. Factors such as early marriages, adolescent pregnancies, nutritional status, awareness about good health and wellbeing practices, access to safe water and improved sanitation etc., which contribute critically towards health outcomes require a multi-sectoral approach to handle.

Likewise, clean water and sanitation (SDG-6), being at the core of sustainable development, cutting across sectors and regions, necessitates inter-linkages with other SDG goals and targets. The success of SDG-6 also enables the achievement of a number of other targets across the SDGs. It is therefore necessary to adopt a synergized approach involving all concerned stakeholders.

The Government will therefore establish an efficient coordinating mechanism by 1st March 2018 to ensure effective inter-departmental coordination to achieve health and clean water and sanitation for all.

The following multi-sectoral issues require attention to build inter-sectoral coordination and synergies:

i.   **Improving Nutritional Status:** Convergence will be built with ICDS to improve adolescent, maternal and child nutrition and promoting early and exclusive breast feeding. The state will strengthen quality of Village Health Nutrition Days (VHNDs),Village Health Sanitation and Nutrition Committee (VHSNCs) and Village Health Education sessions through supportive supervision, capacity building of frontline workers and joint reviews.

ii.   **Addressing social evils:** The health department will work in coordination with ICDS, ICPS, PRIs, peer educators under RKSK, NGOS and other stakeholders etc. to address issues of child marriage, adolescent pregnancies, demand generation for use of healthcare facilities, promoting healthy behaviours, addressing harmful social norms and traditional practices.

iii.   **Health, education and awareness:** The health department will work in coordination with the Education department to improve literacy and awareness to health and wellbeing practices with an emphasis on education of girls. It will work with Panchayati Raj Institutions (PRIs) for better utilization of PRI platforms i.e. Gram Sabha's and the urban local bodies to improve health awareness among communities, better utilization of health services by communities and community level monitoring of health services. Awareness among children would be targeted through inclusion of health messages in school curriculum, school assemblies and rallies.

iv.   **Water and Sanitation:** Health and Public Health Engineering Departments will work closely with all concerned departments and stakeholders to provide access and introduce safe practices with regard to clean water and improved sanitation which are essential for good health.

v.   **Pollution and Health:** The health authorities will work in collaboration with State Pollution Control Board to reduce pollution and proper disposal of bio-medical waste.

vi.   **Disaster reduction:** Working in convergence with State Disaster Risk Committee to build resilient health services and incorporating risk mitigation in view of risk of civil unrest/ strife, drought, floods, climate change and other natural and manmade disasters.

vii.   **Road Accidents:** Preventing road accidents require close cooperation between health, PWD, Transport, Municipal and Home departments to ensure safe roads, sufficient lighting on roads, compliance of traffic rules, immediate recovery and removal of accident victims etc. The health department will gear up ambulatory and hospital facilities for quick referral and treatment of trauma cases.

3.   **Technological change and innovation**

Technological Development will shape the future of healthcare. It will also assist in reducing the soaring healthcare costs by providing low-cost solutions to health-related issues. Rapid advances are taking place around the world in this area which the state will strive to adapt and utilize for its use. The following areas have particularly strong potential for technological innovations and will be prioritized:

i)   **Patient Data and records:** A centralized system for maintaining records of all patients

in the state will be created. This will assist in dealing with cases faster and more scientifically. This would also be done in a phased manner preferably in conjunction with the Atal Amrit Abhiyan (AAA) programme.

ii) **Health Information Management (HIM):** HIM systems will be created which acquires health reports and analyses these, while protecting information of patients provides them quality care and services. Patient survey methodologies should be introduced to get information from patients on the quality of service and facilities. These should be recorded automatically and analysed for strengthening the health- systems of the state.

iii) **ICT for Strengthening Human Resource:** Use will be made of Information and Communication Technology (ICT) in strengthening health systems, performance management of facilities and HR. Robust system will be created which monitor the gaps in the services being provided especially in terms of Human Resources. Training facilities will be strengthened through IT based platforms.

iv) **Technology for improving service delivery:** Efforts to introduce technological innovations for monitoring all health services will be made to improve efficiencies of service delivery.

v) **Technology for Water and Sanitation:** The use of technological innovations for monitoring is essential to ensure service delivery more efficiently. For this, use of IT based platforms will be useful and their adoption will be pursued. In the water sector, change management and use of new technology will be crucial to ensure uninterrupted water supply and eliminating "non-revenue water" due to leakage, mechanical breakdown, wear and tear etc. Enhanced energy efficiency and sustainability can be promoted through use of advanced technology such as SCADA etc. Suitable technological options like water retention reservoir etc. may also be adopted to take care of source sustainability in the event of climate change or any other location specific constraints. Further, for rural sanitation services more community friendly and convenient technology options for sanitary toilets as well as waste management shall be adopted for ensuring Total Environmental Rural Sanitation (TES).

vi) **Telemedicine:** Using telecommunication and information technology to provide clinical health care from a distance will be initiated. Remote locations without medical services in distant rural communities will be covered through this method.

vii) **Mobile Health Clinics:** Currently 80 MMU, 15 boat clinics and 5 boat ambulances are already in place in the most marginalised areas of Assam. There are already partnerships in the state to engage other stakeholders to ensure health for all. These Medical Clinics provide a convergence of services for identification, screening, diagnosis, monitoring and treatment, follow

up and referral of high risk cases. Technological advancements will be explored to scale up treatments through these units to more people across the state.

4. Partnerships for Health for All including Clean Water and Sanitation

Providing Health for All by 2030 is a challenge before the state which cannot be achieved without active partnerships of all stakeholders who can contribute to this Goal. The state will make efforts to secure active support and cooperation from the following partners:

i) **Development partners:** This would be key in technical and operational guidance to health programmes in line with national and global framework. The development partners would also do independent field level monitoring and evaluation of health programmes and schemes to bridge the programmatic gaps. Currently multiple programmes are being run with partnership with NGOs and other international organisations such as UNICEF, WHO and UNDP among many other organisations. These collaborations and partnerships should be encouraged based on the ability of these collaborations being able to cater to critical gaps. Based on the *Intervention Mapping* developed by the state, partnerships could be created to assist the government in filling definite roles in ensuring 'good health and well-being for all.'

ii) **Research and development partners:** An environment for engaging partners in research will be created as healthcare research is a primary cornerstone for development of health indicators in the state. Partnerships with private sector utilising their Corporate Social Responsibility (CSR) obligations at the minimum; with academic institutions; and professional associations will be secured. Public health related research to address state specific problems will be commissioned through medical colleges, ICMR institutes and other nationally & internationally recognized institutes/organizations etc. A target of commissioning at least five major research projects annually should be targeted by the State Level Committee.

iii) **Private Sector Engagement:** Public-Private Partnerships (PPPs)will be developed for health system strengthening, piloting of innovations, independent evaluation, strategic purchasing of services, knowledge generation, research, capacity building etc. Possibilities of outsourcing services, developing PPPs for health services provision, roping in central government hospitals, mission hospitals and other existing private partners will be actively explored. MoU's with such partners will be entered with specific monitorable outcome indicators and payments linked with performance.

iv) **WASH Partnerships.** Critical gaps including capacity and support in technical, institutional and organizational areas to cater to the need of safe water and improved sanitation for a large population will be filled by developing active collaborations with different stakeholders and development partners and technical agencies such as IIT Guwahati, Engineering Colleges,

TISS, Universities, UNICEF, World Bank etc. Enabling environments and capacity will also be created for Panchayat Raj Institutions and Local communities to manage rural drinking water resources and water and sanitation systems.

5. **Resource requirements:**

Attaining the vision of Assam 2030 requires "back-casting" the vision and targets of the state in 2030 to the present and the intervening period till 2030 and figuring out the required physical outputs, activities, and resources both human and financial to achieve them. The resources required to achieve this vision is discussed below.

i. **Financial resources.** Necessary arrangement / mobilization of adequate financial resources is quite critical, for achievement of targets envisaged under SDG 3 and 6. Hence it is utmost necessity to establish linkages between the SDGs and all sources of funds such as NRDWP/ SBM-G / Externally Aided Projects / CSR strategies and existing state and central sources of funding. The order of financial resources necessary have been indicated in Appendix 9.1.

ii. **Human resources.** To meet the scale of service delivery envisaged under Vision 2030, major organizational reforms will be needed. The Health Department will set up a Human Resource Team for this purpose. Its tasks will include **identifying and filling HR gaps.** Gaps in Human Resources as per WHO norms will need to be filled. For doctors, for example, the norm is 1:1000 population. The current ratio for Assam is **1:9788 (in the public sphere).** This gap must be reduced substantially both through systemically recruiting people, giving adequate training and paying competitive salaries. Similar gaps will be identified and filled for other medical staff and specialists as per National Health Mission norms. This will be done in a phased process with advanced planning given the gestation period involved in acquiring doctors and other health staff.

To meet the scope of service delivery standards envisaged for clean water and sanitation under SDG-6, a similar exercise is necessary and will be carried out. The Human Resource Team for WASH will look at particularly (i) the HR needs for field offices which requires strengthening of M &E and better coordination along with Quality Control with all concerned stakeholders; and (ii) to take care of multidimensional scope of works related to environmental management; social mobilization and institutional re-structuring; ICT interface to enhance the level of service delivery; externally aided projects and CSR initiatives; and Research and Development and impact assessment for course correction.

iii. **Infrastructure requirements.** Necessary infrastructural gaps will be identified and filled both in the health and water supply and sanitation sectors to meet the service delivery coverage required including for the entire rural population at accepted quality standards

according to established norms. The current infrastructure gaps are large. In sanitation for example, almost 50% of the state remains uncovered. Physical infrastructure gaps regarding hospitals and health centers will have to be first fulfilled in the most deprived and marginalized areas for ensuring good health for all. The Intervention Mapping Exercise should be able to give a clear picture of the most marginalized areas within the state and assist in creating action plans for infrastructure provision in these regions. Mechanisms will be developed also to ensure proper maintenance of facilities created. Gaps identified will be filled through several mechanisms including PPP models, collaborations with private partners, outsourcing etc. Guidelines will be developed by June 2018 for infrastructure development in the state and their maintenance according to norms.

For WASH sectors too, necessary infrastructural requirements shall have to be initiated to cater to expanded service delivery to achieve the SDG-6. To start with, the Quality Control aspect needs to be addressed with an outreach for all activities. All PHE Sections also must have adequate office arrangements, unlike the present condition, to enable a better delivery approach and also to make it even closer and accountable to the rural community.

6. Coordination arrangements for implementing Goals 2 and 6

Goals	Lead Departments	Supporting Departments		Cross Cutting Departments
Goal 3 Good Health and Well Being	Health & Family Welfare	Education, Public Health Engineering (Water and Sanitation),	Excise, PWD (Rural Roads and Road Safety), Transport	Social Welfare (Gender), WPT & BC, Tea Tribes Welfare, Minority Development, Char Areas, Hill Areas, Science & Technology, Information Technology, Information & Publicity. Transformation and Development Department (Oversight)
Goal 6 Clean water and sanitation	Public Health Engineering	Water Resources,Urban Development, Guwahati Development		

Chapter 3:
Promoting inclusive and quality education for all

Goal 4: Ensure inclusive and quality education for all and promote lifelong learning opportunities for all in Assam by 2030.

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Promoting inclusive and quality education for all

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1. Introduction

This chapter discusses the Sustainable Development Goal 4 on inclusive and quality education. Consistent with this Goal, the Government of Assam has adopted a vision of ensuring by 2030 that "all children (will be) in school and (experiencing) learning with quality within and outside schools, "signifying its determination to achieve universal access to inclusive and quality education at all levels of education from primary to tertiary and for truly achieving *Sabka Saath, Sabka Vikas'*. Education is the main driver of development, especially in achieving all the other SDGs. Education plays a key role in eradicating poverty, generating decent work, raising incomes and workers' productivity that fuels economic development. It creates opportunities for human development and is also a means of achieving gender equality, by empowering girls and women to fully participate socially, politically, and in the work force. Education also contributes to improving health, especially in combating diseases, malnutrition, and improves maternal and child care amongst others.

Assam ranks low in education attainments, finishing 30th among 35 states and union territories in the composite educational development index (EDI)[15] in upper and lower primary levels taken together for the year 2013-14 in the country. Identifying where schools are failing to meet their commitments to children, is vital to formulate appropriate actions towards addressing education gaps. There are over 47,000 primary schools in Assam with 54,32,053 children enrolled in 2015-16[16]and 1,06,646 children who are out of school – roughly 1.9% of the total population of children in the age group of 6-14 years.[17] The Gross Enrolment Ratio (GER) and Net Enrolment Ratio (NER) at upper primary levels for the state is 80.7 and 67.5 respectively. The GER and NER again both fall considerably at secondary levels with 74.6 and 53.5 respectively indicating relatively poor enrolment levels as children move from primary to secondary.1In

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[15]*EDI comprises of The EFA Development Index (EDI) is a composite index using four of the six EFA goals, selected on the basis of data availability. The goals are: Universal primary education (UPE), Adult literacy, Quality of education and Gender. For information: http://en.unesco.org/gem-report/education-all-development-index*
[16]*U-DISE 'School Education in India Report', 2015-16*
[17]*SSA Assam, 2015-16*

higher education, GER is lower still at 16.8% which is also far below the national goal of 32%. Currently the Government is pursuing many programmes at all levels of education. In 2014, the Government of Assam rolled out the National Early Childhood Care and Education (ECCE) Policy recognizing the importance of investing in Early Childhood Development and its impact on lifelong development and on breaking the inter-generational cycle of inequity. There are critical gaps in the quality of pre-primary/early childhood education (ECE) programmes, gender differences in preschool/primary school participation, both with respect to government-run Anganwadi Centres (AWCs) and private preschools, with low school readiness levels in children, particularly cognitive and language skills required for school. Issues related to lack of appropriate curriculums, learning materials, funds and convergence of all departments need to be addressed.

In school education, the Government is vigorously implementing the Right of Children to Free and Compulsory Education Act 2009 which mandates that every child in India aged 6 to 14 years has the right to quality, inclusive and child friendly education. Nevertheless, there are still 106,646 out of school children (OOSC) as of 2015-16 of which 69,862 are at lower primary level and 36,784 at upper primary level. Assam envisions a total elimination of out of school children by 2030. The quality of school education also remains very poor. According to ASER estimates in 2016, only 49.5% of children in standard III to V could read a standard I text while only 34.9% of them could do simple subtraction; and amongst children studying in Class VI-VIII, only 54.7% could read at least Std. II text and only 22% could do simple division. Moreover, as per National Achievement Survey, conducted by MHRD, 63% and 66% of Class III students could successfully answer questions on Language and Mathematics respectively while only 47% and 53% of Class V students respectively could do the same. To improve the quality of learning areas of priority are teacher training, absorption of more teachers into the system, need for technological upgradation and use of ICT tools and improving community involvement.

In higher education, access and quality are issues too. Developing outcome based learning processes through courses which promote employable manpower, appropriate infrastructure for promoting these forms of learning along with adequate human resources for teaching are critical at this level. In technical education, the Government is determined to give access to technical education to all corners of the state by establishing more technical institutions in the state and upgrading the existing ones to national level institutions. The Government proposes to expand the number of Engineering Colleges from 4 to 10 and Government Polytechnics from 10 to 31 by 2020. Establishment of a Women's University, a Science and Technology University, introduction of skill development initiatives by community colleges, · expansion of Engineering Education through the private sector and constituent colleges of Universities, and undertaking Collaborative Research Projects with University of Melbourne, and Curtin University are some other recent initiatives.

I. Indicators and targets

Table 3.1: Early Childhood and Elementary education indicators: baselines and targets

Indicators	Baseline (2016-17)	Target (2019-20)	Target (2023-24)	Target (2030-31)	Remarks
Proportion of age 3+ pre primary children being provided ECE	49.80(2008)	58.20	84.20	100.00	
Gross Enrollment Ratio (GER) (upper primary)	80.75	85.25	100.00	100.00	GER & NER of Lower Primary level has already been achieved. However, GER & NER target has been fixed for Upper Primary level.
Net Enrolment Ratio (NER)(upper primary)	67.54	72.54	100.00	100.00	
Proportion of Out-of-school Children (OoSC) (%)	1.91	1.4	1.00	0.00	
Dropout rate					
Lower primary	15.4	12.4	8.4	0.00	
Upper primary	10.5	8.5	6.0	0.00	
Retention rate					
Lower primary	68.75	74.75	81.75	100.0	
Upper primary	87.40	91.40	94.4	100.0	
Learning outcomes (lower primary)					
L-I	53	72	100	100	
Math	61	72	100	100	
EVS	51	65	100	100	
Learning outcomes (upper primary)					
L-I	58	65	100	100	
Math	38	57	100	100	
Science	45	60	100	100	

Source: DISE 2015-16

Table 3.2: Secondary education indicators: baselines and targets

Indicators	Baseline (2016-17)	Target (2019-20)	Target (2023-24)	Target (2030-31)
GER	74.62	81.82	87.12	100.00
NER	53.5	66.3	76.3	100.0
Dropout rate	17.0	12.0	8.0	0.0
Retention rate	79.4	85.2	89.6	100.0
Learning outcomes NAS 2015 Score (core subjects)	38.0	55.0	100	100.00
Vocational enrolment (proportion of secondary enrolment)	2.0	5.00	12.00	25.0

Source: DISE 2015-16

Table 3.3: Higher Education indicators: baselines and targets

Indicators	Baseline 2016-17 to 2018-19	Target 019-20 to 2021-22	Target 2022-23 to 2024-25	Target 2030-31
Enrolment	402154	628963	793249	999493
Number of Universities	12	15	18	21
Number of Colleges	301	311	315	325
Number of Teachers	12972	20962	22664	24987
Pupil Teacher Ratio (PTR)	31	30	30	20

Source: Department of Higher Education Data

Table 3.4: Technical Education indicators: baselines and targets

Indicators	Baseline (2016-17)	Target (2019-20)	Target (2023-24)	Target (2030-31)
No of Govt. Engineering Colleges	04	10	10	14
Intake	1095	2175	2175	-
No of Polytechnics	10	31	31	-
Intake	1545	5325	5325	-
No of Community Colleges	06	31	35	35
Intake	1100	6200	7000	7000

Source: Department of Technical Education data

3. **Major strategic interventions proposed**

A. **Expanding access to education for all**

Education for All requires ensuring that all children have access to basic education of good quality. The Government of Assam is determined to achieve this vision. To achieve this vision, it will create an environment in schools and in basic education programmes in which children are both able and enabled to learn. Such an environment will be inclusive of children, effective with children, friendly and welcoming to children, healthy and protective for children and gender sensitive. Quality education will be achieved by improving learning outcomes, through strengthening inputs for education, processes and evaluation of outcomes and mechanisms to measure progress. Special attention will be paid to the following areas.

i. **Focus on Early Education Interventions:** Good quality education is the first step towards lifelong learning processes. The Government will accordingly emphasise on all the seven components UNICEF considers critical for developing early education namely; 1. Physical learning environment, 2. Teaching and learning processes, 3. Teacher quality, 4. Curriculum, 5. School readiness outcomes, 6. Leadership, 7. Parent and community involvement

ii. **Bringing all Out of School Children (OOSC) within schooling.** As highlighted in the Introduction to this chapter, over one lakh children of primary school going age remained out of schools, of which around two-thirds of OOSC were in lower primary and one third in upper primary levels. All efforts will be made to bring all these children into the school system so that by 2030 none are left out.

iii. **Inclusive schooling.** Making efforts to include all sections of the student population is essential for ensuring access to education for all. The Government will make school environments and curriculum appropriate for the ethnic and cultural backgrounds of the students and promoting sustainability as a core element in the educational platforms. Continued efforts to encourage secondary schooling and tertiary education of women will continue to be made to ensure gender parity at all levels of education by 2030.Special efforts to include students with disabilities will also be made. Provisions will be made in every school to cater to the needs of students with disabilities. Regulations for both public and private schools will mandate creation of disabled friendly infrastructural facilities (such as toilets/ classrooms etc.) Provision for specialised teaching for such children will also be available. The Government also plans to expand the hostels for women, SC/STs and persons with disability.

iv. **Ensuring rapid expansion of secondary school enrolment.** Vision 2030 in line with the SDGs envisions rapid expansion of enrolment in secondary education from a net enrolment ratio (NER) of a little over 50% currently to 100% by 2030. The Government is determined to

meet this massive expansion target with provision required physical and human resources as needed (see Section 4 below).

v. **Expansion of higher and technical education.** In keeping with the SDGs, Vision Assam 2030 aims to expand access to higher and technical education to students in the state. A large expansion of higher and technical education institutions is therefore planned by the Government as shown in Tables 3.3 and 3.4 above.

vi. **Sports for health and Joyful learning:** Sports is critical for nurturing young children's development and for joyful learning. An annual sports calendar in synchronization with the academic calendar for active participation of students in sports competitions and basic sports facilities in schools and colleges and making sports an integral part of the curriculum of schools would be prepared by January, 2019. In addition, in order to identify sports talent and develop sports skills, a scheme for advanced talent determination, and engagement of professional coaches for specific sports etc. will be taken up; and at least one teacher from each school trained as physical instructor by December 2020.

vii. **Fostering partnerships in education to improve access.** To improve access in all levels of education, government plans to expand and strengthen partnerships. The Government will involve all stakeholders, including the Departments of Primary and Secondary Education, Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA), Board of Secondary Education (SEBA), Assam Higher Secondary Education Council (AHSEC) in the process. To ensure greater private sector participation in the Technical Education sector, it is planned to set up an Industry Institute Partnership Cell (IIPC) to encourage co-operation between industries and technical institutions. Other actions include undertaking joint projects relating to specific state needs, and organizing industrial visits and training of students and faculty for technical education. Grant funders, foundations and donors who are interested will also be contacted and encouraged to support such efforts including scaling up research and innovations in universities and other educational institutions.

Of importance is **partnership with parents and communities** in delivering education. Involvement of parents and communities are particularly relevant for early childhood education and school education. The Government will make every effort to ensure greater involvement of parents and panchayati raj institutions (PRIs) and municipal governments so that no children are left out; providing better environments for pupils within and outside the schools; and better home environments for learning

B. **Improving quality and efficiency of public services in education**

Education is of little value if it is of poor quality. The Government is determined to improve quality in a time bound manner as measured by the indicators set out in Tables 3.1

and 3.2 for school education. For higher and technical education too, the Government will establish monitorable quality indicators by December 2018 (such as dropout rates, teaching quality, adequacy of infrastructure, placement rates etc.) and use them to measure improvements in quality till 2030.At the same time, major efforts will be made to improve efficiencies in delivery of education services at all levels. The most critical interventions in these areas are discussed below.

i.   **Improving quality and reducing dropout rates in school education:** As highlighted in the Introduction, the quality of school education remains very poor. Poor quality and lack of enabling school environments leads to poor regularity at school. Additionally, students may not be receiving needed attention from teachers, leading to learning challenges and drop-outs. To reduce drop-out rates the Government will strengthen the quality of education, provide support to students who are getting left behind through remedial or additional classes, and through para-teachers to provide additional support. This will ensure that all children get attention and quality education. Improving the quality of classrooms and facilities in schools especially clean water for all and separate toilets for girls and boys will also be emphasized. Nutritional supplements and access to transportation which are also critical for preventing dropouts will be focused on. Students will also be provided with health services in schools to ensure retention, good health and well-being for overall development.

ii.   **Quality assurance of higher education institutions.** A State Assessment and Accreditation agency will be established in line of the NAAC to administer Academic and Administrative Audit (AAA) of Higher Educational Institutions in the State. The quality of individual teachers in higher education will also be tested regularly by developing standardised tests and improving quality of existing testing methods and creating additional certification processes to assess their capacities, knowledge and skills.

iii. **Human Resource (HR) expansion and capacity building:** Improving the adequacy and quality of teachers is essential for improving the quality of education. The Government will therefore develop by June 2024 a comprehensive HR policy covering areas of recruitment; transfer and capacity building of teachers (including training in teaching, leadership skills and developing a learning conducive environment); creation of new and strengthening of existing Teacher's Training Institutes (DIET, TTIs, CTEs etc); recruitment and filling up of vacancies relating to administrative and technical positions; strengthening community engagement and participation. The number of Teacher Training Institutes (TTIs) will be increased from 61 currently to 87 by 2024 where trainers will be trained themselves as per global standards.

iv. **Curriculum development.** The Government intends to thoroughly review and revise textbooks and curriculums to make learning more interesting, enjoyable and useful. Use of ICT

and technological innovations will be actively considered also (see further in section on Technological Innovations). Curriculum and textbooks will be revised by 2020.

v. **Developing vocational and skills-based learning:** The Government will place special emphasis on quality vocational education to equip students with skills for specific skill intensive trades and occupations to meet labour market needs and reduce youth unemployment. Strategies to be adopted will focus on skills gap analysis, inclusive approach and developing appropriate policies and institutions to further skills development and employment. The vocational stream in secondary education will be expanded as indicated in Table 2 to reach a quarter of all secondary enrolment by 2030. Secondary schools and post-secondary technical institutions will have needed technical equipment and workshops to impart quality vocational education. Skills based learning beyond secondary level will include practical training and professional advancement courses which are professionally certified. The practical relevance of such vocational education and training will be chalked out with strong linkages to private organisations and in close partnership with them to ensure future employment. Sustainable financing models for the graduates of vocational education and training will also be developed. Special attention to skills and vocational training of girls and women will be provided. (A more detailed discussion on skills development is provided in Chapter 5 on Growth, Industry, Infrastructure and Employment).

vi. **Diversifying learning and expanding career choice:** Students enter schools/colleges with diverse interests and needs. The Government will therefore provide students more options for choosing between a variety of programmes and formats best suited for their needs. Government plans to introduce a larger number of Diploma and Certificate courses in engineering, technical and service sectors such as tourism, accountancy etc.

vii. **Infrastructure and facilities improvement:** Education infrastructure improvements to provide better learning environments and facilities will be pursued. Proper laboratories, libraries and computing facilities in schools and colleges, and toilets and drinking water facilities will be ensured. For higher education, existing infrastructure of universities and institutes will be upgraded simultaneously with increasing intake capacity. Similarly, in technical education, modernization of existing technical institutions will be pursued along with expanding the number of State Engineering Colleges/polytechnics.

viii. **School Safety.** In Assam which is prone to floods and faces earthquake risks, safety of schools and educational institutions is a priority of the Government. Creating safe conditions requires attention to three critical areas: 1) safe school environment and facilities; 2) disaster risk reduction in schools and educational institutions; and 3) student protection in schools and educational institutions. A comprehensive policy framework covering these three areas along with functional institutional mechanisms will be developed by December 2030. All

levels of the education sector will be covered and will be integrated with the state's overall disaster and emergency response mechanisms.

Developing Monitoring Framework:

Monitoring mechanisms which are existing will to be strengthened to better gather and analyse data to assess and monitor the quality and outcomes of education services, with a view to increasing both effectiveness and efficiency. The data generated needs to provide evidence to support policy, regulatory, planning and advocacy processes. Monitoring will also be conducted to ensure equity (across gender/ children with disabilities/ SC/ST/ other deprived groups); and to improve educational services to different population groups, based on their needs.

C.   Fostering technological innovations in education

The Government intends to prioritise the use of new technology and innovations in education to achieve its major objective of expansion of access to quality education for all by 2030. The main areas where technology and innovations will be pursued are the following.

i.   Using technology to expand access: The Government intends to use technological innovations to achieve rapid expansion of access to secondary and higher education. Secondary schools and higher education institutions will be equipped with ICT infrastructure including telephone and high-speed internet connectivity to enable teachers to teach larger number of students using innovations in teaching methods using ICT, computing and other new technologies. Use of virtual classrooms, use of digital lessons, grading work through computers etc. are some ways already in use which will be actively explored and used. This will require revamping of ICT and computing infrastructure including providing physical space for safe storage of equipment, stable internet and electrical connections with power backup, maintenance services etc.

ii.   Technology for curriculum improvement, fostering learning friendly environment, evaluation etc : New education technology will be used to remove obsolescence of curriculum and course content at all levels of education. Technology will be used to deliver learning friendly course content using more professional and interactive IT tools. In the technical education area, collaborative research project with a top ranking global educational institution such as the University of Melbourne, Australia will be taken up. Programs and courses in new and emerging areas such as Bamboo Technology/Tea Technology/Drilling Technology/Food and Fruit Processing Technology/Cold Storage Technology etc. will be introduced. Standardised tools and methodologies to improve evaluation of students and teachers will also be introduced.

iii.   Promoting teacher training and management and governance of education: The Government will maximize the use of new technology and innovations for teachers' professional development, as well as to improve education management, governance and administration.

D. Policy Changes and Organizational reforms to facilitate service delivery

The Government intends to make policy reform a constant process by assessing the functioning of the current education system; identifying gaps; and ensuring that all policies and programmes are meeting the needs of students, teachers and all stakeholders engaged in imparting quality education.

i. **Policy strengthening:** The policy framework to better achieve education outcomes will be scrutinized annually to see if there are policy or regulatory constraints affecting better service delivery. The first such thorough scrutiny will be conducted by March 2020. Policy areas that need review include all intervention areas listed under subsections (A) to (C) discussed above. As the private sector will be encouraged to play a vastly bigger role in education, policy changes to encourage its greater participation will be a critical component of this exercise.

ii. **Organisational reforms:** The Education Department will strive to improve coordination with other departments to ensure all-round development of children and youth. Apart from better coordination between the school and higher education departments, coordination with the Social Welfare Department (for Early Childhood Education); Labour Department (for skills and vocational education); Health Department (for Medical Education); and various departments responsible for development of specially deprived groups such as WPT&BC, Char Areas, Border Areas, Hill Areas etc. will be crucial. Improved organizational arrangements for ensuring better coordination will be explored by March 2020. Organizational changes will also consider creation of better functioning platforms to ensure greater exchange of ideas and concepts between stakeholders.

4. Planning for resource requirements in education

i. **Financial resources.** The required expenditures based on the strategy developed to ensure inclusive and quality education for school education, higher education and technical education in the state is shown in Appendix 9.1 of Chapter 9. Financial resource requirements are based on (i) minimum of 20% reduction because partnerships with private sector, communities, civil society etc.; and (ii) minimum 20% reduction through efficiency gains and technical and other innovations.As shown in Appendix 9.1 of Chapter 9, a resource gap still exists even with a significant burden being assumed to be shared by the private sector. The Departments will undertake a plan to eliminate the gap to achieve Assam's vision for education in the state through measures such as securing additional resources from outside the state (additional Central assistance and international funding).

II. **Human Resources.**Apart from financial resources, a strategy for developing human resources is necessary to achieve Assam's Vision 2030 for the education sector. Fortunately,

the student-teacher ratio at different education levels in Assam is highly favorable compared to the rest of India which makes the additional requirement of teachers to achieve Assam's Vision 2030 easier to achieve. However, there is considerable variation across education institutions and there is a significant gap in human resources that needs to be filled as shown in Appendix 1, 2, 3.

The additional teacher requirements will be filled through active measures to train teachers and recruit them. More attention to producing better quality teachers will be made. The additional teacher requirements at the secondary level may be lower than projected as it is proposed to introduce web-based and self-learning strategies by 2030.

iii.   **Infrastructure requirements.** School and higher education physical infrastructure will also need to expand along with growth in education services in line with Vision 2030. The Strategy for education particularly emphasizes the following areas.

Although expansion of access is more essential in Assam at the secondary level, even at the elementary level additional infrastructure is required to achieve Vision 2030. This is because schools that were built some time ago require infrastructure support/retrofitting/major repairs including provision of toilets etc. There is also a requirement for electrification (external & internal) as most elementary and secondary schools do not have electricity. This also prevents them from providing ICT based education and leveraging the efficiency of new technologies. Additional infrastructure requirements include: requirement of boundary walls and other infrastructural needs in elementary schools, computer labs, science/math labs etc.

To give access to both higher and technical education in all corners of the state, there is a construction requirement of more higher education and technical education institutes. Moreover, there need for upgradation of existing institutions to increase the intake capacity. This significant gap of infrastructure in all levels of education need to be filled up by 2030 as shown in Appendix 3.4 to 3.7.

3. **Coordination arrangements for Goal 4.**

Goals	Lead Department	Supporting Departments		Cross Cutting Departments
Goal 4Quality Education	Education	Social Welfare (Pre-primary Education), Labour and Employment (Coordination on skills development),	Cultural Affairs, Sports & Youth Welfare.	Social Welfare (Gender), WPT & BC, Tea Tribes Welfare, Minority Development, Char Areas, Hill Areas, Science & Technology, Information Technology, Information & Publicity. Transformation and Development Department, and Finance Department (Oversight)

Appendix 3.1. Projection of teacher requirements in the school system

	2016-17	2019-20	2023-24	2030-31	Remarks
Elementary teachers (Govt. & Provincialized) needed	168631	173566	181062	196243	1. Supply of Teachers- Primary (30:1 ratio) 2. Supply of Teachers - Upper Primary (minimum 5 teacher for UP and 7 teachers for MV and for high enrolment as per PTR 1:35.)
Additional elementary teachers needed over 2015-16	6462	4935	7496	27612	(Excluding vacancy position).
Secondary teachers (including private) needed	52000	52000	53540	69000	
Additional secondary teachers needed over 2015-16	0	0	1540	14000	

Source: UDISE (2015-16) and Department's calculations

Appendix 3.2. Projection of teacher requirements in the Higher Education

	2016-17	2019-20	2023-24	2030-31
Number of Universities	12	15	18	21
Number of Colleges	301	311	315	325
Number of Teachers	12972	20962	22664	24987
PTR	31	30	30	40

Source: Department of Higher Education

Appendix 3.3 Projected scenario of employees under Technical Education in 2019

Type of Institution	No. of Institution	Faculty	Other staff	Total	Faculty to Students Ratio required as AICTE
Engineering Colleges	14	634	1038	1672	1:15
Polytechnic	31	969	2410	3379	1:20

Source: Department of Technical Education

Appendix3.4- Projections of classrooms and other infrastructure needed (Elementary)

Target for Access:	2016-17	2019-20	2023-24	2030-31
New School Building (Primary)		24	0	0
New School Building (Upper Primary)		60	44	0
Residential Schools		5	4	0
Digital Schools		50	50	0
Addl. Class Room	1511	11964	16268	11000
Dysfunctional toilet-repairing		11060	0	0
Drinking water facility	0	4112	0	0
Ramp with rail	0	7936	2500	0
Boundary wall	0	10606	16000	7971
Retrofitting / Major repair	508	4500	6000	4586
Electrification (External & internal)	0	13917	14500	9500
Requirement of Desk-Bench		213003	213003	0

Source: Department of Elementary Education

Appendix 3.5- Projections of classrooms and other infrastructure needed (Secondary Education)

Target for Access	2016-17	2019-20	2023-24	2030-31
Secondary classrooms needed	15100	16772	19652	27014
Laboratories	2124	3315	4052	5052
Libraries	980	3170	3929	3929
Vocational workshops	304	1066	3795	8713

Source: Department of Secondary Education

Appendix 3.6- Projections of classrooms and other infrastructure needed (Higher Education)

Target for Access	2016 -17	2019 -2020	2023 -24	2030-31
Commissioning of Govt. Model Degree Colleges	5	3	3	1
Infrastructure development of Colleges	44 Nos.	100	100	100
Introduction of Vocational Courses	5	5	5	5
Upgradation of existing Colleges to Universities	0	1	1	1
New Private Universities	2	2	2	2
Recruitment of Teachers	700	900	1000	1500
Training of Existing Teachers	2000	2500	3000	4000
Introduction of new courses	12	25	50	50

Source: Department of Higher Education

Appendix3.7a. Projections of classrooms and other Infrastructure Requirements (Technical Education) Existing technical Institutions (2016-2019)

Sl.No.	Category of Institution	Infrastructure	Likely Number
01.	Existing Engineering College (04Number)	Up-gradation of Laboratories	20
		Modernization of Workshop	04
		Modernization of Library	04
		Development of Video Conference Room	04
		Up-gradation of Centralized Computing Center	04
		Setting up of Industry Institute Partnership Cell (IIPC)	04
		Setting up of Training & Placement Cell	04
		Setting up of R& D and Consultancy Service Cell	04
		Setting up of Entrepreneurship Development Cell	04
		Additional infrastructure for introducing new courses	.....
		Additional infrastructure for increasing Intake in existing courses	....
02.	Existing polytechnics (10 number)	Up-gradation of Laboratories	60
		Modernization of Workshop	10
		Modernization of Library	10
		Development of E-Learning for accessing courses	10
		Up-gradation of centralized Computing Center	10

SI.No.	Category of Institution	Infrastructure	Likely Number
		Setting up of Industry Institute Partnership Cell (IIPC)	10
		Setting up of Training & Placement Cell	10
		Setting up of R& D and Consultancy Service Cell	10
		Setting up of Entrepreneurship Development Cell (EDC)	10
		Additional infrastructure for introducing new courses	.....
		Additional infrastructure for Increasing Intake in existing courses	.....
03	Community College	Setting up additional facility for Community College in existing and new Polytechnics	31
04	Woman University at Jorhat	Additional infrastructure for introducing new courses	----
05	Assam Science & Technology University at Guwahati	Additional infrastructure for introducing new courses	-----
06	Directorate of Technical Education	Establishment of Curriculum Development Cell	01

Source: Department of Technical Education

CHAPTER 4:
Reducing Gender and other Inequalities: Leaving No-one Behind

Goal 5: Achieve Gender Equality and Empower All Women and Girls
Goal 10: Reduce other inequalities within Assam

1. Introduction

This chapter focuses on a key principle of the Sustainable Development Goals (SDGs) – namely that no-one should be left behind– by focusing on three broad sources of inequality in the state causing deprivations among certain specific groups and areas now lagging in development. These are: (i) gender inequality; (ii) inequalities from social discrimination that have deprived certain communities and groups in the population from participating effectively in the development process such as scheduled castes (SCs), scheduled tribes (STs), other backward classes (OBCs), the tea garden labor (TGL) community, minorities, people with disabilities and the elderly; and (iii) inequalities caused by certain geographical and locational disadvantages such as hill areas, char areas and border areas.

Gender inequality is one of the biggest challenges facing the state. This is manifested in much lower levels of social attainments in terms of education, accessibility to healthcare leading to high MMR and high rates of violence against women. The number of cases of violence against women (VAW), for example, is generally higher than elsewhere in India. This is also a reflection of the higher number of reported cases in the state. The rate of crime committed against women during 2015 shows a staggering rate of 148.2 per 100,000 women in the population (rate of total cognizable crimes) versus the national rate of 53.9 (among 29 states of India).[18] The Government of Assam has therefore accorded the highest priority to this issue and has recently adopted the Population and Women's Empowerment Policy of Assam (PWEPA) on 15 September 2017, where women's empowerment as well as issues around child marriage, livelihood constraints, unemployment, illiteracy, high infant and maternal mortality rates (IMR and MMR) have been addressed.

The other two major sources of inequality need to be addressed too. Assam's population is a rich tapestry of ethnically diverse populations which contributes to its cultural diversity but also poses a challenge in terms of serving their specific and varied needs. Several such groups

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[18] *Rate of Total Cognizable Crimes: Rate of Total Cognizable Crime = (Incidences of Crimes against Women/Female Population) x 100000 i.e., Incidence of Crime per one lakh of Female Population. Refer to: http://ncrb.nic.in/StatPublications/CII/CII2015/chapters/Chapter%205-15.11.16.pdf*

have suffered discriminations and lag behind the general population in the state. People with disabilities and the elderly have also lagged behind. The third source of inequality is geographical. Certain geographical regions in Assam such as hill, border, and char areas also need more focused attention to achieve the SDGs by 2030. These areas have fallen behind due to a lack of infrastructure and inadequate coverage of basic services such as health, education and livelihood generation and their gaps in basic development outcomes need to be reduced substantially for the entire state to progress. Addressing specific needs of these communities and areas will require strategic interventions focused to the specific binding constraints faced by each —such as better education and healthcare systems in tea areas which are their greatest need; or disaster preparedness mechanisms amongst other needs in char areas which are particularly vulnerable to floods. To better assess and monitor progress of such deprived and marginalized groups, more disaggregated data is necessary and is of the highest priority. Available data indicates that deprivations are severe in these communities.[19] This chapter discusses measures essential to address all such inequalities and discriminations in Assam.

2. Goals and Indicators

In order to better track the state's progress in reducing gender and other inequalities, disaggregated data on the socio-economic attainments of such groups is essential which is difficult to obtain. The following is an initial set of indicators which will be built on and improved.

Table 4.1: Indicators with baselines and targets

Sl. No.	Indicators	Baseline 2016-17	Target 2019-20	Target 2023-24	Target 2030-31
1.	Ratio of female to male literacy (15-24 years)	0.93 (2011)	0.95	1.0	1.0
2.	Ratio of female to male work participation rate	0.40 (2011)	0.45	0.60	1.0
3.	Proportion of seats in the state assembly occupied by women (% to total elected members)	6.35 (2016)	15.0	33.3	33.3
4.	Proportion of women within 20-24 years getting married before the age of 18 (%)	32.6 (2015-16)	15.0	0.0	0.0
5.	Proportion of women within 15-19 years who are mothers or pregnant (%)	13.6 (2015-16)	Reduce	Reduce	Reduce to zero
6.	Coverage of Adolescent Girls' Scheme in Assam (number of districts)	8	27	32	Sustain effort
7.	Rate of crime against girl child (per 100,000 girls)	34	22	10	0

[19] Human Rights Watch (2013), Discrimination, Inequality, and Poverty—A Human Rights Perspective Accepted under the "Addressing Inequalities" Global Thematic Consultation - Call for Proposals for Background Papers, 2012 https://www.hrw.org/news/2013/01/11/discrimination-inequality-and-poverty-human-rights-perspective

Sl. No.	Indicators	Baseline 2016-17	Target 2019-20	Target 2023-24	Target 2030-31
8.	Conviction rate under Prohibition of Child Marriage Act 2006	5%	40%	80%	100%
9.	Proportion of districts covered by State Specific Project to combat child marriages	0%	100%	Sustain effort	Sustain effort
10	Conviction rate in cases of trafficking	9%	24%	60%	100%
11	Cases of human trafficking per lakh population	4.6 (2015)	3.0	1.5	0.0
12	Destitute & vulnerable women availing shelter & rehabilitative services under state scheme (%)	10.0	40.0	80.0	100.0
13	Proportion of poor women availing vocational training and other rehabilitative services (%)	< 5.0	40.0	100.0	Sustain
14	Proportion of victim women availing free legal aid services (%)	< 5.0	50.0	100.0	Sustain
15	Proportion of women victim of trafficking availing rehabilitative services under Ujjawala (%)	< 5.0	50.0	100.0	Sustain
16	Proportion of women availing maternity benefits and other assistance during pregnancy (%)	< 5.0	50.0	100.0	Sustain
17	Proportion of girls with special needs availing education in schools under inclusive education (%)	80.0	90.0	100.0	Sustain
18	Proportion of districts covered by One Stop Centre for empowering women (OSC) (%)	15.0	45.0	91.0	100.0
19	Crime rate against women (per 100,000 women)	148.2 (2015)	100.0	50.0	25.0
20	Proportion of households aware about safe migration (%)	20.0	50.0	80.0	100.0
21	Proportion of children with disabilities enrolled in special schools for persons with disabilities (%)	NA*	33.3	63.6	100.0
22	Proportion of persons with disabilities who have availed aids and appliances from Government (%)	19.3	50.0	100.0	Sustain
23	Proportion of public buildings accessible to persons with disabilities (%)	< 5.0	25.0	70 %	100 %
24	Gini inequality co-efficient of inter-district per-capita district GDP	0.16 (2014)	Reduce	Reduce	Reduce

Note: Figures in parenthesis show year of baseline data

Source: Social Welfare Department, Assam (SPAP Document)

*Consolidated data of Children with Disabilities in Schools to be generated through systematic study by 2019.

1. **Major strategic interventions proposed**

   A. **Achieving gender equality and women's empowerment.**

   As shown in Table 1, the indices for women remain unsatisfactory in Assam and major improvements have been planned by the Government. The main interventions proposed are grouped into the following three areas.

   i. Economic empowerment. Economic empowerment is essential for improving the condition of women. The Government's interventions will include:

   a. *Expanding literacy, education –including vocational education– and skill development.* Education of women is essential for expanding their earning opportunities. While Assam has achieved gender parity in education, women's learning outcomes as indicated by literacy for instance continue to lag behind men. The 2011 census indicates that as against a literacy rate of 77.8% for men, women's literacy stood at 66.3%.[19] The Government will make efforts to achieve a 100% literacy rate for women by 2030. In addition, the Government will stress on expanding women's education. At present the mean years of schooling for females stands at 5.32 years while for males it is 6.97 years.[20] In line with Vision Assam 2030, the Government will ensure that by 2030 all children including girls of school going age will complete secondary education. One obstacle to female education is insufficient sanitary facilities for girls. This will be remedied for all educational institutions at all levels by March 2019. Among others schemes, the Government will bring all districts within the *Beti Bachao Beti Padao* scheme by 2019-20 which has minimal coverage at present. The Government will also stress on vocational education and skill development for women.

   b. *Expanding women's participation in the labor force and bringing about parity in earnings with men.* Participation of women in the labor force at 15 percent remains very low; and of these, only 17 percent are employed. Women in Assam have traditionally engaged in agriculture, and therefore attention will be paid to building women's skills to help them diversify into other occupations. Women also tend to work in low paying jobs with their median earning less than half of men.[21] The Government will encourage greater participation of women in years leading to 2030 to ensure it reaches the all-India average by then. To create a better work environment for women, laws regarding safe and conducive work environments for women will be reviewed by June 2018 and amended as appropriate. More decent jobs for women are necessary and will be created with encouragement of women in all public employment; and better monitoring conducted of informal and unregulated work such as domestic services to ensure fair wages and conditions in these types of work. The Government will also ensure that the principle of

"equal pay for equal work" is scrupulously adhered to in all public establishments. By December 2020, equal payment of wages to men and women workers performing similar work will be ensured in all establishments public and private through strict implementation of the Equal Remuneration Act, 1976.

c.   *Expanding women's access to resources and entrepreneurship*: The Government will ensure greater access to financial resources for women especially through micro-finance and self-help groups (SHGs) by expanding coverage under the National Rural Livelihood Mission (NRLM) and National Urban Livelihood Mission (NULM) which is also discussed in Chapter 1. As land is a critical resource and is needed as a collateral for obtaining finance by women farmers, inheritance laws and registration of land titles in favor of women will be properly implemented to ensure that women are not deprived of their land rights and titles. Women's economic empowerment will also be furthered by the Government by promoting women's entrepreneurship, through various support structures, networks, credit provisioning and active partnerships with the private sector.

ii. **Social empowerment.** Women in Assam face numerous social constraints to their empowerment. The major interventions that will be adopted in this area include the following.

a.   *Reducing violence against women.* Violence in any form is unacceptable and all possible efforts would be made to completely remove it from society. Women and girls are subjected to heinous offences such as rape, abuse, molestation, witch hunting, trafficking etc., both at homes and in public spaces (see Table 4.1). Assam leads in trafficking of women and girls in the country. Laws and regulations already exist to eliminate these crimes (such as the Immoral Traffic Prevention Act 1956) and their strict enforcement will be pursued as indicated in Table 4.1, along with sensitization of women about such laws and their rights in partnership with communities and civil society. Some schemes that have been adopted by the state are listed in Box 1. Among immediate steps to be taken in this regard are:

- Creating awareness on evils of witch-hunting and ensuring strict implementation of penalties and punishment against people who engage in such activities through an Act.

- Create community-based management systems to address trafficking of girls and women as well as other forms of abuse, exploitation and violence against women and children.

- One Stop Centres for empowering women (OSC) will be extended to all districts in phases by 2030 (see Table 1).

- Reservation of 33% will be made for women in the next phase of recruitment of police officials.

[10] MOSPI: Women and Men in India 2016. Available at
http://mospi.nic.in/sites/default/files/reports_and_publication/statistical_publication/social_statistics/WM16Chapter3.pdf
[21] Assam Human Development Report 2014.
[22] Assam Human Development Report 2014.

- Women's cell will be established in every police station by December 2019 under MOITRI scheme.

- Establish *Ujjawala* homes for the rehabilitation of trafficked women in every district by March 2019.

a. *Ending child marriages.* According to the NFHS 4 data, about 32.6 percent of women under the age group of 20 to 24 years of age in Assam were married before the legal age of the marriage, i.e. 18 years. The Government is determined to end this practice by March 2024. Key actions include:

- Raise awareness of the need to end child marriages with the help of communities and civil society and enforce stricter implementation of laws

- Establish Special Juvenile Police Units (SJPUs) in all districts by March 2019 and strengthen their knowledge base on Prevention of Child Marriages Act (PCMA) 2006.

ii. **Political Empowerment.** Representation of women in elected bodies in assemblies and local governments is essential for reflecting their needs and priorities to help their full development and advancement. However, women's political participation is still an incomplete agenda in the state. The 73rd and 74th Amendments to the Constitution which came into effect in 1993 had provided for one third of reservation of seats for women in Panchayati Raj Institutions (PRIs) at all levels, but Assam had similar reservations already prior to these amendments and was ahead of the rest of the country in this respect. In 2011, reservation for women in Assam was further increased at all levels of PRIs to 50%. However, representation of women in the State Assembly and to Parliament has been poor. As indicated in Table 4.1, less than 7 percent of total seats in the current Assam Assembly are occupied by women. In the 16th Lok Sabha elections (2014) only 2 of the 14 seats (14.3%) from the state were won by women.1 In view of this to promote political empowerment of women, the following actions are proposed:

a. *Advocacy.* Pending legislative amendments, if any, to promote women's reservation to Parliament and State Assemblies2 the Government will intensify advocacy efforts to encourage more women to take leadership roles in political life and occupy a greater share of seats in the Assembly and Parliament and target at least to attain a share of one third in both levels by 2030.

b. *Actions to encourage women in political executive positions.* Women would also be encouraged to take a greater share of political executive positions (Presidents of PRIs and ministerial positions in state and national governments) to substantially increase their share from current levels through various capacity and leadership

building measures. disaggregation will begin in the first quarter of 2018 and is targeted to be in place by March 2019.

Box 1

Some of the current schemes for women's development and empowerment that will be adopted are:

- Rajiv Gandhi Scheme for the empowerment of Adolescent Girls (SABLA): The scheme aims to enhance the nutritional and health capacities by enabling self-development and empowerment, spread awareness about health and hygiene, upgrade their skills, mainstream out of school girl children into formal or informal education and inform and guide them about existing public service

- One Stop Centre: to provide integrated support and assistance under one roof to women affected by violence, both in private and public spaces, in a phased manner and to ensure speedy punishment to the culprits

- Ujjawala Scheme: comprehensive Scheme for prevention of trafficking, rescue, rehabilitation and re-integration of Victims of Trafficking for commercial sexual exploitation. It targets women and children who are vulnerable to trafficking and/ or are victims of trafficking for commercial sexual exploitation

- State Resource Centre for Women: implementing gender sensitive programmes, laws and schemes through effective coordination at the State level

- Beti Bachao Beti Padhao: objective of the scheme is to prevent gender biased sex selective elimination, to ensure survival and protection of the girl child and ensure education and participation of the girl child

- Swedhar Greh - to provide temporary accommodation, maintenance and rehabilitative services to women and girls rendered homeless due to family discord, crime, violence, mental stress, social ostracism or are forced into prostitution and are in danger

- Integrated Child Protection Scheme - aims at institutionalize essential services and strengthen structures for emergency outreach, Institutional care, family and community based care, counseling and support services at the national, regional, state and district levels

Source: Government of Assam Diary:2017

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[11]*Assam Human Development Report 2014.*
[14]*The Women's Reservation Bill or The Constitution (108th Amendment) Bill, 2008, is a lapsed bill in the Parliament of India which proposed to amend the Constitution of India to reserve 33% of all seats in the Lower house of Parliament of India, the Lok Sabha, and in all state legislative assemblies for women.*

B. Bringing all deprived communities into the mainstream of development

Assam is home to large groups of diverse peoples and communities several of which have fallen behind in development and therefore needs special efforts from the Government to include into the mainstream. In this section, the measures necessary to bring (i) the SC, ST and OBCs; (ii) Tea Garden Labor (TGL) Community; (iii) minorities; (iv) persons with disabilities, and (v) senior citizens will be particularly focused upon.

Table4.2 shows the relative deprivations faced by the SC, ST and OBC communities compared to the general population. As apparent, data is dated and scant emphasizing the need to develop a disaggregated database in the state. However, even this scant data indicates that in several respects (shown in bold) these communities have fallen behind.[25]

Table 4.2: Selected indicators for SCs, STs and OBCs compared to the General Population

Indicators	SC	ST	OBC	Assam
Proportion in total state population (2011) (%)	7.15	12.45	25.3	100.0
Poverty incidence (Rural) 2004-05 (%)	27.7	14.1	18.8	19.7
Poverty incidence (Urban) 2004-05 (%)	8.6	4.8	8.6	4.2*
Poverty incidence (Rural) 2009-10 Tendulkar Method (%)	n.a.	32	n.a.	39.9
Poverty incidence (Urban) 2009-10 Tendulkar Method (%)	n.a.	29.2	n.a.	26.1
Literacy (2011) (%)	77.0	72.1	n.a.	72.2
Infant mortality rate (2001) (Deaths per 1000 live births)	74.0	61.0	n.a.	54.0
Proportion of households with water connection (2011) (%)	n.a.	43.7	n.a.	54.8
Proportion of households with sanitation (2011) (%)	n.a.	43.3	n.a.	64.9
Households with access to electricity (2011) (%)	29.8**	28.0	n.a.	37.0

* Data is for others not state average; ** Data is for rural households
Source: Government of India (i) Handbook of Social Statistics 2016; (ii) Statistical Profile of Scheduled Tribes in India 2016

Apart from development related deprivations, these communities also often face prejudice and discrimination and are victims of violence. Lack of adequate voice and representation are also issues. The Government will therefore take the following measures to alleviate these problems:

i. **Develop a monitoring system with a disaggregated data base.** This has been discussed in the context of gender in the previous section and is a common issue for this entire chapter. The Government will take steps to develop such a monitoring system with a disaggregated data base as indicated in section A (iv) above to cover all targeted deprived communities including SCs, STs, OBCs, TGL community, minorities, and persons with disabilities.

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[25]Some indicators in the Bodoland Territorial Council (BTC) area with high density of tribal population are more adverse. For example, literacy rate was 67.1% only which is far less than the state average. Road connectivity is also an issue with only 58 kms per 100 square kilometers in the BTC area which trails the state average.

ii. **Expand access to basic services including basic infrastructure.** As apparent from the above tables, significant social and economic deprivations are still faced by such communities in Assam. The government will take the following actions to remedy this problem.

a. Focused attention to ensure these deprived communities attain the SDGs by 2030 along with the general population as envisaged in Vision Assam 2030. As they have generally fallen behind the general population in the state, the scale of improvement will need to be faster in their case and appropriate allocation of resources and effort will therefore be targeted towards these communities to ensure this happens.

b. Special efforts will be made to ensure that deprived populations can access public services. This includes (i) undertaking a study to be completed by June 2020 to discover obstacles and hurdles that exist for such communities and persons with disabilities to access public services. Other measures are (ii) information: large sections of such communities are often unaware of the Government's programs and schemes and therefore information and awareness campaigns will be stepped up; (iii) simplifying and improving access to public schemes so that deprived communities face less difficulties to access them; and (iv) providing capacity building assistance including vocational and skills development in keeping with their needs.

c. Special priority will be provided to stepping up targeted anti-poverty and food security interventions so that extreme deprivations are remedied even earlier among these communities and groups.

ii. **End prejudices, eliminate crimes against marginalized groups and ensure access to justice.** The Government will take measures to ensure that crimes against the SC, ST, OBC communities, persons with disabilities and others are taken serious note of and expeditious action initiated. In particular:

a. *Strict enforcement of laws* and fast redressal will be ensured. The government will strictly enforce legislation such as the Schedules Castes and Tribes (Prevention of Atrocities) Act, 1989; Rights of Persons with Disabilities (RPWD) Act 2016, etc.

b. *Access to justice* to persons from all these deprived communities who have particular difficulty in obtaining justice will be ensured. Legal awareness will be enhanced among such communities and groups with large scale awareness-raising campaigns on legal issues and their rights as citizens. Training of judicial, government officials (including local governments) and police officers will be carried out on rights and rights based issues concerning all such persons. Scope for establishing alternative

dispute resolution mechanisms will be actively explored and training of mediators and paralegals carried out to assist them and to provide free legal aid.

iii. **Expand voice and participation.** To end the marginalization of these deprived communities and groups, the Government will actively promote their participation in schemes and programs of the Government and ensure their adequate representation in politics, government and through affirmative action where legislation does not exist

a. The Government will ensure that in the design, implementation and appraisal of its public projects appropriate participation is provided to members of the deprived communities in order to make them more relevant for the concerned beneficiaries. Such participation will be fully ensured on all projects by June 2018.

b. Reservation to elected bodies at all levels is provided to some community groupings by law in Assam. Where such mandates do not exist for certain communities, Government will encourage through affirmative action adequate representation for such communities to ensure genuine participation by all.

c. Similarly legal mandates providing quotas in public employment exist for some communities. The Government will encourage private sector to also adopt affirmative action to ensure employment of all deprived communities and persons with disabilities.

iv. **Additional specific measures for the Tea Garden Labor (TGL) community.** The TGL community comprise both workers in tea plantations and TGL community living in or near tea gardens who are descendants of the original workers brought by colonial tea companies when tea plantations were established in the mid-19th century in Assam. Although tea garden workers are protected under the Plantation Labour Act, 1951, the coverage of the Act is still incomplete and implementation not fully effective. As discussed in detail in Chapter 5, the Government will ensure full implementation of the Act in a time bound manner. The Government will also adopt the following measures (in addition to the general measures discussed in (i) to (iv) above) to address the needs of the TGL community specifically:

a. A *socio-economic survey* will be conducted and completed by July 2018 to assess the gaps in social, economic and environmental needs of the TGL community and the geographical areas they live in. The survey will be used to (i) set up a data base of critical SDG indicators to feed into the state's SDG monitoring framework; (ii) develop a strategy by December 2018 for the accelerated development of the TGL community as a whole.
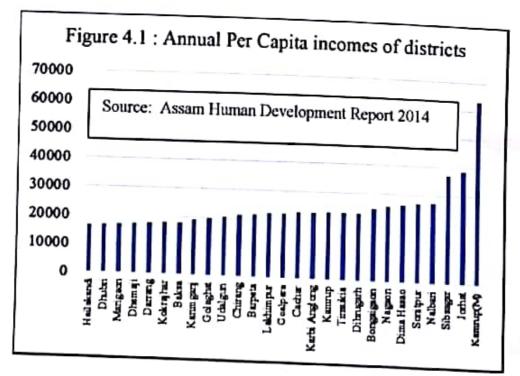
b. *Involve private tea and oil companies in partnerships* to achieve the SDGs for the TGL community. As the economy of the TGL community is to a large extent driven by the tea plantations and oil companies who are major stakeholders, the Government will begin a process of engaging the major tea associations, individual tea companies and Oil India and ONGC and encourage them to utilize their corporate social responsibility funds to achieve the SDGs in their respective areas. A partnership plan for the SDGs will be prepared for the TGL community and areas by June 2018 and jointly adopted by June 2018.

v. **Additional specific measures for persons with disability.** For persons with disability (PwD) the Government will adopt the following additional measures.

a. *Access to schools and education.* A large proportion of out-of school children are from the group of children with disabilities. One major problem for them is physical access. To address this, the Government will ensure infrastructural changes are made for ease of access such as providing ramps within the premises, both in private and public schools and colleges and universities. This program will be undertaken immediately and cover all educational institutions in the state by March 2019. Moreover, special classrooms and teachers will be provided to teach children with disability so that they do not remain intellectually or developmentally behind their counterparts. The Government will implement all provisions of the PWDA 2016 by March 2020 for inclusive education including access infrastructure and accessible education material (such as in textbooks in braille for the visually impaired) for all children with disabilities.

b. *Physical access to all public and private institutions and infrastructure for PwDs.* The Government will begin a program to ensure access to all public institutions and public infrastructure (including under municipalities and PRIs) to achieve full accessibility for PwDs in phases by March 2020. At the same time, it will encourage similar action by private sector agencies.

c. *Coverage under Aadhar.* Special efforts will be made by the Government that PwDs are provided with Aadhar cards so that they can access all services.

vi. **Additional measures for the elderly.** Senior citizens who number more than 5 lakhs, are without income earning opportunities and with increasing nuclearization of families in India find themselves without traditional means of support. The Government will adopt the following additional measures for senior citizens:

a. *Vigorous implementation of senior citizens' laws.* The Government will ensure speedy and effective implementation of the Maintenance and Welfare of Parents

and Senior Citizens Act, 2007. It has already adopted Rules under the Act in 2012 and in 2016, framed the Assam State Policy for Senior Citizens.

b. *Care facilities and incentives.* The Government will also increase the number of care facilities for the elderly in keeping with the growing elderly population; ensure the elderly get all facilities and incentives under social protection systems such as pensions, and discounts for all modes of transportation, healthcare facilities and other services.

C. Ending geographical disparities

Development in Assam has been uneven in the past and several geographical and spatial disparities in development persist. Here we focus attention on the main sources of such disparities: variation in inter-district development; the problems of the hill districts; special problems of char areas and border areas. Interventions required to end these disparities is discussed in turn.

I **Ensuring more geographically balanced development in the state.** As Figure 4.1 shows, significant disparities exist in the per-capita district GDPs indicating differences in levels of living. The three districts of Kamrup (Metropolitan), Jorhat and Sibsagar stand out from the rest quite significantly. A Lorenz curve computed from this data yields a Gini inequality coefficient of 0.16. In line with the objective in Assam 2030 of lowering inequality in all possible dimensions, spatial inequality of this nature needs to be reduced too.

Figure 4.1 : Annual Per Capita incomes of districts

Source: Assam Human Development Report 2014

a. *Reduce inter-district disparity.* To do so, the Government will closely monitor the inter-district disparities over the coming years and allocate more resources and effort to the lagging districts to reach a more balanced development in the state. The target is set to bring down this Gini co-efficient significantly over the years to 2030.

ii. **Removing development constraints faced by the hill districts.** Owing to locational disadvantages and remoteness, the hill districts of Assam face certain specific constraints to their development. Table 4.3 below illustrates this. Several social indicators are seen to be poorer than the state average, particularly in Dima Hasao district. Basic infrastructure attainments relating to access to water and availability of roads is also a problem. The Government will address these constraints to ensure that populations living in the hill areas do not fall behind in any way. In particular, the Government will focus on:

a. *Removing basic infrastructural constraints.* As communities in the hills face the major constraint of access to roads, the Government will pay special attention to connecting hill communities with provision of all-weather roads so that they can access education and health centers and have easy access to markets for their produce. Progress in removing other basic infrastructural constraints such as lack of access to clean water will be monitored carefully with a view to bringing attainments in line with the state's overall targets by 2030.

b. *Removing social deprivations in the hills.* Likewise, the Government will carefully monitor the social indicators in the hill districts to ensure that the populations in the hill districts also attain the social targets set for the state as a whole by 2030.

c. *Ensuring environment friendly growth in the hills.* The hills with their forests, abundant streams and other natural resources have a fragile eco-system which can be adversely affected by unsustainable urbanization and growth. The Government will therefore pay particular attention to ensuring that there is no environmental damage as a result of the development process and that natural resources and systems including forests, streams, water bodies are sustainably managed and all environment related SDGs are also achieved in the hills.

Table 4.3. Selected socio-economic indicators of hill districts

Indicators	Karbi Anglong*	Dima Hasao	Assam
Poverty head count ratio (HDR 2014)	39 (2014)	45 (2014)	27.34** (2016-17)
Nutrition deficiency (stunting) (HDR)	51 (2014)	74 (2014)	54 (2014)
Net enrolment ratio at upper primary (%) – UDISE	64.5 (2015-16)	59.7 (2015-16)	67.5 (2015-16)
Drop out at lower primary level (%)- UDISE	22.3 (2015-16)	27.7 (2015-16)	15.4 (2015-16)
Drop out at upper primary level (%)- UDISE	10.8 (2015-16)	14.8 (2015-16)	10.5 (2015-16)
% of HH with improved drinking water facilities –NFHS-4	52.4 (2015-16)	47.7 (2015-16)	83.8 (2015-16)
Surfaced roads (kms per '00 sq km of geographical area)	42.85 (2015-16)	41.92 (2015-16)	62.12 (2015-16)

Notes: Figures in parenthesis indicate year of data

*Data pertaining to West Karbi Anglong district included in the Karbi Anglong district.

**Department SPAP Panchayat and Rural Development

iii. **Addressing the special problems of *char* and border areas.** Assam's *chars* (Brahmaputra riverine areas) and border areas have special problems and constraints of their own. The *chars* covering about 3.6 lakh hectares of land (4.6 percent of total land area of the state) provide livelihoods to a population of about 2.5 million (8.0 percent of total population). It has been estimated that nearly 80 percent of the population in the char areas live in extreme poverty.[27] The chars face problems of perennial flooding, erosion, lack of connectivity and extreme inadequacy of basic infrastructure.

Similarly, Assam's border areas are cut off from the mainstream of development owing to their remoteness and also face acute lack of connectivity. Very little is known about the socio-economic conditions of populations living in both *char* and border areas except subjective assessments made by Government officials attempting to bring basic services to these areas – all indicating a general state of deprivation. Populations in char and border areas face significant risk of being left behind unless remedial measures are taken.

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[27] Figures cited relating to char areas are from Government of Assam Draft Twelfth Five Year Plan (2012-2017) document Chapter M-1 on Char areas.

The Government is determined to ensure that no one in these areas is left behind. In pursuit of this objective, the following actions will be taken:

a. *Socio-economic surveys conducted and development strategiesprepared.* Surveys for these areas will be conducted by June 2018 and a special strategy and action plan suited to the need of char and border area people, crafted by December 2018 for their continued and accelerated development. The surveys will, among others, yield baselines for SDG indicators and a system for updating such data in order to enable regular monitoring of the progress of these areas on core SDG indicators will be part of the development strategy for these areas.

b. *Ensuring continued improvement of socio-economic attainments of people in these areas* willbe actively pursued so that they reach the SDG targets by 2030. The Government allocate resources and efforts to ensure that this objective is reached.

4. Technological change and innovation

Technological change and innovation will be pursued vigorously by the Government in its effort to ensure that deprivations are removed from the state by 2030. As many deprived communities live in difficult to reach pockets innovative ways will be found to reach them to provide services at the last mile. These include virtual teaching; tele-medicine and mobile clinics; low cost and innovative housing; off-grid provision of electricity using solar power; innovative methods to protect the environment; more extensive coverage with Aadhar cards for better access to services; digital and GPS technology to curb crime etc.

Organizational and institutional innovations to provide appropriately designed services to service the specific needs of the deprived populations will also be necessary and will be actively encouraged among the bureaucracy and service providers rather than a "one size fits all" approach.

5. Partnership and networking

Partnerships at multi-levels will be essential to achieve SDG 5 and 10. The Government will ensure, first, that there is close coordination between departments —several of which are involved in attaining these Goals— to achieve the outcomes of these SDGs. It will therefore be ensured that Department of Social Welfare (which is the nodal Department) works closely and seamlessly with the Home Department, Department of Education, Department of Labour, and the Department of Skill, Employment and Entrepreneurship, Welfare of Plain Tribes and other Backward Classes, Tea Tribe Development Department, Minorities Development Department among others.

The Government will also network with multilateral agencies such as UN Women, UNICEF, UNDP, WHO etc; state agencies such Assam State Commission for Women and others along with non-governmental and civil society organizations working in the areas supporting SDG 5 and 10.
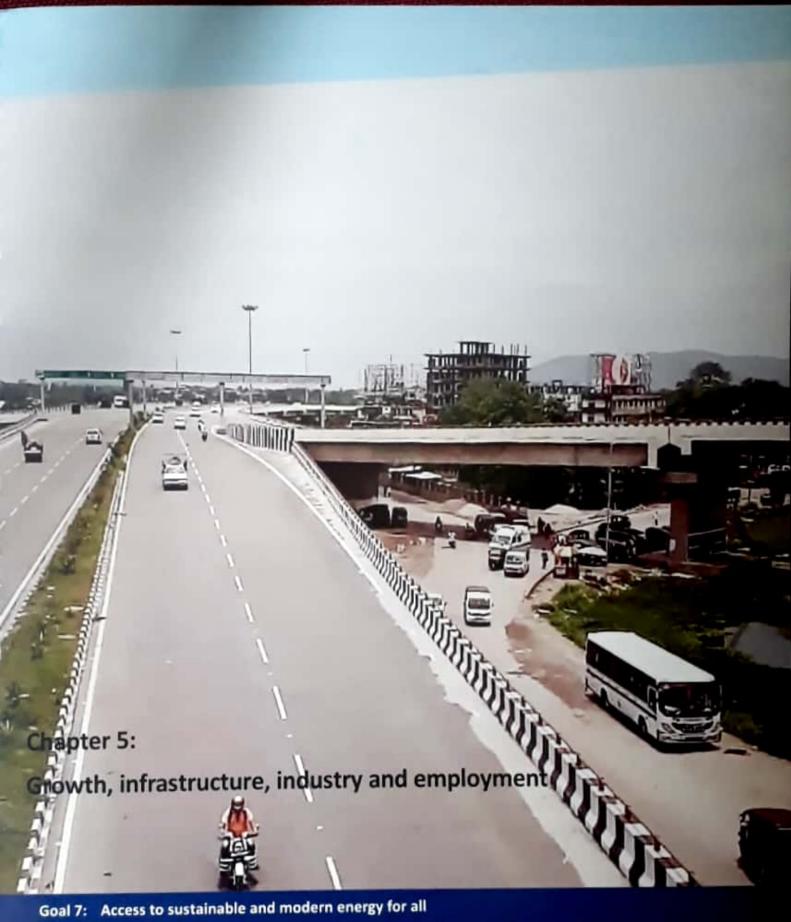
Partnerships with communities and the private sector will also be key as in the case of private sector support for TGL community highlighted as essential in this chapter earlier. Reorienting public policies and creating enabling environment for private entrepreneurship through equalization of opportunities which in turn raises health and education levels at the bottom of the pyramid. Reducing income inequalities, providing economic opportunities, investing in human capital will assist in removing inequalities amongst all.

6.   **Resource requirements**

i.   **Financial resources.** The departments which aremost involved in delivering the outcomes described in this chapter have calculated gaps in funding based on the principle of back-casting. Their assessment is presented in Appendix 9.1 of Chapter 9.

ii.   **Human resources.** Adequatehuman resources, both in terms of number and capacity will be required for the large scaling up of public effort needed to ensure that no one is left behind. The Government in the concerned departments will undertake a human resources and capacity building strategy by June 2018 for this purpose.

1.   **Coordination arrangements for Goals 5 and 10**

Goals	Lead Department	Secondary Department		Cross Cutting Departments
Goal 5 Gender Equality	Social Welfare	Education	Home, Revenue & Disaster Management,	Social Welfare (Gender), WPT & BC, Tea Tribes Welfare, Minority Development, Char Areas, Hill Areas, Science & Technology, Information Technology, Information & Publicity. Transformation and Development and Finance Department (Oversight)
Goal 10 Reduced Inequalities	Planning & Development WPT &BC (deprived groups and areas)	Social Welfare, Finance (Financial Inclusion), Revenue,Tea Tribes Welfare, Minority Development, Char Areas, Hill Areas		

Chapter 5:

Growth, infrastructure, industry and employment

Goal 7: Access to sustainable and modern energy for all

Goal8: Promote inclusive and sustainable economic growth and decent and productive employment for all

Goal 9: Build resilient infrastructure; promote inclusive and sustainable industrialization and foster innovation

Chapter 5:

Growth, infrastructure, industry and employment

Goal 7: Access to sustainable and modern energy for all

Goal8: Promote inclusive and sustainable economic growth and decent and productive employment for all

Goal 9: Build resilient infrastructure; promote inclusive and sustainable industrialization and foster innovation

1. Introduction.

Broad based, inclusive and sustained economic growth that provides employment and raises incomes of all households significantly, including particularly that of the poorer income groups, has been universally acknowledged as the primary instrument for reducing poverty everywhere. Economic growth to be broad based must involve all productive sectors – agriculture, industry and services. Rural and agricultural growth has been discussed in depth in Chapter 1. Here the focus is on industry and employment. One of the key ingredients of growth is infrastructure development. This chapter therefore discusses in particular energy and road infrastructure. As these three goals are closely related to each other with strong synergies, they are placed together under one chapter.

2. Goals and targets

Economic Growth. The Government envisions bridging the gap in per capita income between Assam and other states by accelerating the state's pace of economic growth. At present, for example, Goa has four times higher per capita income than Assam. In order to catch up, a target growth rate of GSDP to reach at least to 10% per annum by 2025-26 is envisaged. The current annual rate of growth of Assam's GSDP (constant prices) at 7.88% exceeds the national GDP growth rate of 7.3% (2014-15). To achieve the target of 10% by 2025-26, however, continuous effort will be required. Given the trend rate of improvement from the recent past this appears quite feasible as can be observed from Figure 1.

Unemployment. Achieving full and decent employment is another key objective under Goal 8. The relevant indicator to measure this is the total unemployment rate at usual status (ps). According to the Fifth Survey of Employment and Unemployment conducted by Ministry of Labour in 2015-16, this unemployment rate stood at 61 per 1000 population (age 15 and above) against the national figure of 50 per 1000 population. The target adopted is to reduce this unemployment rate by two-thirds, i.e., to 20 per 1000 population by 2030. As some states in India (such as Maharashtra, Chhattisgarh, Karnataka and Gujarat) have achieved such levels this targeted rate of unemployment although challenging is feasible.

Industry and manufacturing. The share of manufacturing sector in GSDP (at 2011-12 constant prices) in 2015-16 stood at 9% against the national average of 16.05 %. The share of manufacturing sector employment in total employment was very low standing at only 4.8% against the national average of 10.5% which itself is insufficient. As industrial employment offers avenues for higher incomes to the state's population which currently is still engaged predominantly on low productive primary sector activities, Assam 2030 proposes to increase the share of manufacturing in the gross state domestic product by double of the present level by 2030 through promotion of sustainable industrialization in the state. A corresponding tripling of the share of manufacturing sector employment is also necessary. These goals are well within the grasp of the State which is making efforts to reduce the current over-dependency on the primary sector and strengthening of manufacturing growth and employment along with the "Make in India" and expansion of manufacturing skills initiatives of the country.

Infrastructure - Energy. The proportion of households using electricity as the primary source of lighting was only 37.0% in 2011 and much below the national figure of 67.2%. Since 2011, however, because of new programmes the figure has risen to 54% currently. Assam: 2030 envisages raising this proportion to 100% by 2030. The Government of India has however, moved this target forward for the country as a whole to 2019 which will now have to be achieved by Assam too requiring a considerable acceleration of efforts compared to the past.

In addition, energy has to be generated increasingly from renewable sources. Assam produced only 2.5% of electricity in January 2016 from renewable sources (solar, photovoltaic, small hydro up to 25 MW, wind, biomass, and waste to energy etc.). Assam: 2030 aims at raising the proportion of renewable energy in the total energy production to 40% by 2030 (in keeping with the national commitment at the Oct 2015 Paris Climate Change Agreement). Sustainable energy production also requires elimination of waste. Transmission and distribution losses stood at a staggering 21% in 2014-15. This loss is targeted to be reduced to 5% by 2030.

Roads and other infrastructure. The length of surfaced road (NH, SH and PWD) per 100 sq. km area and proportion such roads per 100,000 population stood at 35.4 km and 89.0 km in 2015 respectively. While the area density was comparable to the all-India average in 2015, the

population density was about 10% lower. The Government of Assam in accordance with Assam: 2030 will seek to ensure adequate land capacity, riding comfort and scientific asset management system besides all- weather connectivity to all habitations by 2030.

Apart from roads, improved communications through telephones is essential for growth. Currently, a little over half of the population has access to either a mobile or fixed line telephone (as compared to nearly 80% for India as a whole). The target is to reach universal (100%) connectivity by 2030. Given past trends, this target should not be difficult to achieve.

Table 5.1: Major indicators on growth, employment, industry and infrastructure

Indicators	Baseline (Latest Year)	Target 2019-20	Target 2023-24	Target (2030)
Growth and employment				
Annual Rate of Growth of SGDP (constant prices) (%)	7.88 (2014-15)	8.66	9.62	10
Total Unemployment Rate usual status (ps) (per 1000 population)	61 (2015-16)	50	30	20
Seat Capacity in Govt. ITIs	8,484 (2016-17)	11,044	22,000	43,000
Seat Capacity in Pvt. ITIs (under SCVT)	5,338 (2016-17)	6,598	24,000	50,000
Dropout rate from Government ITIs (%)	14.67 (2016-17)	10.00	5.00	2.00
Learning outcomes based on ITI assessments (placement/self-employment) entrepreneurship development	90.00% (2016-17)	98.00%	100%	100%
Number of live registered candidates in employment exchanges (lakhs)	19.0 (2016-17)	13.9	9.1	5.4
Number of child laborers identified (lakhs)	3.45 (2016-17)	2.62	0.59	0.00

Indicators	Baseline (Latest Year)	Target 2019-20	Target 2023-24	Target (2030)
Industry				
Share of manufacturing sector in GSDP (at 2011-12 constant prices, %)	10.6 (2015-16)	12.28	20.12	Triple over baseline
Share of manufacturing sector employment in total secondary employment (%)	11.0 (2014-15)	21	30.0	Triple over baseline
Growth rate industry sector (constant prices) (%)	2.28 (2014-15)	5.46	10	10.0
Growth rate of GSDP at constant prices of Manufacturing Sector	2.83 (2014-15)	6.07	10.0	10.0
Land bank developed (cumulative in acres)	3352.19 (2014-15)	5276.2	10,086.2	
Infrastructure				
Proportion of households using electricity as the primary source of lighting (%)	37.0 (2011)	100.0	100.0	100
Proportion of renewable energy to total annual energy production by installed capacity (%)	2.08 (2016)	54.7*	27.3	31.01
Total power generating capacity (conventional + renewable) in MW	609.9	865.4	2949.4	3104.9
Aggregate technical and commercial (AT&C) lossesto total energy produced (%)	23.0 (2016)	17.0	15.0	8.0
Total length of surfaced road (NH, SH and PWD) per 100 sq. km area	35.42 (2015)	45	61.05	81.59
Total length of surfaced roads (NH SH & PWD) per 100,000 population	89.03 (2015)	111	182.23	205.33
Total (wireless wireline) telephone connections (per 100 population)	53.95 (2015)	60	80	100

*This high percentage is due to very high-power generation through renewable sources proposed during this period.

The major indicators that will need to be closely monitored in this area is set out with baselines, 2030 targets and intermediate targets in Table 5.1 above.

3.   Major strategic interventions proposed

A.   Accelerating economic growth

To speed up Assam's economic growth, growth of all productive sectors must simultaneously increase – agriculture, industry and services. Recent growth performance compared to previous performance in the 2004-12 period overall and in these three sectors is shown in Table 5.2 below.

Table 5.2: Growth of State GSDP and principal sectors earlier performance and recent experience

Period	Agriculture & allied	Industry	Services	GSDP
2004-05 to 2011-12	4.08	2.67	8.68	6.05
2014-15 to 2015-16	2.21	7.37	10.34	7.81

Source: Assam Twelfth Five Year Plan 2012-2017 and Economic Survey 2016-17

As evident from above, the services sector which contributes nearly half (46.7% in 2015-16) to the state's GSDP is also the fastest growing sector in the state's economy. The industry sector contributes 28.82% and has in recent years picked up momentum but still insufficiently and its contribution to the state's GSDP has remained stagnant. The agriculture and allied sector's contribution to the state GSDP stood at 18.7% in 2015-16 and has been declining. Unless the industry sector is able to expand sufficiently –and particularly the manufacturing segment– It will be unable to provide productive employment to those migrating from the relatively low productive agriculture sector which has been growing the slowest.

Therefore, while agricultural growth will have to be pursued vigorously to improve the lot of households in the rural sector, particularly the poor for whom the agriculture provides the principal means of sustenance, rapid growth of the industries sector and particularly the manufacturing component must be at the heart of the future growth strategy for Assam. Growth of infrastructure –particularly power and roads– is critical for the growth of the state economy in general and industries. Both objectives will also need to be pursued both with inclusion and environmental sustainability in mind as will be discussed in the interventions below.

B. Promoting inclusive and sustainable Industrialization

Seven major strategic priorities have been identified to spur inclusive and sustainable industrialization in Assam. These involve several departments and good coordination amongst them is essential. These are discussed in turn below.

i. **Entrepreneurship development.** One of the severest bottlenecks to industrialization in the state is lack of entrepreneurship. This is proposed to be tackled by:

a. *Adopting entrepreneurship motivation campaign* to change the prevailing Government job-oriented mindset to an entrepreneurshipone from school level, involving community institutions, NGOs, Panchayati Raj Institutions (PRIs) etc. in this effort. It will also require introduction of business studies in college curriculums. Appropriate actions must begin immediately in consultation with the Education, and P&RD departments and encouraging NGOs to support this effort.

b. *Focused entrepreneurship development programs* adopted and expanded in specific trades with growth potential such as hotels and other services for tourism; media related services; start-upinitiatives; food processing; IT enabled services etc. Entrepreneurship development and training support to enable youth to start and run enterprises in products based on local resources such as water hyacinths, bamboo, natural dyes, candle making, waste management, organic vermicomposting etc. should be also initiated. Special attention must be paid to promoting entrepreneurship amongst women and disadvantaged groups such as scheduled castes and tribes; persons with disability among others.

c. *Promotion of rural entrepreneurship* will be accelerated through special assistance under the *Boneej* scheme. Also, credit linkage provided through the *Sarothi* interest subvention scheme. In addition, direct facilitation and promotion of agri-business projects and setting up of primary processing centers (PPC) at village/ cluster level for agriculture based products will be undertaken.

d. *Mega events/business summits* to bring more investment in the State will be organized periodically beginning with one before March 2018.

e. *A world class business center* of international standard will be established in Guwahati to promote business and to facilitate investors from outside the state and even from abroad and to take advantage of the Central Government's Act East Policy. Work on this will begin in 2018-19.

ii. **Infrastructure for industries.** The industry sector is constrained severely by lack of adequate infrastructure. While basic infrastructure for the state's development will be promoted

in general and will be discussed in detail in Section C, here we focus on industry specific infrastructure. The main interventions proposed are as follows.

a. *Growth corridors* are to be set up along existing as well as new highways. All required facilities would be provided to industrial complexes such as land, adequate and quality power, water, broadband connectivity, waste management etc. Low lying land could be filled using soil dredged from Brahmaputra and Barak dredging operations that are proposed to begin in 2017. Suitable unused forest, PGR and VGR land could also be located for this purpose. A thorough assessment of availability and supply of key inputs such as land, water, power and ICT for industry will be initiated immediately by the industries department and completed by March 2018. The total landbank available with the Government was 3,352 acres in 2014-15. It is proposed to create an additional landbank of 6734 acres by March 2024.

b. *Upgraded infrastructure* will be provided to all industrial centers comprising growth centers, industrial estates and parks (including sector specific industrial parks such as for bamboo, plastic, food processing), integrated industrial development contestant present there are 20 industrial estates, 8 mini industrial estates, 17 industrial areas, 12 growth centers, one export promotion industrial park (at Amingaon), 11 industrial infrastructure development centers (one each in 11 districts), 3 industrial growth centers, and 2 food parks. Upgraded infrastructure will be made available by March 2020 to all existing and new industrial centers under construction and planned.

c. *Development of export infrastructure* for encouragement of export of industrial goods would be an important focus. An export promotion industrial park exists and others may be considered. The decision of setting up a Multi-Modal Logistic Hub in Guwahati taken in May 2017 needs to be speedily implemented as it will promote trade and commerce and bring Assam at the center of India South East Asia interface in support of the Act East Policy.

d. *Private sector developers* would be actively encouraged and suitable incentives provided to support establishing industrial infrastructure and in managing industry centers and parks.

e. *A core group* consisting of representatives of industry, and infrastructure sectors would be set up immediately to make specific recommendations by March 2018 regarding establishment of growth corridors and industrial parks and clusters; upgradation of infrastructure for industries for them; and policies necessary including policies to encourage private sector participation for industrial infrastructure.

III. **Inclusive industry – focus on micro, small and medium enterprises (MSMEs).** Assam's focus on inclusive industrialization rests primarily on promoting the micro, small and medium enterprises(MSME) sector which has the potential to provide large scale employment. At present such enterprises provided employment to about 2.5 lakh persons through over 43,000 enterprises. It is proposed to expand this to 6.0 lakh employed in 1.0 lakh enterprises by 2030. The main interventions proposed to reach this target are:

a. *Infrastructure provision.* It is proposed to set up at least 5 MSME parks by 2019. In addition, support to rural MSMEs will be provided by establishing primary processing and industries centers at block and district level to specialize in locally available raw materials and resources such as agribusiness and traditional industries; which must be developed as centers of excellence.

b. *Marketing support.* Besides managing the ManiramDewan Trade Centre, Guwahati, the Assam Trade Promotion Organization (ATPO) will be involved in Export Promotion through participation in Trade fairs etc. Marketing support will also be provided by developing marketing infrastructure/ outlets in prime locations; online marketing; supporting exposure visits and participation of MSMEs in exhibitions and fairs/melasin India and abroad including through the new *Biponi* scheme; encouraging procurement of MSME products by state and Central government entities and defense and paramilitary agencies; facilitation for branding of products etc.

c. *Expanding credit for MSMEs.* The credit deposit (CD) ratio is the state is around 41% at present compared to nearly 74% for India. It is targeted to expand the CD ratio to 70% by 2024 with specific attention to credit for the MSME sector. The Industries Department will help MSME enterprises to obtain credit and encourage banks and financial institutions to simplify the process for them.

d. *Other facilitation measures.* These include relaxation of taxes for first generation entrepreneurs in the initial period to overcome teething problems; minimizing documentation for establishing enterprises and availing incentives; simplifying procedures for conversion of land for MSMEs; promoting social recognition of MSME entrepreneurs through awards etc. Focused facilitation of enterprises where local potential is strong will also be an important priority. This includes enterprises such as handicrafts and handlooms, food processing, products from bamboo and water hyacinths; sugar cane industry and tea growing. Special attention will be provided to support women MSME entrepreneurs and entrepreneurs from deprived groups such as SCs/STs etc.

iv. **Promoting specific industries with growth potential.** Assam's natural resources give it comparative advantage in several specific industry areas which will be provided special facilitation. The development of handlooms and handicrafts, sericulture and agro-based industries have been discussed in detail under the discussion on promoting rural industries in Chapter 1. Here the following other specific industry sectors with potential are discussed.

  a. *Tea.* Assam tea has a significant share in the world tea market and contributes about half of the total tea production in India. However, its average yield is lower than the Indian average and efforts to increase this are necessary. A specific segment consists of small growers who are first generation young and educated entrepreneurs contributing about a third of Assam's tea production. Encouragement for the industry in general and the small producers will be provided. Construction of infrastructure for a Tea Park will begin in 2017.

  b. *Rubber.* Assam's agro-climatic conditions make it congenial for rubber production. In 2015-16 about 56,000 hectares was under rubber cultivation. The Rubber Board had targeted expanding this to 200,000 hectares by March 2018 which is unlikely to be met but will be realized as early as possible. Given the potential there is scope for setting up rubber based enterprises in the state.

  c. *Sugar.* Although there are a growing number of sugarcane growers in the state, and growth potential due to cultivation of high yielding varieties of sugarcane exists, lack of sugar mills acts as a constraint. Encouragement to private entrepreneurs to set up sugar mills will be provided after feasibility assessment studies are conducted by December 2018.

  d. *Bamboo.* Bamboo grows abundantly in Assam and products from it therefore can give Assam a natural advantage. To promote bamboo based industries, a bamboo park (at Chaygaon) is under construction. Amongst other facilitation measures, a diagnostic study on bamboo value chain with UNIDO expertise is planned in 2017-18 and to be completed by 2018-19.

  e. *Mineral based industries.* Given Assam's resources of petroleum, limestone, coal, siliminate and china clay, industries based on these minerals amongst others has growth potential in the state and will be facilitated.

  f. *Plastics.* Assam has significant potential to develop downstream industries from the Assam Gas Cracker Project completed in 2016. Amongst other facilitation measures a Plastic Park is proposed in Tinsukia district.

g. *Tourism.* Assam has immense untapped tourism potential based on its rich and diverse flora and fauna, natural beauty, holy shrines, ethnic diversity and vibrant culture and festivals. Yet, although more than 8.0 million foreign tourists arrived in India in 2015-16, only 26,000 visited Assam. During 2016-17, only 13,419 foreign tourists visited Assam. Tourism infrastructure, upgradation of facilities in parks and wild life sanctuaries, destination management, promotion of brand identity, media outreach have to be undertaken to promote tourism. The Tourism Department has taken initiative to develop the Tourist Resorts/Lodges in various places i.e. Tinsukia, Chandrapur, Kamrup (M), Amingaon, Sonitpur, Garmur, Majuli, Dibrugarh and other places also. Beside this, the Assam Tourism Development Corporation, the Nodal Agency of Tourism Department has also taken steps for upgradation of some existing Tourist Lodges which will also increase the employment opportunity of the local youths in Assam.

Keeping in mind the newly approved Tourism Policy of Assam, 2017, Assam Tourism Development Corporation has decided to develop various schemes. Promotion of tourism is one of the most important missions of the Tourism Policy of Assam, 2017. To attract the National and International Tourists, a global brand 'Awesome Assam' was created. Priyanka Chopra, noted Bollywood and Hollywood actor has been roped in as the Tourism Ambassador of Assam, which is expected to boost national and international tourism arrivals.

v. **Knowledge, technology and innovation.** Industrialization in Assam must be supported with knowledge of new products and processes and innovative methods based on research findings and incubation. Technology interventions to develop traditional industries like food processing, brass and bell metal, jute and water hyacinth products, bamboo, Assamese jewelry etc. are needed. The following interventions are important for initiating startup ventures.

a. Setting up of incubation/ knowledge center in academic and leading research institutions in the state such as IIT Guwahati; Gauhati University; Assam Agricultural University etc. For this purpose, a startup policy must be adopted like other states such as Karnataka which has established a startup policy with a timeframe of five years from 2015-2020. The policy entails setting up incubators in postgraduate colleges, collaboration between Research &Development (R&D) institutions and industry, and technical business incubators in higher learning institutions. Similarly, Tamil Nadu has set up a state-level warehouse at Tidel Park in its mission to set aside dedicated areas for startups to function.

b. Availing of the "Startup India: Standup India" initiative. Assam will avail of this Central Government initiative which provides support to women and SC/ST greenfield

entrepreneurs in the non-farm sector. The Start Up India scheme provides financial support through banks who are refinanced through SIDBI and guaranteed through the NCGTC; while the Stand-Up India scheme provides for handholding support for borrowers both at the pre-loan stage and during operations. This would include increasing their familiarity with factoring services, registration with online platforms and e-market places as well as sessions on best practices and problem solving. The Government intends to hold workshops in all districts for encouraging new startups under this scheme.

c. Technological innovations for sustainable and efficient industrial production. The Government will also actively partner with knowledge and technology institutions within and outside the state to encourage adoption of efficient and sustainable industrial technology and practices.

vi. **Policy, institutional and organizational changes.** Major changes that will be initiated include the following.

a. *Ease of Doing Business.* Assam has slipped two places in the interstate rankings under "Ease of Doing Business" between 2015 when it ranked 22nd out of 36 states and UTs to 24th rank in 2016.The department will review all policies and institutions to ensure that Assam moves up the rankings to be among the top 5 states by 2024.

b. *The Industrial Policy* of the state will be reviewed by March 2018 to reflect the major needs and requirements for the rapid industrialization of the state. This policy revision will include all above issues and interventions identified and changes to encourage startups and incubations as well as promotion of rapid, inclusive and sustainable industrialization of the state.

c. *Organizational changes for better coordination.* To coordinate activities of all departments concerned with industrial development (such as infrastructure departments, labor and employment, skills development, handloom and textiles, industry sectors outside industry department purview etc.) a high-level Committee under the Chairmanship of Departmental Ministers is to be constituted within 2017.

d. *A review of functions of PSUs and agencies under industries department* will also be undertaken in 2017. This includes reviewing the functions of AIDC, AIIDC, ASIDC, the construction wing under Commissioner of Industries & Commerce, and DI&CCs and the Industries department itself. The review will properly demarcate responsibilities and avoid overlaps and enable efficient coordination.

C. Promoting full and decent employment

Assam's unemployment rates are higher than the national average. To bring about the vision of Assam 2030 of full employment of those able and seeking work, a rapid increase in the state's economic growth is projected along with growth in agriculture, industry and services. Industry, particularly manufacturing, has potential to create many productive and better paying jobs and has been discussed in Section B above. Rural development and rural employment generation has been discussed earlier in Chapter 1. While growth and employment generation programs will create demand for jobs, supply could be constrained due to lack of skilled labor; or failure to search and find jobs to match jobs available with supply of skilled labor. Also, the state's regulatory authority will be geared up to ensure an environment of decent work for all in the state. These three aspects are discussed in turn.

I. **Skills development.** For youth in Assam to be better skilled, it is of prime importance that quality basic education is provided to all children and youth. The skill development of youth will also be provided through the vocational, higher and technical education programmes of the education departments which are discussed in detail in Chapter 4. Here we discuss the focused skills development programmes outside the education department provided through the state's ITIs and private sector vocational training institutes. All skills development initiatives will be placed under the Assam Skills Development Mission. The major interventions proposed to strengthen skills are discussed below.

   a. *Expansion of ITIs' capacity and quality.* The seats in the state's ITIs will be expanded 5 times from about 8,500 now to 43,000 in 2030. It is proposed also that private ITIs will expand seats 10 times from a little over 5000 to 50,000. At the same time, the quality of training provided will be enhanced with drop-out rates eliminated and full placement achieved by 2030 (Table 5.1). For this to happen, first, adequate qualified teachers and instructors will be provided according to norms and based on needs. Training of trainers on new trades and skills including exposure training will be undertaken. Experts will be hired. Second, the curriculums will be made flexible and need based and geared to the current and future needs of the state and country. Industry linkages will be strengthened specific new trades introduced for tying up with industries according to their requirements. Skill building will also emphasize self- employment and entrepreneurship. Skills will also consider needs of employers in rest of India as well as abroad. Third, a major scaling of infrastructure in terms of classrooms, libraries, workshops and hostels will be undertaken.

   b. *Expansion of apprenticeship program.* The state's apprenticeship scheme will be strengthened and larger number of public and private sector establishments will be

encouraged to provide on the job training. The state will also encourage establishments and potential apprentices to actively participate in the National Apprenticeship Training Scheme (NATS) supported by the Central Government.

c. *Expansion of private sector skills training programs.* A ten-fold expansion of seats in private ITIs is envisaged. This will require active encouragement of the private sector to set up in skills training in trades and crafts. Facilitation and incentives will be needed and will be addressed. The private sector will also be encouraged to scale up manifold the number of apprentices provided training in Assam.

d. *Special attention on needs of women and less privileged groups.* The female labour force participation rate is far lower than the male participation rate in Assam. To encourage greater participation of women, special efforts will be made to provide skills development to women. Similarly, special efforts will be made to impart skills to the less privileged groups in society such as SC/ST etc.

e. *Organizational changes.* Several departments are involved in critical aspects of skills development in the state. This includes the education departments involved with vocational education and higher and technical education; the labour and employment departments which support ITIs in the public and private sectors; the industries department which is involved with entrepreneurship development and industrial apprentices; the rural development department which facilitates the National Rural Livelihood Mission, the Assam State Rural Livelihood Mission, and the Rural Self Employment Training Institutes to be set up in each district supported by the Central Government. To coordinate all these activities being undertaken, the Assam Skills Development Mission has been set up which will bring all activities under a single umbrella and undertake coordination and facilitation. The Mission would also propose policy and institutional changes to drive the skills development program in the state.

ii. **Efficient job search and placements.** Job search, matching and speedy placements are also critical for expanding employment in the state. Strengthening the employment exchange network and improving their relevance and outreach is the focus. The current number of registered live applicants is 19 lakhs and through efficient exchange placements this is targeted to be reduced to 5.4 lakhs by 2030. The following interventions will be prioritized.

a. *Expanding access to services:* Major challenges lie in creating awareness among unemployed youth about vocational training as well as importance of registration in employment exchange to aspiring boys and girls above 14 years of age, in remote areas not covered by institutional facilities. The major challenges lie in creating skilled manpower for absorption in private and unorganized sectors, creating flexible service

rules, adopting new technology and innovation, flexibility in course curriculum, introduction of emerging trades and new avenues which diversify the linkages to industries. It also requires encouraging private sector towards skill building, tying up with ITI's to meet service requirements.

b. *Expanding network and coverage of employment exchanges.* All districts and subdivisions will have modern and upgraded employment exchanges with adequate space and modern technology by 2024. All physical infrastructure including IT will be provided. Full complement of trained staff and counsellors needed will also be made available by 2024. By then all employment exchanges will also be converted to Career Centres as per National Career Service (NCS) of Government of India.

c. *Augmenting and improving public service delivery.* These exchanges will be converted to nerve centres for jobs and career information by converting them to career centres. An updated knowledge repository on career related content for effective counselling and capacity building will be established in each. An efficient employment portal will be created of jobs available and registered job seekers with details of their skills and qualifications will be enabled to register and informed of jobs speedily. This will involve updating of data and systems for which consultants will be hired. Developing ITI's/ ITC / Institutes to impart employability skills.

d. *Developing strong career counselling outreach.* Employment Exchanges will reach out to schools and colleges to provide career and employment information and provide career counselling for students.

e. *Providing overseas employment opportunities.* In addition to providing local and national jobs information, exchanges will enter MoUs with overseas employers to provide information of overseas job opportunities promote legal migration overseas.

III. **Promoting decent employment.** The state government will strive to ensure decent work conditions in all establishments; safety and protection of women and vulnerable categories of workers; and abolition of child labour by 2030. Towards this aim, the following major interventions are envisaged.

a. *Enforcement of minimum wages.* By 2020, the Government has undertaken to ensure payment of notified minimum wages to all workers in the organised sector including plantations through strict implementation of the Minimum Wages Act, 1948.Disbursement of wages and salaries would also be made through bank accounts. For plantation workers, enforcement would be advanced to June 2018; and for shops and establishment workers to December 2019. Minimum wages would be enforced for domestic workers by December 2020.

b. *Ensuring equal pay for equal work for women.* By December 2020, equal payment of wages to men and women workers performing similar work will be ensured through strict implementation of the Equal Remuneration Act, 1976.

c. *Welfare of Tea Garden labourers.* The tea garden labour community remains ironically one of the most deprived communities in the state although many tea companies have made large profits from the industry. To ensure their welfare, the Government will, by March 2018, establish a web-based reporting and monitoring portal for submission and analysis of Form 12 of The Plantation Labour Act, 1951. This will help identify and address all issues pertaining to 7 lakhs plantation workers in Assam. The Government will also conduct a survey by December 2018 to identify all small tea growers in Assam and frame regulations to ensure minimum wages and decent work environments in all these gardens. Action will also be taken urgently (by December 2019), to define a mechanism for alternative self-employment for income generation and decent living of tea garden workers (including poultry farming, horticulture, dairy farming, animal husbandry, home-based tourism, tea tourism, etc.)

d. *Abolition of Child Labour.* It is estimated that in 2016-17 as many as 3.5 lakh children are employed as workers when they should be in school. The Government will ensure that there are no child workers by 2030. Among the more important measures that will be taken are first, to review and make more effective the State Convergent Plan of Action on Child Welfare in the perspective of the New Child Labour & Adolescent Labour (Prohibition & Regulation) Act 1986 by March 2018; second to complete a child and bonded labour survey by December 2018; third to adopt an area focused approach to make selected areas child labour free through concerted efforts by local governments and PRIs and other stakeholders – targeting by December 2019, all wards of Kamrup metro; and by December 2020, the 5 districts with highest child labour population will become Child Labour Free Zone. For this purpose, a massive awareness campaign will be launched involving also students, youth and state and local government functionaries and civil society. In cooperation with the Social Welfare Department and Axom Sarba Siksha Abhiyan Mission, homes for rescued child labours will be set up where they will be accommodated till age of maturity and provided education and vocational training.

e. *Protection of vulnerable workers.* In Assam two categories of workers have been considered especially vulnerable: migrant workers and domestic workers particularly women.

· In case of migrant workers, the Government will begin in 2017 with strengthening its system of inspections under the Inter State Migrant Workmen's Act, 1976 and by 2020, complete a state-wide survey to identify all potential hot spots for migrant workers.

By 2021, a data base of migrant workers will be set up and processes streamlined for movement of migrant workers from the home state to the host state. Better regulation of private placement agencies is critical and by December 2018 such regulations will be framed. Information regarding services available for welfare of migrants will be made widely available through websites and other media by 2018. To look after the interests of Assam's migrants to other states, positions of Labour Officers at Assam Bhawans and Assam's representative offices will be created who will be charged with providing help and counselling to migrants there.

- For welfare of domestic workers, minimum wages will be enforced by December 2020. Measures to regulate placement agencies for domestic workers will be taken by 2018. Partnerships with NGOs working for the welfare of domestic workers will be strengthened.

D. Access to Basic Infrastructure

Economic growth, including growth of industry, depends crucially on basic infrastructure, particularly energy and roads. Better access to such basic infrastructure is also essential for welfare of households and helps in learning, access to health and ability to seek better earning opportunities. Here we discuss access to energy and roads.

i. **Access to energy.** The main interventions envisaged to attain the vision of Assam 2030 in this regard comprise the following.

a. *Expansion of generation capacity and distribution network.* To ensure access of electricity to all households by 2019 as targeted, a major expansion in generating capacity from 376.70 MW in 2016 to over 2000 MW by 2023 is proposed. This is in addition to imported power that is expected to be available. Expansion of transmission network to handle peak power requirements of 4000 MW and ensuring 24x7 uninterrupted power supply by 2023 is also proposed. Micro-grids for servicing remote and difficult to reach locations (such as chars) will be considered. Capacity expansion is based on removing all bottlenecks in the existing generating stations; exploring new possibilities in conventional energy sources; and a major expansion of renewable energy. Private sector will also be actively encouraged to participate in generation both conventional and in renewables and necessary policy and regulatory changes for this purpose will be initiated by March 2018.

b. *Efficiency improvements.* A concerted effort to reduce transmission and distribution (T&D) losses as well as commercial losses will be initiated so that AT&C losses fall from 23% in 2016 to 15% by 2023 and 8% by 2030. Improvements in generating efficiency

will also be actively pursued. Capacities and skilled manpower for efficient maintenance of generation and transmission systems will be expanded.

c.   *Sustainable consumption and production of energy.*

·   Energy conservation measures will have to be strengthened. A large scale public awareness program for energy conservation, safety, and use of renewable energy as an alternate source of electricity etc. will be launched beginning 2017-18. Households and communities (including PRIs and municipalities) will be educated about ways of reducing energy demand such as by using LED lamps etc.

·   A major move towards renewable energy production will be made, focusing on solar energy and mini and micro hydroelectric plants which have immense potential in the state. Generation of electricity from wastes will also be actively explored. The proportion of renewables in the energy production mix will be increased from 2.08% in 2016 to over 27% by 2023-24. Private sector participation including by small entrepreneurs will be encouraged and a policy and regulatory environment created for this purpose. The functions of the state's two nodal agencies (APDCL & AEDA) for promotion of renewable energy sectors in the State will also be reviewed and strengthened.

ii.   **Access to roads.** To ensure access to all-weather roads by all citizens by 2030, the Government proposes to more than double the density of such roads per square KM; as well as their proportion to the population (Table 5.1). The major intervention areas to be focused upon are:

a. *Expansion of road network.* The total length of all-weather roads is projected to increase from about 29,000 KMs in 2016 to about 64,000 KMs in 2030. Major bottlenecks have to be overcome to achieve this expansion include delays in acquisition of land and procurement of forest based resources needed for roads; need for construction of a large number of culverts and bridges owing to topography of state; and procedural delays. These will have to be overcome.

b. *Maintenance and quality improvements.* Road maintenance in Assam with frequent floods and the perennial problem of overloading poses a challenge. Load restrictions will be more strictly enforced. More attention to maintenance will be provided in future and the Road Maintenance Policy of 2014 including creating adequate funds for maintenance will be reviewed with a view to further strengthening.

c. *Climate proofing.* The frequency and destructive impact of floods has been increasing due to climate change. This necessitates climate proofing of infrastructure, particularly roads and bridges. Raising above flood level heights and strengthening all roads in the

state network are a priority. New engineering technology will have to be employed in consultation with national and international experts.

d. *Safety.* Use of roads by a large number of pedestrians and cyclists in addition to cars, busses and commercial traffic pose serious safety hazards and leads to an unacceptably large number of road accidents. The National Road Safety Action Plan will be actively implemented.

e. *Adoption of new technology for construction and maintenance.* Rapid strides in new road technology is being made and Assam needs to adapt these consistent with its soil, climate and topographical features. For example, 3D printing technology to provide concrete sections of roads and bridges. The Assam Road Research and Training Institute will be strengthened and refurbished for better undertaking research on new and more appropriate roads technology and for capacity building of engineers and contractors by March 2018.

f. *Private sector participation.* The major road expansion program will require more active private sector participation. The Government is in the process of developing a PPP mode of road construction. This will be completed by March 2018.

g. *Policy changes.* Assam PWD Code (1942) and PWD Manual (1983) are outdated and are being revised. During the revision, all above issues will be addressed as appropriate. This process will be completed by March 2018.

2. **Technological Change and Innovation to Achieve Goals 7,8 and 9**

The potential for technological change and innovation in the industry and infrastructure sectors is immense and all efforts will be made to exploit them. The following areas will be especially explored:

· In industry, major potential exists in areas of research on developing new products using local resources; and in setting up incubation centres for enabling entrepreneurs to exploit such potential. The partnerships with local research and technology institutions of excellence must be tapped actively to generate such technology and innovations. Technical innovations are also necessary to be incorporated in all industrial establishments to ensure they produce in a sustainable fashion and eliminate waste, effluents and other pollutants.

· In the field of infrastructure, technological innovations in both energy production and road construction are large. In the former, more efficient generation from conventional sources are constantly developing which must be used. In case non-conventional and renewable energy sources, rapid advances in technology are taking place and the state will make attempts

to take advantage of them. In road construction, use of 3D printing is one among many technological innovations which will be explored.

3. **Partnerships.**

Attention to partnerships will be vital in the industry sector where Government merely plays a facilitating role in promoting development of industries which are mainly in the private sector. Close contact and cooperation with industry associations, public and private sector banks and financial institutions is essential and will be strengthened going forward.

Private sector participation is being envisaged as providing the bulk of the skills training in coming years. This will involve major facilitation effort to enable private institutes to grow and spread. Close partnerships with industry associations will also be necessary in developing skills so that skills relevant to industry are created.

Partnerships with community organizations, PRIs, and civil society will be fostered in all decent work areas to achieve cooperation with these organizations so that decent work objectives are achieved.

Although basic infrastructure is currently the preserve of the public sector, more private sector participation in both energy and roads will be essential in the future. The policy environment including fiscal and other incentives will be reviewed to strengthen future private sector participation including through the PPP mode.

4. **Resource requirements**
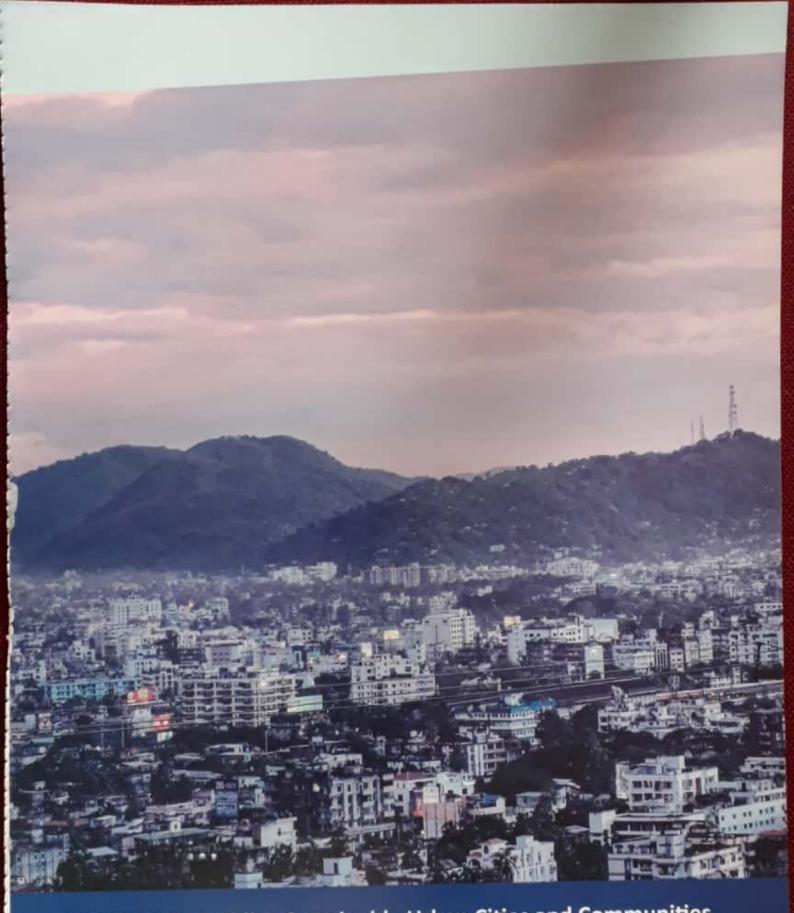
Human resources. The realization of Assam 2030 for Goals 7, 8 and 9 will require a very major scaling up of effort from current levels. More and better quality public services will be provided and done so more efficiently. Therefore, detailed human resource strategy is being be undertaken within each concerned department supporting these Goals focusing on (i) a thorough review of all positions as to their utility; (ii) filling up speedily critical vacancies; (iii) rationalization of existing personnel and redeployment if necessary; (iv) considering outsourcing if specialized private sector entities can provide services better; (v) working out a net requirement of additional critical staff. Such an exercise has to be completed by 31 March 2018.

Financial resources. The required expenditures based on the strategy developed to achieve Goals 7, 8 and 9 is shown in Appendix 1 of Chapter 9. Only expenditures of departments primarily connected with these Goals have been included to avoid double counting.

7.   Coordination arrangements for Goals 7, 8 and 9

Goals	Lead Department	Supporting Department		Cross Cutting Departments
Goal 7 Affordable & Clean Energy	Power	Science & Technology,		Social Welfare (Gender), WPT & BC, Tea Tribes Welfare, Minority Development, Char Areas, Hill Areas, Science & Technology, Information Technology, Information & Publicity, Transformation and Development, and Finance Departments (Oversight)
Goal 8 Decent work and economic growth	Labour & Employment	Industries & Commerce, Tourism, Education (Vocational Educ.), Social Welfare (ending child labour, trafficking etc.)	Cooperation, Handloom Textile & Sericulture, Transport	
Goal 9 Industry innovation and Infrastructure	Industries & Commerce, PWD (road infrastructure)	Skills Development, Labour & Employment	Power, Science & Technology	

CHAPTER 6. Building Sustainable Urban Cities and Communities

Goal 11: Self resilient, sustainable and safe cities

Chapter 6 : Building Sustainable Urban Cities and Communities

Goal 11: Self resilient, sustainable and safe cities

1. Introduction.
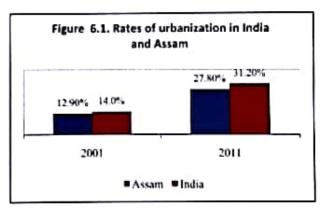
This chapter discusses the Sustainable Development Goals (SDGs) 11 which focuses on 'Making cities and human settlements inclusive, safe, resilient and sustainable.' Goal 11, highlights the need for adequate, safe and affordable housing and basic services for all and upgrading slums. It focuses on safe, affordable, accessible and sustainable transport systems, improved road safety especially for the most vulnerable including women, children, persons with disabilities and older persons. It stresses on the need to create sustainable urban environments with adequate space and planning, with capacity for participatory, integrated and sustainable human settlement planning and management.

2. Goals and targets

Under SDG 11 the main focus areas are on developing urban transport and roads, improving urban environment, providing housing for all, and most importantly creating effective governance systems. Assam is expected to follow the nation's footprints in terms of urbanization rate. Decadal population growth of Assam (16.9%)

Figure 6.1. Rates of urbanization in India and Assam

Source: census2011

is in sync with that of India (17.3%).Assam's economy is targeted to achieve a 10% growth rate by 2025-26 under Vision 2030.With the needs of a rapidly growing economy and population, the pressure on urban infrastructure will increase(see Appendix 6.1) requiring around Rs. 36000 crores to bridge the cost of development of infrastructure. The key areas which need to be monitored closely for achieving Goal 11 are water supply, sewerage and sanitation, solid waste management, storm water drainage, urban transport, urban housing, street lighting, master plan formulation and implementation, and enhancing capabilities of Urban Local Bodies (ULBs). These are set out in Table 6.1 with baselines and targets.

Table 6.1: Major indicators and targets for Goal 11

Indicators	Baseline 2016-17 (Current and future gap)	Target 2017-2020 Achievement	Target Achieved 2020-2024 (Cumulative)	Target Achieved 2030 (Cumulative)
Road network (km)	6384	23%	83%	100%
Total Length of Public Transport System (km)	1450	14%	41%	100%
Green Transport Corridors (km)	3500	40%	85%	100%
Dedicated cycle track (km)	1250	32%	81%	100%
Pedestrian friendly environments in towns and cities (km)	6000	42%	92%	100%
Traffic Management system (km)	6384	28%	98%	100%
No. of slum Households covered	5100	39%	89%	100%
No. of Tenable/untenable slums	70/233	42% / 43%	90% / 91%	100% / 100%
No, of EWS HHs sanctioned	26,467	100%	-	-
Urban housing (gap)	5,44,000 nos.	26%	59%	100%
Water Supply (gap)	429 MLD*	23%	46%	100%
Sewerage and Sanitation (gap)	600 MLD	35%	79%	100%
Solid Waste Management (gap)	1285 TPD**	12%	34%	100%
Storm Water Drainage (gap)	4578 km	22%	74%	100%
Urban Transport (gap)	1900 buses	16%	37%	100%
Street Lighting (gap)	155000 lights	32%	96%	100%
Mortality Ratio due to Accident(per 100,000)	34.4 (Baseline)	15.0	5.0	Negligible

Source: Departments' Strategy Papers and Action Plans (SPAPs), PWC report.

*Million litres per day

**Tonnes per day
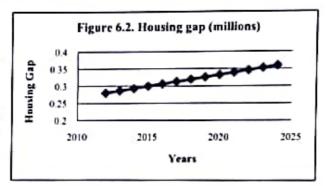
3. **Major issues, constraints, and interventions.**

i. **Develop safe, affordable and sustainable urban transport systems:** The Government will create adequate, safe, affordable and sustainable transport systems. It will expand public transport systems and connect urban and peri-urban areas with effective transportation systems which is vital for the proper economic development of the region. A transit oriented development approach with mobility integration services will be adopted. Some monitorable actions are:

a. Quality of urban transport services will be improved in a phased manner in all urban areas beginning 2018 and covering all areas by 2030 and will include measures such as (a) low floor, high quality urban bus services; quality mass rapid transit systems and quality passenger amenities and bus stops; (b) provision for physically challenged persons, elderly and pregnant women; (c) smart-cards for travel in public transport systems; (d) automated traffic signalling systems in all towns and cities; (e) adequate and safe street parking facilities; (f) creation of additional lanes for cycle tracks and walkways.

b. Management of transport services will be strengthened so that they can be provided efficiently, punctually and in a passenger friendly way. An annual passenger feedback system with monitorable quantitative scores for assessing public's perception of quality of services will be introduced in all urban areas in 2018 and improvements effected based on feedback received.

c. Regulation of existing informal mass transport systems and proposed new systems will strengthened by reviewing current regulations and their implementing mechanisms and introducing new strengthened regulations and implementing arrangements by 30 June 2018.

d. New services such as Metro systems for Guwahati will be introduced in a phased manner beginning in 2018.

e. With an emphasis on sustainability, alternative energy resources for transport systems, with CNG filling station/ rapid charging points and provisions for service kiosks should be developed by June 2018. A regulatory authority for managing battery operated green vehicle will also be created by 30 September 2018. By 2030, at least 50% of all public transport will move to EV. The State will develop an EV ecosystem.

ii. **Attain qualitative and quantitative improvement of roads.** The main challenges facing roads in Assam are inadequate planning, unsurfaced kutcha roads, poor quality and maintenance of roads, inconsistent width of roads, insufficient road network coverage and high numbers of serious accidents.

a. *Improved road and traffic planning.* Land use and transport planning will be integrated to facilitate smooth movement of traffic. The current gap in urban roads is estimated at around 2800 kms and 500 buses (as per the 7 years strategy plan). The Government will bridge the gap in road requirements including providing adequate road networks in urban

peripheries through proper planning of road networks and building of roads along with improvement of existing roads so that this gap is eliminated by 2024 and keep adding length of roads to maintain a zero gap thereafter.

b. *Road quality improvements.* Steps to ensure good road quality will be initiated. Adequate and uniform road width with drainage will be provided. Implementation of land pooling modalities will be developed to make provision for adequately wide roads and other needs. Provision will be made for pedestrian friendly environment with a barrier-free environment for every road which integrate parks and open spaces with pedestrian movement. All urban roads will be upgraded to these higher standards along with provision of such necessary ancillary requirements in phases by 2030.

c. *Ensuring road safety.* Strict implementation of rules and regulations will be initiated with immediate effect to ensure proper road safety. This will be coupled with adequate street lighting, proper road signage and proper colour coding systems for traffic regulation. Traffic accidents will be gradually reduced from the current high levels and brought to near negligible levels by 2030.

Figure 6.2. Housing gap (millions)

iii. **Provide Housing for All by 2030.** The current housing shortage in Assam's estimated at 3.13 lakh houses.[1] Through interpolation and extrapolation method the housing shortage for preparation of the 3-year Action Plan 2020 is projected to be around 3.32 lakhs and for the 7-year Strategy Plan the demand stands at approximately 3.59 lakhs. The trend in housing gap may be seen in Figure 6.2. In addition, there is an unprecedented proliferation of slums. With the rapid growth of urbanisation, large segments of the urban population are forced to live in substandard housing with uncertain property rights and limited access to basic services such as clean water, toilets, electricity and garbage collection. Moreover, the large influx of rural migrants to the urban centres in search of livelihood, shortage of affordable houses and high prices of land beyond the reach of the urban poor has contributed to the growth of slums in both public and private land. As per Census 2011, there are currently around 1.3 crore urban slum households who need affordable and quality housing. In view of these, the following interventions will be adopted to solve these problems. The Central Government has formulated a Housing for All programme under the Pradhan Mantri Awas Yojana (PMAY) the urban part of which (PMAY-U) has four main components which will be used by the state to achieve its own goal of housing for all. The State Government will after the initial phase till March 2022 review the pace of coverage under this program and take additional measures if necessary to accelerate progress so that its goal of housing for all is achieved by 2030. The four major components of PMAY-U are:

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[1] *Report of the Technical Group on Urban Housing Shortage (2012-17), Ministry of Housing and Poverty Alleviation (MHUPA), Government of India, The Housing Demand Assessment conducted under PMAY-U assessed the demand for housing as 2.83 lakhs of EWS houses in 2017 and around 20,000 applicants for home finance under the LIG and MIG category. Under PMAY- Gramin around 10,000 homeless families were identified in the rural areas of Assam. Therefore it is estimated that currently there is a total housing demand of around 3.13 lakhs.*

a. *Slum upgradation.* Under (PMAY-U) there is provision for in situ slum rehabilitation of slums using land as a resource with private participation for providing housing to eligible slum dwellers. It aims to leverage the locked potential of land under slums to provide houses to eligible slum dwellers using cross-subsidy from sale of urban slum land freed for slum rehabilitation. Slums whether on Central Government /State Government /Private/ULB land would be taken up for in situ redevelopment through involvement of private partners. There are provisions for additional Floor Areas Ratio (FAR)/ Floor Space Index (FSI)/ Transfer of Development Rights (TDR) if required to provide further incentives. There is a central assistance of average ₹ 1 lac per household and state assistance of ₹ 50,000 for each project taken under this component. By March 2022, 6500 slum dwellers in urban areas across the state (excluding Guwahati) will be provided with decent housing. The program of slum upgradation will be accelerated so that by 2030 all slums in Assam's urban areas are converted to decent housing.

b. *Housing loans to individuals.* Under the Credit Linked Interest Subsidy component of PMAY-U, home loans will be provided to the EWS/ LIG category for acquisition, construction or enhancement of houses with interest subsidy of 6.5% on housing loans upto Rs. 6 lakhs with tenure of 20 years for EWS/LIGs, and loans and beyond Rs. 6 lakhs at market rate.[2] Insufficient demand for the scheme appears to exist currently, however, as there is a general lack of financial literacy and affordability amongst the Economically Weaker Sections (EWS) and Low Income Groups (LIGs) even with interest subsidy. Therefore, the Government will monitor and consider reviewing the scheme to provide, if needed, more attractive terms. Under the Credit Linked Subsidy Scheme it is proposed to cater to around 11,000 beneficiaries in the period upto March 2022.

c. *Support to affordable housing development partners.* In addition, financial assistance will be provided to EWS houses being built through partnerships including — apart from between the Centre and State Government — with cities, municipalities and the private sector. Central assistance of Rs.1.5 lakh per EWS house is available provided the scheme includes at least 35% of EWS households; and builds at least 250 houses. Preference will be provided to physically handicapped persons, senior citizens, SC/ST/OBCs, minorities, single women, transgender and other weaker and vulnerable sections of society. The State Government will decide the ceiling price for EWS houses under this scheme. A total of 16,500 beneficiaries are expected to be covered by March 2022 under this component.

d. *Beneficiary-led construction:* This component assists eligible individuals belonging to EWS categories to either construct new houses or enhance existing houses on their own. Central assistance of Rs. 1.5 lakh per house will be provided. States can consider further incentives if needed. By March 2022, 93,300 households are targeted to be covered.

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[2] *Interest subsidy under the scheme is calculated on NPV basis @9% discount rate. The carpet area is limited to 30 sq. m. and 60 sq. m. for EWS and LIG respectively. The preference will be given to Manual Scavengers, Women/widows, SC/ST/OBCs, Minorities, differently-abled and Transgender subject to them being EWS/LIG. The Central Nodal Agencies (CNAs) to channelize subsidy to the lending institutions and for monitoring the progress are Housing and Urban Development Corporation (HUDCO) and National Housing Bank (NHB).*

e. The State will pursue cleaner, low carbon technologies.

iv. Strengthen Urban Local Bodies. A landmark constitutional amendment for strengthening urban local bodies (ULBs) was the 74th Constitutional Amendment Act, 1972 where the ULBs were given constitutional status. The Act provided for transfer of several functions to ULBs and strengthening of urban local finance through setting of State Finance Commissions (SFCs). Unfortunately, the functioning of the SFC in the state has been below expectations. Among the concerns regarding ULBs that need to be addressed are (1) lack of mechanisms for monitoring the submission of reports by the SFCs and their implementation by the State Government; (2) continued reservation by states of concurrent responsibility of functions that should have been wholly devolved; (3) even for transferred functions, there is a mismatch between the functional devolution and fiscal powers of ULBs; (4) encroachment by parastatal organizations such as the Guwahati Metropolitan Development Authority, Urban Water Supply and Sewerage Board etc. into functional areas which are traditionally the domain of ULBs with severe implications for accountability and community participation by ULBs; (5) improper functioning of the SFCs and inadequate powers given for raising financial resources; (6) lack of attention to reports submitted by ULBs.

The State Government has decided to take up the following measures to strengthen ULBs:
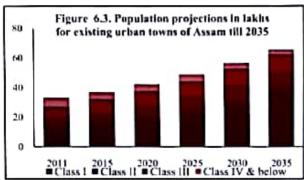
a. *Establishment of Technical Committees.* To strengthen the ULBs, it is proposed to constitute a State Level Technical Committee (SLTC) and 36 City Level Technical Committees (CLTCs) to handhold ULBs in the field of urban affairs as recommended by the Government of India. Now 32 DLTC has already been formed and are in place with 4 technical experts in each DLTC.

b. *Strengthening fiscal decentralization:* In India, cities contribute to over 60% of the GDP of the country, yet total revenue expenditure of all ULBs in the country is less than 1% of the GDP. This is more acute for Assam, where ULGs finances are in a precarious condition. The poor state of ULG finances is due to (1) lack of revenue sources linked to buoyancy of the local economy; (2) constraints on property taxes, the mainstay of ULBs, owing to irregular rate revisions; (3) poor collection of revenues; (4) unrealistic pricing of urban services such as water which remain delinked from the cost of service provision, despite required under Jawaharlal Nehru National Urban Renewal Mission (JNNURM); (5) incapacity to access capital markets through municipal bonds to raise resources;[3] and (6) lack of partnerships with private sector to outsource services or provide them in PPP modes. Thus, despite political decentralisation and some functional decentralisation, ULBs financial dependence on, and therefore control by, the state has increased.

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[3] *The Rakesh Mohan Committee Report on Urban Infrastructure (1996) mooted the use of commercial finance for urban infrastructure provision by tapping capital markets, but this has not taken off at all in Assam. This could be due to (a) public funds from JNNURM crowding out commercial funds from the capital market, (b) an inherent weakness of the ULBs in recovering the operational costs of their services, which increases their riskiness; and (c) the poor capacity within the ULBs for developing and implementing PPPs to be financed from commercial bonds.*

The Government will address these concerns and strengthen ULB's financially so that they are progressively able to rid themselves of all state dependence by 2030. Among measures that will be taken are

- SFCs will be constituted on time and due consideration given to reports submitted by them for fiscal devolution;
- SFCs urged to find new avenues for taxation for the ULBs based on their size.
- Outsourcing or services and PPP modalities with private sector will be actively promoted
- A policy devised for devolving funds to ULBs and followed vigorously.
- IT to be used extensively for increasing efficiency in collection.

c. *Developing accountability, responsiveness and participation in urban governance systems:* In Assam despite municipal elections and formation of ward committees etc., participation by citizens remains weak. The encroachment of parastatal organizations in the domain of ULBs has made participation further difficult. As a result, equity in mobilization of resources or in provision of services has not usually been achieved. Citizens' participation in matters of service delivery, municipal policy formulation, in preparation of master plans, projects etc., have been largely absent. There is little communication between ULBs and NGOs and the community as a whole. There are no mechanisms in place to obtain public feedback on availability and quality of municipal services provided through surveys or public forums such as consultative council meetings, public hearings, etc. Similarly, grievance redress mechanisms remain weak or non-existent. The Government will redress this situation in all municipalities by 31 March 2019through the following actions:

- Activating the Ward Committees, District Planning Committees, Metropolitan Planning Committees etc.
- Developing citizens' feedback mechanisms e.g. through regular beneficiary surveys, public forums, telephone hotlines, etc. to determine what people need and want, and availability and quality of municipal services.
- Install mechanisms for consulting citizens in planning and implementation of plans, programs and projects. e.g. through consultative council meetings, public hearings, etc.
- Set up effective mechanisms of effective collaboration between ULBs and NGOs, civil society, private sector etc.
- Put in place a system for monitoring and evaluation to determine that goals and desirable social ends of the programs/projects are attained and delivered to targeted beneficiaries.
- Establish procedures to ensure fair and swift action on suggestions, grievances, etc. by the public.

v. **Planning for sustainable and livable urban habitations.** Rapid urbanization will place tremendous strain on urban services and priority will be placed on advanced planning for creating sustainable and livable towns and cities in Assam. Class 1 towns historically have been gaining prominence in the overall urbanisation of the state. Focused development of Class 1 towns is

expected to have a spillover effect of development upon surrounding smaller urban centres. In addition to Guwahati, Nagaon, Silchar and Dibrugarh; 8 new cities will also become Class I towns by 2035; and 2 by 2024.By 2035, these 12 Class 1 towns are expected to constitute around 60% of the total urban population of the state of Assam (Figure 6.3).It is important to note that the strict adherence to building byelaws will be done in the process of development and planning of other cities and towns.

Figure 6.3. Population projections in lakhs for existing urban towns of Assam till 2035

Out of 97 cities/towns in Assam, master plans have been prepared for 38 cities so far; while master plans are under preparation for 45 more. By 2024 the number of urban centres are expected to rise to about 110.The Government will ensure that all master plans for all are ready by 2024 in GIS based platforms.

Livability sustainability will be emphasized in master plans. In particular the Government will emphasize the following areas:

a. *Urban environment.* Assam will ensure that all urban centers meet environment norms for all air quality indicators (CO_2, SPM, NO_2, SO_2 etc.) by 2030.Similarly there are plans to develop public toilets under Swachh Bharat Mission and all urban centres will have adequate public toilets for their needs by 2024.The current gap in solid waste management of 180 tonnes per day for Guwahati will be filled by 2024.Similarly SWM gaps for all other urban centres will also be removed by 2024.

b. *Basic urban services.* Sustainable cities require adequate clean water supply; proper lighting; sufficient parks and playgrounds; adequate parking facilities; electric crematoriums; easy access to buildings, toilets, transport and other facilities by differently abled citizens. Municipal water supply will be made available to all urban residents of Assam by March 2024. Barrier free access for differently abled persons do exist in the building bylaws of Guwahati and the Building Rules of Assam modified in 2014.These will be given effect to on priority. There are currently plans to develop parks in Guwahati under the AMRUT project and this will be extended to other urban areas in phases. The current gap of over 75,000 lights will be fulfilled by 2024. An automated parking facility has been constructed in Guwahati near zoo road, for allying traffic problems in Guwahati. Similar efforts will be made for other towns and cities. To promote reading and culture, a central library cum auditorium and another auditorium will be built in Guwahati and the old DC bungalow turned into a Heritage and Handloom Museum by 2017. Similarly, all needed basic urban services will be expanded in phases and gaps in such services will be removed from all urban areas in the state by 2030.

d. *Building smart cities in Assam.* The Government will use IT to provide better urban services to citizens through the Smart cities program. Currently, Guwahati alone has been identified but The Government will extend this program to all cities by 2030.

i. **Communities and citizen's groups.** The Government will encourage all cities and municipalities to establish active consultative processes with citizen's groups and urban communities. All cities and municipal local governments will set up such active consultative processes by 30 June 2018.

ii. **Private sector.** There is insufficient involvement of the private sector in creation of urban infrastructure and provision of urban services. With the rapid urbanization that will take place in Assam, public provision alone will be incapable to fill the needs. Therefore the state government will actively seek and promote private sector participation and will review policies and facilitation mechanisms by 30 June 2018 so that a proper environment for private sector participation in urban development is created.

iii. **Convergence with other programs.** Under housing, convergence will be achieved betweenPMAY-HFA (U) Assam and Assam State Urban Livelihoods Mission Society (ASULMS) to tap into the community human resource support available with ASULMS. Community cadres and community institutions of ASULMS work with ULBs to include slum dwellers into PMAY-HFA (U). The Government will also focus on the livelihood component under the schemes available under DAY-NULM. Comprehensive survey of slums will be done to obtain actual slum dwellers, along with an understanding of their socio-economic status. Similar convergence possibilities will be identified and synergies between programs promoted.

6. Resources

i. **Human Resources.** Recruitment, training and retention of capable human resources is essential to meet the scope of service delivery with quality standards as envisaged under the SPAP. The entire staff should be run on basis of performance based management systems utilizing modern HR methods. There is a dire need for qualified and motivated Human Resource Team at the administrative, managerial and oversight levels and in the technical levels. At the oversight level, each field level office requires a strong team for M&E, quality control, and better coordination with all concerned stakeholders. At the technical level, there is a need to increase engineers and allied IT and technical staff skilled in all areas of urban infrastructure and delivery of services. To close these gaps in a phased manner, the Government will take the following steps:

a. Creation of a proper data base of all categories of HR staff by 30 June 2018.

b. Create a cadre, with suitable pay scales, including openings for lateral entries, to attract and retain talent by March 31 2018.

c. Expansion of technical and allied technical staff in phases

d. Establishing a dedicated recruitment board, for recruitment by 31 March 2018.A cadre for ULBs has to be developed. There has to be sustained efforts to recruit, train and motivate them so as to help them perform their jobs efficiently and effectively.

ii. **Financial Resources.** Necessary arrangements for mobilization of adequate financial resources is quite critical, for achievement of targets envisaged under SDG-11. Hence apart from (i)

greater revenue generation from their own internal resources; (ii) It will be necessary initially for ULBs to rely mainly on grants from the state government budget and transfers from Central government; and to (iii) establish linkages with Externally Aided Projects and Corporate Social Responsibility (CSR) programs of the private sector. (v) Finally, resources can be augmented by increasingly outsourcing and partnering through PPP and other modalities with the private sector.

7.   Coordination arrangements for Goal 11

Goals	Lead Department	Supporting Departments		Cross Cutting Departments
Goal 11 Sustainable Cities and Communities	Urban Development, GDD	PWD, Environment & Forest (improved air quality), Power	Transport, Cultural Affairs,	Social Welfare (Gender), WPT & BC, Tea Tribes Welfare, Minority Development, Char Areas, Hill Areas, Science & Technology, Information Technology, Information & Publicity. Transformation and Development, and Finance Departments (Oversight)

Appendix 6.1: Gaps in urban infrastructure excluding Guwahati.

Result of the As-is analysis: Gap in urban infrastructure development indicators across ULBs (excluding Guwahati)

Sector	Current Supply	Demand*	Gap (Current)	Gap (In 2035)**
Water Supply	120 MLD	319 MLD	199 MLD	460 MLD
Solid waste management	325 TPD	650 TPD	325 TPD	1295 TPD
Sewerage	0	270MLD	270MLD	488 MLD
Urban transport	Urban Roads: 1515 Kms No organised public transportation system	Urban Roads: 4072 Kms	Urban roads 2557 Kms Bus depots: 26 Total Buses: 119	
Street lighting	47,895	123,600	75,705	
Storm water drainage	400 Kms	100% coverage	1,100	3,672
Urban Housing			1.7 Lakh (EWS and LIG only)	3.7 Lakh (EWS and LIG only)

* As per normative benchmarks

Result of the As-is analysis: Gap in urban infrastructure development indicators in Guwahati

Sector	Current Supply	Demand*	Gap (Current)	Gap (In 2035)**
Water Supply	70 MLD	190 MLD	130 MLD	Expected capacity by 2035 – 421 MLD Expected demand – 391 MLD Gap - NIL
Solid waste management	80% of total waste generated i.e 440 TPD.	550 TPD	110 TPD in collection. Treatment and scientific disposal is absent throughout the Guwahati.	1000 TPD
Sewerage	NIL	147 MLD	147 MLD	284 MLD
Urban transport	Urban Roads 460 Km Around 2380 vehicles providing Public transportation services	3234 Km 40 buses per lakh population	2774 Km Around 500 buses should be there	Urban road 3558 Km MRTS and BRTS system may be required
Street lighting	16100	Average spacing between lamp post should be 40 meters	70300	84350
Storm water drainage	420 Km	100% coverage	2278 Kms	3598 Kms
Urban Housing			1.1 Lakh	2.3 Lakh

* As per the benchmarks
** Gap if current supply levels are maintained
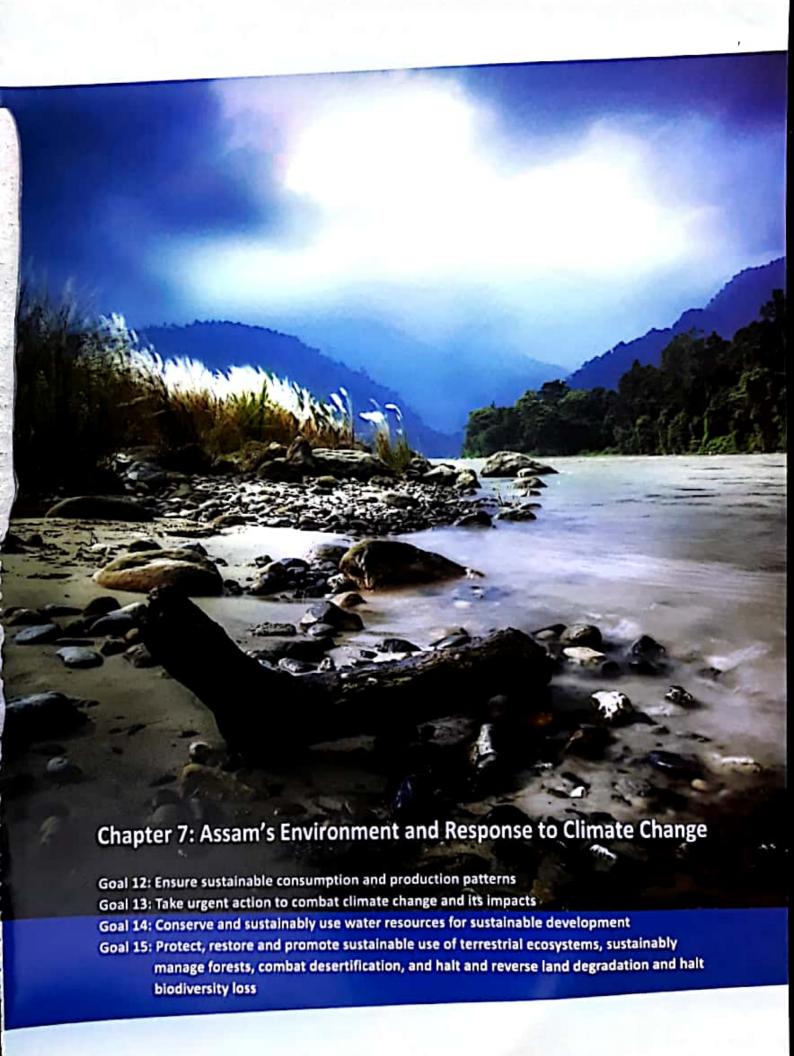
Appendix 6.2: Detailed estimation of resource requirements

i.   **Road Network:** 2018-20 required budget: 772 crores, required by 2023-24: 1800 crores, and 2025-30: 1800 Crores

ii. **Public transport system:** 2018-20 required budget: 150 crores, required by 2023-24: 360 crores, and 2025-30: 360 Crores

iii. **Green transport corridors:** 2018-20 required budget: 90 crores, required by 2023-24: 200 crores, and 2025-30: 200 Crores

iv. **Cycle Tracks:** 2018-20 required budget: 150 crores, required by 2023-24: 300 crores, and 2025-30: 300 Crores

v.   **Pedestrian friendly environments in towns and cities:** 2018-20 required budget: 100 crores, required by 2023-24: 200 crores, and 2025-30: 200 Crores

vi. **Traffic Management system:** 2018-20 required budget: 40 crores, required by 2023-24: 100 crores, and 2025-30: 100 Crores

vii. **Adequate Road safety measures:** 2018-20 required budget: 40 crores, required by 2023-24: 100 crores, and 2025-30: 100 Crores

viii. **Urban housing:** Current Gap 3,20,000 dus. Schemes: PMAY. Target year: 2022. Central Assistance: 3360 Crore. State Contribution proposed: 1120 Crore.

ix. **Water supply:** Current Gap 199 MLD. Schemes: AMRUT, 10% Pool fund, NLCPR. Target year: 2024. Project Cost: 637 Crore. Central Assistance: 573.3 Crore State Contribution proposed: 63,7 Crore.

x.   **Sewerage and sanitation:** Current Gap 417 MLD. Schemes: AMRUT. 10% Pool fund, NLCPR. Target year: 2024. Project Cost: 592 Crore. Central: Assistance: 533 Crore. State Contribution proposed: 59.2 Crore.

xi. **Solid waste management:** Current Gap 435 TPD. Schemes: AMRUT. AMRUT, 10% Pool fund, NLCPR. Target year: 2024. Project Cost: 50.0 Crore. Central Assistance: 45 Crore. State Contribution proposed: 5.0 Crore

xii. **Storm water drainage:** Current Gap 3378 Km. Schemes: AMRUT, 10% Pool fund, NLCPR. Target year: 2024. Project cost: 592 crore. Central Assistance: 533 Crore. State Contribution proposed: 5.9 Crore

xiii. **Urban transport:** Current Gap Urban roads 5332km. 700 Buses. Schemes: PMAY. Target year: 2024. Project Cost: 2370 Crore. Central Assistance: 2133 crore. State Contribution proposed: 23.70 crore

xiv. **Street lighting:** Current Gap 1,50,000 lights. Schemes: 10% pool fund, NLCPR. Target year: 2024. Project Cost: 84.64 Crore. Central Assistance: 76 Crore. State Contribution proposed: 8.64 crore.

xv. **Assam Municipal Development Project (AMDP):** AMDP project for Urban Capacity Building and Institutional Development has been submitted for world bank assistance for an amount of Rs.1268.24 Crore to be executed during a period of 6 years. An amount of Rs. 635.00 Crore will be required for improving urban services in Assam, capacity building of ULBs and establishment of State Level Urban Institution.

Chapter 7: Assam's Environment and Response to Climate Change

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 water resources for sustainable development

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

Chapter 7: Assam's Environment and Response to Climate Change

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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

1. Introduction

Building on the accomplishments of the MDGs, in September 2015 Heads of State and Government agreed to set the world on a path towards sustainable development through the adoption of the 2030 Agenda for Sustainable Development. The SDGs aim to mobilise international action over a 15-year period from 2015 to 2030 in a number of areas of critical importance for humanity and the planet, referred to as the five "P's": people, planet, prosperity, peace, and partnership. This chapter discusses the Sustainable Development Goals (SDGs) 12, 13, 14 and 15 as adopted by Assam. These goals together represent the core of the climate change mitigation and adaptation strategies of the State, and hence have been take together in this Chapter. The Assam State Climate Change Action Plan (SAPCC) which is already approved by the Government of India provides a substantial basis to the interventions proposed. Additionally, the Government of Assam proposes to set up the Assam Fund for Life as a dedicated instrument to support such initiatives under the overall umbrella of the Assam Climate Change Management Society.

Environment has a large impact on the welfare of Assam's population and its economy. Each of the four Goals considered in this chapter are critical as discussed below.

Sustainable Consumption and Production (Goal 12): Assam is rich in natural resources, minerals, forests, water and vast tracts of fertile land. However, with the development process envisaged for the state, achieving sustainability across all development interventions is crucial. Accordingly, Government of Assam has included targets for efficient use of natural resources; proposed reduction of food waste along production, supply chains and post-harvest losses by half and reducing waste generation through prevention, reduction, recycling and reuse by 2030. Steps to build environmentally sound management of chemical and e-waste based on internationally agreed frameworks is also in the agenda. These will be achieved through collaborations with entrepreneurs, businesses, and international agencies.

Climate Action (Goal 13): All countries across the world are experiencing the drastic effects of climate change. Greenhouse gas emissions continue to rise, and are now more than 50 percent above their 1990 level. The CO2 concentration in the world's atmosphere reached 409 ppmv by

end May 2017, just 41 ppmv short of the cut off limit of 450 ppmv. Global emissions total 355.9 GtCO2 per annum currently. Global warming is causing long-lasting changes to our climate system, with irreversible consequences if not halted. India has committed to reduce its emissions intensity of GDP by 33-35% by 2030, by achieving a 40% share of renewable sources of energy in the total cumulative installed energy capacity and additional carbon sinks of 2.5-3 GtCO2 by 2030. Assam is committed to help achieve these national targets. The State will achieve carbon neutrality by 2030, and has already formulated its State Action Plan for Climate Change. Accordingly, all Government departments will align their respective development strategies to achieve the INDCs (Intended Nationally Determined Contributions) for climate change mitigation.

Conservation of Water Resources (Goal 14): Assam has abundant water resources with significant geographical area covered by rivers and *beels*. In recent years, economic activity near rivers has increased significantly, putting more pressure on available water sources for consumption and waste disposal. To prevent degradation of water sources, therefore, effective measures with strict adherence to Water (Prevention & Control of Pollution) Act, 1974 as amended till date for their rejuvenation and conservation are required. The state will sustainably manage and protect the freshwater ecosystem, restoring them to a healthy and productive state by 2020, by preventing deterioration of quality and preserving their pristine nature by focusing on regulating disposal of waste into rivers and *beels*.
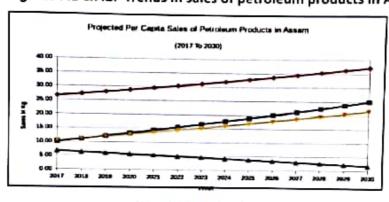
Life under Water & on Land (Goal 15): The floral and faunal biodiversity of Assam is immense and so are the challenges to their protection and conservation. Assam is the most populous state in North-East India and has the highest density of population. About 37% of its geographical area is under green cover. Therefore, balancing the pressures of development and conservation is an onerous task. The mighty river Brahmaputra that annually inundates thousands of villages and erodes large chunks of land poses another daunting challenge. Despite these constraints, Assam will adopt necessary steps to increase its carbon sinks. It holds 3.9% of India's total forest cover of India, and may be required, correspondingly to create about 4% of the carbon sinks declared by India. This amounts to creating 120 MtCO2 sinks which in turn translates to planting more than 5.0 crores of saplings annually till 2030.

2. Goals and targets.
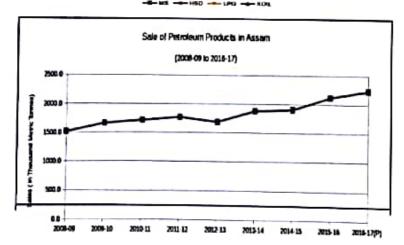
The key indicators to monitor Assam's environment and needed response to climate change—both mitigation and adaptation measures—are listed below. The key departments identified for mitigation are Environment & Forests, Pollution Control Board, Power, Transport, Industry, Agriculture, Animal Husbandry & Veterinary, Guwahati Development, Urban Development, and Science & Technology (ASTEC). For adaptation measures, the key departments identified are Environment & Forests, Soil Conservation, Fishery, Agriculture, Water Resources, Sericulture, Revenue & Disaster Management, Panchayat & Rural Development, Food & Civil Supplies, and Cooperation. The Environment & Forests Department is responsible for overall coordination through the proposed Assam Climate Change Management Society with the Assam Fund for Life as its brand equity; for generating resources across the Government; and advising all departments and stakeholders of climate friendly interventions.

fans, low power comfort cooling, solar heating etc. All government building and public infrastructure must conform to green building standards by 2030.

iii. **Reducing share of consumption of fossil fuels.** Assam is one of the major producers of crude oil in the country, but almost all the production is consumed outside the State. The consumption (sales) of total petroleum products in the State for 2012-13 was 1686 TMT being just 1.14% of total sales in India which rose to 2235 TMT in 2016-17 or 1.30% of total national sales. The consumption pattern in the state can be seen in Figures 7.1 &7.2 below. Projections of petroleum products indicate that all (HSD, MS and LPG) are on the rise except KOIL indicating its gradual replacement by electricity/LPG at the household level.

Figures 7.1 &7.2: Trends in sales of petroleum products in Assam

Source: Petroleum Planning & Analysis Ministry of Petroleum and Natural Gas, Govt. of India [4]

Coal consumption, another fossil fuel, is declining as per reports of the Coal Ministry, measured by coal dispatches (Figure 7.3). This is a healthy sign for Assam which targets to be carbon neutral by 2030. The main factor for the decline is substitution of coal by natural gas in tea gardens, growth in LPG, and usage of power as energy source.

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[4] *Petroleum Planning & Analysis Cell, Ministry of Petroleum and Natural Gas, Govt. of India (NOTE: the projections are of the author)*
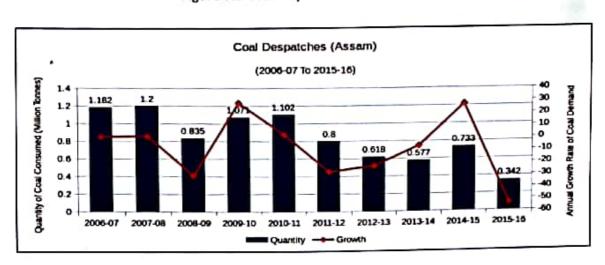
Figure 7.3 Coal dispatches to Assam 2006-2016

*Source:*Coal Despatches Reports of the Ministry of Coal, Govt. of India.

Thus, while consumption of petroleum products in the state though small in comparison to production is showing some growth, the consumption of coal is showing a decreasing trend indicating that consumption of fossil fuels overall is currently stable. With increasing growth, however, as the demand for fossil fuels may increase they will have to be substituted increasingly by renewables. The overall consumption of fossil fuels must be closely monitored therefore and their share in total energy consumption reduced so that the objective of a carbon neutral Assam by 2030 is achieved.

iv.   **Promoting cleaner construction technologies.** The reduction in use of cement and bricks through use of alternate construction materials will contribute significantly to green growth. While cement use in concrete leads to carbon capture (almost about 0.5 tCO2/ ton of cement usage), it is a CO2 emitter at source. The cement consumption in Assam was about 1.08 million tonnes in 2007-08, which went up to almost 2.03 Mt in 2011-12. It is expected that by 2030, cement consumption would touch 7.5 Mt in the state.

The state will also pursue cleaner low carbon construction technologies such as Low Carbon Emission Concrete (LCEC); carbon capture and storage (CCS) processes; brick production technologies[5] such as VSBK, CEBs, Zig-Zag technology which use alternate materials to make bricks such as river sand and silt. It will adopt a policy to construct all public buildings using alternate technologies and materials and set up a Task Force by December 2018 for promotion and usage of alternate construction materials and technologies.

v.   **Increasing share of renewable energy in total energy generation.** The current installed capacity of renewable energy generation is 8 MW constituting only 2.08% of the total energy mix

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[5]The market demand in Assam of bricks is more than 2500 million bricks per annum. There are around 912 authorized brick kilns with an equal number or more of unauthorized kilns operating across the state. These are set up mostly on agricultural land. The current brick production in Assam alone releases mor]hhe than 1.6 million tons of CO_2 per annum into the atmosphere 5 which accounts to more than 25% of total construction sector related emissions and around 8% of total CO_2 emissions in Assam

of power generation (384.7 MW) in the state. Total power generation isprojected to go up to 3104.90 MW by 2030. The state meets a significant portion of its total energy demand by importing power most of which is thermal. The current power demand is 1456 MW which is slated to go up to 4017 MW by 2030. Thus, the emission intensity of power consumption attributable to the state is high. Therefore, to achieve carbon neutrality Assam has targeted increasing the share of renewable energy generated to 40% by 2030.

While it is estimated that the greatest potential among renewable energy sources in the state is solar, efforts to increase use of other renewable sources will be made. Use of biomass in electricity generation (such as waste to energy programs by urban local bodies) will also be actively pursued.

vi. **Pursuing carbon neutral agriculture and animal husbandry.** The statewill actively promote use of renewable of energy based appliances in agriculture; expand the cultivated area under System of Rice Intensification (SRI); and promote use of appropriate diets that suppresses methane generation in cattle.

B. Making Assam Pollution Free by 2030

Assam has a number of laws to control pollution[6] and the Pollution Control Board (PCB) to implement them. The Government will take measures in consultation with PCB to strengthen its implementation capacity. In addition, focused attention will be provided to the following four major areas to achieve a pollution-free Assam.

i. **Reducing water and air pollution.** The PCB, Assam is the statutory body that gives consent to establish/ and to provide No Objection Certificates to various industries. Industries have been classified as Red/ Orange/ Green from the pollution perspective for better monitoring. The PCB's capacity to perform this regulatory function will be strengthened. With the measures to be adopted as enumerated below, Assam's air and water quality is targeted to conform to National Standards by 2030.

The following specific measures will be taken to reduce water pollution:
a. Establishing a system of continuous monitoring of pollutant load in surface and ground waters through analysis of samples drawn at multiple points, and creating a repository of GIS based thematic maps for pollutant loads.
b. Ensuring effective effluents/sewage treatment at source, through industry/community based installations.
c. Ensuring pollutant free potable water through scientific water treatment.

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[6]The Pollution Control Board of Assam, which is a statutory body created under the Water (Prevention and Control of Pollution) Act, 1974, as amended up to 1988 implements the following Acts & Rules among others: (i) The Water (Prevention and Control of Pollution) Act, 1974, as amended up to 1988; (ii) The Water (Prevention and Control of Pollution) Cess Act 1977, as amended by Amendment Act, 1991; (iii) The Environment (Protection) Act, 1986; (iv) The Air (Prevention and Control of Pollution) Act, 1981, as amended by Amendment Act, 1987; (v) The Public Liability Insurance Act, 1991; (vi) Re-cycled Plastics Manufacture and Usage Rules, 1999; (vii)   Manufacture, Use, Import, Export and Storage of Hazardous Micro-Organisms; (viii) Genetically Engineered Organisms or Cells rules, 1989; (ix) Hazardous Wastes (Management and Handling) Rules, 1989; (x) Bio-Medical Waste (Management and Handling) Rules, 1998; (xi) Municipal Solid Wastes (Management & Handling) Rules, 2000; (xii) Noise Pollution (Regulation and Control) Rules, 2000; and (xiii) Ozone Depleting Substances (Regulation) Rules, 2000

d. Introducing zonation, and indigenous technology based solutions for high arsenic/fluoride areas.

e. Reducing pesticide and fertilizer load in surface/ground water through shifting to organic farming and integrated pest control.

f. Developing disease prevalence maps and tracking them across years in the entire state

g. Increasing the number of monitoring stations on sensitive river bodies and *beels*/lakes under National Water Quality Monitoring Programme (NWMP).

h. Setting up treatment plants in areas where rivers are found with excessive organic load, as they often carry sewage of neighboring localities.

Similarly, specific measures to be taken to reduce air pollution include:

a. Establishing a system for continuous monitoring of air pollution at multiple points using IoT (internet of things) enabled devices and sensors, and creating a repository of GIS based thematic maps for pollutant loads.

b. Monitoring of air quality effectively in cities and town, and providing public displays at prominent places to create public awareness.

c. Regular pollution/emissions checking of vehicles/factories, and lowering the number of privately owned vehicles by promoting use of High Occupancy Vehicles (HOV) and strengthening public transport

d. Introducing policy to phase out old vehicles (more than 10 years old)

e. Halting open burning of garbage with imposition of fines on defaulters

f. Introducing/enhancing clean technologies in industrial units and discouraging use of fossil fuels.

g. Banning coal fired *chullahs* and use of firewood in hotels and open spaces.

II.   **Reducing pollution from solid wastes**: Waste generation is rising steeply with new and complex waste streams emerging that are difficult to handle. Poor collection and indiscriminate disposal of untreated waste have led to contamination and degradation of natural resources and ecosystems posing risks to human health. The Solid Waste Management Rules, 2016 has to be strictly followed. Furthermore, the following measures will be adopted to control solid wastes in partnership with municipal authorities, such as GMC and GMDA; responsible Government departments; NGOs; appropriate private sector bodies; and other stakeholders:

a. Ensure segregation at source of solid waste generated from households, institutions, commercial establishments (with recyclables e.g. plastics, biodegradables e.g. food waste etc. and hazardous wastes stored separately).

b. Setting up of more organic municipal waste compost facilities for conversion of waste to energy.

c. Registration of vendors selling, stocking, using plastic carry bags incompliance with plastic Waste Management Rules, 2016; and penalizing vendors selling plastic bags which do not conform with these Rules.

d. Mandating health care establishments to take all necessary measures for

proper disposal of bio-medical wastes in compliance with Bio-Medical Waste Management Rules, 2016.

e. Setting up of E-waste collection centers (e.g. for end of life computers, mobile phones, consumer electronics) for proper channelization of E-wastes to recyclers.

f. Setting up of sewage treatment plants, water recycling and reuse systems and include the same in GMDA Building Byelaws.

g. Introduce scientific and systematic collection, storage and disposal of non-hazardous solid wastes/hazardous non-radioactive wastes/ hazardous radioactive wastes/bio-medical wastes/e-wastes, etc., through establishing systematically planned landfill sites/common disposal facilities.

h. Ensuring strict enforcement of existing solid waste management laws.

iii. **Minimizing light and noise pollution**: While noise pollution is covered under Noise Pollution (Regulation and Control) Rules, 2000 for which implementation needs and will be strengthened, there is no law for light pollution which can be defined as "brightening of the night sky caused by street lights and other man-made sources, which has a disruptive effect on natural cycles and inhibits the observation of stars and planets"[7]. Light pollution is harmful for human health and ecology, and confuses animal navigation at night. Enforcing appropriate types of fixtures for lights so that no light escapes to the sky is required. Excessive use of light also causes carbon emission and is thus undesirable. Necessary policy measures to control light pollution will be introduced by 2018.

iv. **Special strategies for high polluting industries — brick kilns and tea.** Traditional brick manufacturing requires considerable land and top soil. The land used by the kilns go to waste after they are abandoned owing to the high temperatures employed making them unfit even for agricultural activities. Brick kilns in operation release air pollutants such as carbon monoxide, carbon dioxide, sulfur dioxide, nitrous oxides and suspended particulate matter. Currently brick kilns release more than 1.6 million tons of CO_2 per annum accounting for above 25% of total construction related emissions and around 8% of total CO_2 emissions in Assam. The bottom ash deposits from kilns also result in land and water pollution and disturb the flow of natural streams, rivers and *nallahs*. In Assam, clay brick production has risen rapidly to 2500 million bricks per annum[8] due to the change in construction practices from traditional Assam style houses to RCC framed houses. There are around 912 authorized brick kilns with an equal number or more of unauthorized kilns operating.[9] Limiting pollution from brick production is therefore a priority to achieve which several measures are needed. These include (a) changing brick production technologies and processes by shifting towards efficient brick firing processes and manufacturing technologies; and alternative materials utilization; (b) changing perceptions through awareness and capacity building respectively of brick users and builders about benefits and durability of bricks made from waste and alternate materials to move construction from using red bricks to these substitutes.

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[7] *Google Online Dictionary*
[8] *Guidelines on Brick manufacturing unit, PCB, 2013*
[9] *http://www.indiaenvironmentportal.org.in/content/374053/193-illegal-brick-kilns-in-assam/*

The number of tea gardens has risen from 825 in 2007 to 78856 in 2012.[10] The processing of tea consumes significant electrical and thermal energy adding to GHG emissions. The industry typically uses thermal energy from fuel wood in withering and drying of the leaves. Electrical energy is also consumed in cutting, tearing and curling process, running fans for the withering and drying and motors for vibrating, sorting and grading the tea and for lighting. Replacing unsustainably sourced fuel wood by creating centers that distribute sustainably sourced fuel wood, adoption of new generation boilers with higher efficiency for reduced fuel consumption; and shifting to renewable energy generation by installing solar panels in the open areas in tea gardens.

C. Climate Change Adaptation and Developing Climate Smart/Resilient Communities

Assam is primarily an agrarian economy with 86% of its employment in agriculture and allied activities such as fisheries and forests, which together contribute 34% of the GSDP.[11] Emerging rainfall trends indicate decrease in rainy days and increase in extreme rainfall events with adverse impact on crop production. Adapting to climate change is therefore essential. The following main areas will be emphasized.
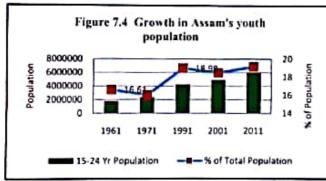
I. **Developing climate-smart agricultural practices and systems.** Although the state'spopulation has been adapting to changes in the environment for years, recent climate related changes have been rapid with a larger shift in the sowing and harvesting seasons and unpredictability and increase in intensity of rainfall. These have resulted in reducing farm productivity and incomes. Steps for climate proofing of agricultural practices and systems have therefore to be intensified. Main measures to be adopted in a time bound manner (timelines to be decided by March 2018) include:

a. Assessing vulnerabilities of the sector to climate change along with assessing on-farm coping practices of farmers, district wise

b. Adopting value chains based strategy and providing marketing support for climate vulnerable crops in most vulnerable agro-climatic zones for building resilience

c. Conversion of existing soil testing practices to soil health management system

d. Introducing new crop varieties that are less water intensive. Developing water and temperature stress tolerant varieties with focus on integrating C4 characteristics in C3 rice to make photosynthesis efficient at higher temperatures and hence make rice plants temperature and water stress resilient

e. Establishing seed banks at community level

f. Strengthening water conservation through watershed development approach and developing adequate water harvesting structures including farm ponds for multiple use, percolation tanks, repairing and renovation of existing water harvesting structures, in-situ moisture conservation through summer ploughing and conservation tillage through awareness training

g. Establishing a Custom Hiring Services (CHS) Centre to help small and marginal farmers in accessing and using mechanization effectively

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[10]*Assam State Action Plan on Climate Change, 2015*
[11]*Assam State Action Plan on Climate Change, 2015*

h. Substituting inorganic fertilizers with organic manure and bio- fertilizers

i. Encouraging crop diversification and integrated farming

j. Establishing early warning systems on climate risks at district level

k. Promotion of crop insurance mechanisms for the farmers through central schemes like *Pradhan Mantri Fasal Bima Yojna* (PMFBY)

l. Developing integrated pest and disease management systems

m. Promoting engagement of women in post-harvest processing and value addition

n. Establishing farmer companies (village cluster approach in 14 villages)

o. Establishing a market intelligence cell

ii. Developing alternative livelihoods. Assam's growing youth population (Figure 7.4) is already placing increasing pressure on the government to create livelihood opportunities for the youth. This will be exacerbated by climate change. The following alternative livelihood activities will be pursued vigorously.

Figure 7.4 Growth in Assam's youth population

15-24 Yr Population   —■— % of Total Population

Source: Census of India

Agriculture/Forestry activities. Agricultural and forestry sector livelihoods such as nurseries, floriculture, orchid culture, horticulture, bamboo and cane, dairy farming coupled with a good market network will be encouraged. Although small tea gardens can provide considerable employment, their growth must be dealt cautiously to minimize their adverse ecological impacts and impacts on wildlife, especially human-elephant conflicts. Similar is the case with rubber cultivation.

Fisheries. Fisheries using both natural and man-made *beels* has considerable potential in the state. The following actions will be adopted in the next five years.

a. Creation of updated state level database on water and fisheries to estimate potential production

b. Encouraging fisheries in small back yard ponds, culturing small indigenous fresh water fish species

c. Intercropping of medium carps with Indian Major Carps (IMC) in farmer ponds

d. Identification of potential areas for fish farming with paddy and its promotion with villagers

e. Setting up fish feed mill to produce formulated balanced feed for the farmers and fisheries

f. Developing packages of practices for fishermen to sustain production in a climate change context

g. Capacity building towards producing beneficiated products

h. Establishing block level kiosks for fishery related information dissemination

Other alternate livelihoods. These include tailoring, knitting, handicrafts, weaving, bamboo works, cane works that will be promoted in clusters in rural areas, especially in forest fringes and disaster-prone areas.

iii. Community disaster management. While the state government has designated Assam State Disaster Management Authority for management of disaster related initiatives in the state, community led disaster management actions play an essential role in averting damages from disasters induced by climate change. They will be strengthened by the following measures:

    a. Awareness campaign on do's and don'ts during and after disasters to avert loss of life and damage to property

    b. Developing gender based localized disaster management plans

    c. Developing a system for collection of Met data for mapping district wise vulnerability status and development of early warning systems for floods that would help the farmers in evading losses

    d. Building awareness of the farmers on benefits of weather indexed crop insurance, its procedures, nature of protection and simplification of conditions for the them, so that they can access the insured sum in an event of floods and droughts.

iv. Integrated community development plans/ village micro plans. As weaker sections of society have lower adaptive capacity and are hit the hardest by the impacts of climate change, the following special measures focused on them will be adopted.

    a. Training and capacity building of the community on co-managing of wetlands, through a community enterprise system that insures generation of income for its effective management

    b. Communities will be encouraged to maintain and develop wetland areas into parks and generate income through aqua-tourism.

    c. Developing sericulture and rural industry; housing for all; and livelihood generation through community led efforts will be promoted (see details in Chapter 1).In addition, care will be taken to see that the schemes are environment friendly. For example, housing schemes will be tailored to focus more on low carbon housing infrastructure with low energy consumption during the life-times of the houses. In forest and wildlife areas, where animal depredation is high and man-animal conflict situations arise very frequently, housing raised on stilts and props (locally called "Chang") will be promoted.

D. Assam Fund for Life (AFL)

An Assam Fund for Life (AFL) would be set up to fill the gap in resources to achieve the environment and carbon neutral objectives of Vision Assam 2030. The fund would be managed by the Assam Climate Change Management Society (ACCMS). It will enable Government departments to depart from 'Business as Usual Scenarios' by funding gaps to access to clean development technologies and strategies for government schemes, and to support the Government achieve its environment and climate change goals under the SDGs. The blueprint of AFL, including institutional

framework, fund disbursement structure and partnership map, will be presented in the first governing body meeting of ACCMS after it is notified by June 2018. Key interventions of the AFL include:

i. **Provision of expertise and capacity.** AFL will identify and hire technical and domain experts for climate vulnerable sectors to ensure that all projects incorporate climate change mitigation and adaptation components in them. It will help climate vulnerable departments in prioritizing and phasing climate actions, so that the departments are able to implement the actions using their own funds. Carbon neutrality being central to the mitigation agenda of the state, the fund will identify and promote actions with lower carbon foot print in the state. It will develop a framework for aligning activities to contribute to carbon sequestration – away from business as usual approach (e.g. paying tax against emissions for maintenance of forests; initiatives for adaptive forestry etc.) Training modules will also be developed on various sectors for regular and continuing capacity building.

ii. **Research and Knowledge Management.** AFL will provide funds for (a) carrying out sectoral research for (a) clean technologies, models, forestry models based on vulnerability assessments; (b) measuring tools – LPI, RLI, VI, CCAI etc.; (c) networking and exchange programmes, organisation of seminars, workshops etc., to create a cross-learning platform in the state; (d) undertaking publications of knowledge products including models developed and their dissemination; (e) establishing an M&E system for monitoring and assessing environment and climate related SDG outcomes.

iii. **Establishing coordination mechanisms.** AFLwill develop a system of effective coordination within departments through quarterly meetings to discuss environment and climate related state, national and international commitments and take decisions on actions to be taken.

iv. **Fund Management.** AFL will carry out a detailed review of SPAPs and SAPCC actions to analyze funding needs and sources from private sector, public sector, international sources, and map crowdfunding opportunities. It will mobilize departments to develop concept papers and project reports for accessing environment and climate change funds. Assam receives funds through external sources which includes both centrally sponsored schemes and loans from national and international agencies. Government of Assam has previously accessed INR 24.7 crores under National Adaptation Fund for Climate Change (NAFCC). Funds accessed will be parked at AFL, which will disburse them as needed.

E. Reduce, Reuse & Recycle – Managing waste reduction in production & supply chains

Reduce, reuse and recycle are referred to as 3R and together help in conserving resources and energy and minimizing waste. The Government is committed to 3R and will pursue them vigorously focusing on three main areas with timelines as indicated in the detailed actions (a) to (f) below:

i. 3R implementation in Industry & Power (production sector)
ii. Waste to wealth

iii. Waste reduction in supply chain

The actions to be initiated for achieving these will include:

a. Drafting a comprehensive 3R and Waste to Wealth Policy of the Govt. of Assam by 30 December 2018

b. Implementation of internationally accepted framework for environmentally safe management of chemical and other wastes from industries, through developing a robust monitoring and evaluation (M&E) system for waste disposal in the state. The M&E system will be in place

c. Implementing regulations to reduce the release of waste materials in to air, water and soil by strengthening evaluation systems and increasing penalty in case of violation. An initial batch of regulations will be drafted by December 2018

d. Application of technologies for converting waste to wealth, by mobilizing youth and communities to take decentralized actions

e. Increasing cold storage and other appropriate infrastructural options for reducing food wastage in the agricultural supply chain

f. Developing an inventory of e-waste in government offices by December 2018 and initiating actions for their recycling

F. Sustainable Forest Management & Carbon Sequestration

This is the core of the CO_2 mitigation and carbon sequestration strategy and consists of the following major interventions:

i. **Sustainable forest management (SFM) planning, timber harvest and fuelwood**
II. **Raising carbon sink plantations and canopy densification**
iii. **Soil and water conservation in upstream/upland forests**

The Forest Department will introduce new methods of raising carbon sink plantations that would cover several thousand-hectare area per annum, and would involve gap planting to ensure densification of canopy density. Growing stock will be expanded from 143.7 million cubic meters in 2016-17 to 300 million cubic meters by 2030-31. The Department would also identify Sustainable Forest Management (SFM) areas, especially around the fringes/ waste lands that would be managed for production forestry. No area which is within 500m of major streams, on steep slopes or higher reaches shall be harvested. The plantation activities shall have inbuilt component of soil and water conservation.

The actions identified and to be taken (except those that are continuing) by timelines indicated below:

a. Consolidation of forest boundaries to be completed by March 2019.

b. Developing (by December 2018) and implementing sustainable harvesting protocols for forest products.

c. Implementing certification of sustainable forest products

d. Accelerating actions on soil and moisture conservation for upland forest areas

e. Taking actions for reducing dependence on fuelwood

f. Developing and promoting alternative livelihood options and marketing strategies

g. Developing by December 2018 centralized monitoring (controlled by a single/ collective of departments) using High Resolution RS/ GIS with crowd sourcing of information involving public through mobile/ IT technologies

h. Restoring wetlands and rejuvenation of natural channels. Identification to be completed by December 2018 and all actions completed by 2030

i. Afforestation/ reforestation in degraded and attrition areas. All actions to be completed by 2030

j. Controlling of erosion through suitable bio-engineering techniques. Actions to be completed by 2030

k. Training and capacity building programmes for existing man-power as well as communities

l. Enhancing quality and quantity of man-power within the state machinery to facilitate better implementation of actions

m. Study of value of the ecosystem services along with change monitoring to be initiated by June 2018

G. Biodiversity Conservation, Preventing Biodiversity Loss & Wildlife Management

Richness in biological diversity is a unique attribute of the state's natural resource base and is fundamental to its economic development. Assam is known for its unique flora and fauna, agricultural crop varieties and their wild counterparts, which contribute significantly to the economy of the state. These rich biological resources need conservation from depletion under many natural and man-made drivers. The main interventions to achieve these objectives are enumerated below.

i. **Biodiversity Conservation and Management.** In view of the importance of this subject for Assam, the Government has adopted 12 targets and detailed actions with timelines for each. Monitoring of these targets will be done through the indicators stated in Appendix 7.1 of this chapter for which baselines and intermediate and final targets will be set up by 2018.

Target 1: By 2030, the majority of the state's population, at least 75% of the youth, is aware of the values of biodiversity, and the steps they can take to conserve and use it sustainably. Actions to be taken are:

a. Enhance environmental awareness and values of biodiversity especially among youth

b. Mainstream environmental education and conservation awareness in the state education policy

c. Build capacity of educational and training institutes for environmental education and advocacy

Target 2: By 2020, values of biodiversity are integrated in state planning processes, development and poverty alleviation programmes. Actions to be taken are:

a. Set up an institutional mechanism for valuation of biodiversity and ecosystem services
b. Build capacity for valuation of biodiversity and ecosystem services
c. Mainstream biodiversity conservation and ecosystem management into environmental policy, legislations and development plans
d. Engage poorest sections of the society in conservation / forestry projects

Target 3: Strategies for reducing rate of degradation, fragmentation and loss of all natural habitats are developed by 31 December 2019, and actions put in place by 2030 for environmental amelioration and human well-being. Actions to be taken are:

a. Map biodiversity rich habitats and ecologically sensitive sites
b. Identify major drivers or causes of environmental degradation
c. Reduce the rate of habitat degradation, loss and fragmentation
d. Address the major causes of habitat loss and environmental degradation
e. Improve density of cover in degraded forest areas
f. Improve Protected Area Management – control invasive species; enrichment planting, micro-ecosystem improvement
g. Create gene banks (2 central facilities and 35 site banks) for threatened indigenous biodiverse species (ex-situ)
h. Prevent forest fires specially in hill areas - create 2 central monitoring units and 20 field stations
i. Undertake policy reviews and develop policies by December 2019 to address gaps in the State's policies regarding forests, bamboo & cane, wetlands, and ecotourism in climate change context

Target 4: Terrestrial, inland aquatic, wetland ecosystems, and associated species are conserved effectively and equitably by 2030, with specific emphasis on climate change effects and adaptations. Actions are:

a. Strengthen conservation programs for state wetlands, rivers and aquatic species.
b. Assess impacts of climate change on biodiversity & ecosystems.
c. Strengthen climate change adaptation measures.
d. Enhance management effectiveness of the Protected Areas and community forests.
e. Establish sustainable financing measures for the Protected Areas.
f. Assess the status of prioritized taxonomic groups and species and the factors affecting them.
g. Strengthen conservation programs for prioritized species.

Target 5: By 2030, ecosystem services, especially those related to water, human health, livelihood and wellbeing, are enumerated and measures to safeguard them are identified, considering the need of women and local communities, particularly poor and vulnerable sections. Actions to be taken are:

a. Monitor and assess every three years key ecosystem services, their flow and use by various groups

b. Safeguard health of key ecosystems to sustain ecosystem services

Target 6: By 2020, invasive alien species and their pathways are identified and strategies to manage them developed so that populations of prioritized invasive alien species are managed. Actions to be taken are:

a. Improve understanding on invasive alien species and native species with high invasive potential.
b. Identify invasive species pathways and changes in areas affected by invasive alien species
c. Develop and implement measures to protect natural and agriculture ecosystems against invasive alien species.

Target 7: By 2020, measures are adopted for sustainable management of agriculture, forestry and fisheries. Actions to be taken are:

a. Strengthen information base, institutional and technical capacity for conservation and sustainable utilization of fish and aquatic biodiversity.
b. Identify threats to aquatic life and fish biodiversity and take steps to ameliorate them.
c. Improve management of private forests, state forests, and village forests for sustainable production of goods and services.
d. Strengthen good governance for sustainable management of forests.
e. Promote sustainable agricultural practices that ensure conservation of biological diversity.
f. Major pollutants affecting environment are maintained per national environmental standards.
g. Strengthen research and technical capacity for documenting, monitoring and assessing impacts of major pollutants.

Target 8: By 2019, strategies are developed and implemented for minimizing genetic erosion and safeguarding genetic diversity in the state. By 2030, genetic diversity of cultivated plants, domestic livestock, & their wild relatives, including other socio- economically as well as culturally vulnerable species is fully achieved. Actions to be taken are:

a. Grading of local cattle and buffalo stock with suitable thermal resistant high milk yielding Indian indigenous varieties such as Murrah / Sahiwal through artificial insemination – cover at least 13 districts of Assam, including remote districts
b. Create gene bank for conservation of threatened plant species, breeds
c. Strengthen national capacities in documentation and management of agro-biodiversity conservation and sustainable utilization.
d. Strengthen disease diagnostic-disease forecasting system

Target 9: By 2020, national initiatives are all adopted by the state and strengthened using communities' 'traditional knowledge" relating to biodiversity, with a view to protecting this knowledge in accordance with national legislations and international obligations. Actions to be taken are:

a. Promote Traditional Knowledge (TK) and Customary Practices relevant to biodiversity conservation and sustainable use.

b. Build state capacities for the protection, preservation and utilization of TK and Customary Practices relevant to biodiversity conservation and sustainable use.

c.   Document and promote bio-cultural services.

d.   Prevent destruction and degradation of bio-cultural heritage sites.

Target 10: By 2020, Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Utilization as per the Nagoya Protocol are operational, consistent with national legislations. Actions to be taken are:

a. Develop a state policy and legal framework for the implementation of the Access and Benefit Sharing Policy.

b. Strengthen the implementation of a fair and equitable ABS model.

c. Implement strict control mechanisms on bio-resource and genetic resource piracy.

Target 11: By 2019, an effective, participatory and updated State Biodiversity Action Plan is made operational at state level, with incentives for biodiversity conservation, abolition of incentives which harm biodiversity, and involvement of all stakeholders in preparing and implementing the state BSAP. Actions to be taken are:

a. Reform incentives affecting biodiversity negatively.

b. Strengthen incentives promoting conservation and sustainable use of biodiversity.

c. Develop guidelines and policy for environmental amelioration and human well-being.

d. Strengthen science-based management of natural resources.

e. Promote sustainable use and consumption of natural resources.

f. Strengthen capacity in natural resources management e.g. medicinal plants, NTFP, wild edible plants, plants of traditional use.

Target 12: By 2019, opportunities to increase the availability of financial, human and technical resources to facilitate effective implementation of the Strategic Plan for Biodiversity and the state targets are identified and the Strategy for Resource Mobilization is adopted. Actions to be taken are:

a. Promote transfer and adoption of technologies related to biodiversity management.

b. Strengthen institutional mechanisms and good governance to coordinate fund mobilization for Assam state BSAP implementation.

c. Mobilize financial resources to support implementation of the Assam state BSAP.

d. Mainstreaming of biodiversity conservation and sustainable development.

ii.   **Wildlife and population dynamics management.** Assam is rich in wildlife. Currently the State has about 5% of its geographical area under the Protected Areas Network. There are 5 National Parks[12] and 18 Wildlife Sanctuaries.[13]. The State boasts 4 Tiger Reserves,[14] 2 UNESCO

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[12]*Kaziranga, Manas, Nameri, Orang & Dibu-Saikhowa*

[13]*Amchong, Burachapori, Barnadi, Barail, Borjan-Bherjan-Pdumoni, Chakrasila, Deepor Beel, Dehing Patkai, East Karbi Anglong Garampani, Hollongapar, Laokhowa, Marat Longri, Nambor, Nambor-doigrung, Panidehing   Pobitora and Sonai Rupai*

[14]*Kaziranga, Manas, Nameri and Orang*

World Heritage Sites,[15] and 2 Biosphere Reserves.[16] Assam is known world over for the Rhinoceros unicorns, the Greater One Horned Rhino of which almost 78% of the population is found in the State. Other major endangered mammals include tiger and Asiatic elephant (protected under Project Tiger and Project Elephant respectively), Asiatic wild buffalo, Eastern Swamp Deer, Pygmy Hog, Hispid Hare, Golden langur, and Hoolock Gibbon. In addition, there are many endangered and vulnerable avifauna, herpetofauna, Pisces and butterflies. Further actions to be taken are:

a. Develop two additional wildlife sanctuaries namely North Karbi Anglong and Bordaibam Bilmukh Bird Sanctuary by 2020.

b. Start Project Rhino by 2019 which will cover the entire gamut of conservation including protection, anti-poaching measures, translocation, habitat extension and management.

c. Monitor all key species (currently only tiger, elephant and rhino are monitored) using latest scientific methods by 2020. Gain information about species behavior, especially range and migration patterns, by telemetry and tracking.

d. A Research Grant Fund (RGF) in Forestry and Wildlife shall be established by 2020 to carry out research activities.

e. Expand by 2020 wildlife rescue and rehabilitation capacity of the Forest Department following floods and other natural disasters. Strengthen the capacity in the state of the Centre for Wildlife Rehabilitation and Conservation under WTI to handle large mature mammals such as elephants and rhinos during distress and provide adequate stocks of drugs.

iii. **Habitat extension, improvement and prevention of human-wildlife conflicts.** Degradation of wildlife habitats and their fragmentation due to immense anthropogenic and biotic pressure has started, impacting wildlife and aggravating human-animal conflict. Most wildlife corridors have suffered significantly, mostly in unprotected forests (unclassed state forests, tea gardens, government land, wetlands and VGR/PGR) prone to large scale encroachment; construction of non-wildlife friendly structures such as road and rail; and allotment of wastelands to industries and tea and rubber plantations without any consideration for wildlife. Another menace is habitat degradation through invasion of obnoxious weeds, and contamination of surface and ground water from inorganic fertilizer use in contiguous areas. Consequently, food for wildlife has dwindled forcing them to venture outside habitats. Actions proposed are:

a. Forest Department will prepare and begin implementation by December 2018 of a scheme of habitat extension, improvement and management.

b. By 2025, all wildlife corridors shall be restored to their original status, by awarding attractive compensation packages if necessary to the settlers on these tracts.

c. A scheme will be adopted by December 2018 for eliminating adverse impacts of animal-human conflicts. The scheme will include (i) replacing an appropriate proportion of large teak plantations in forest areas by mixed species of local fruit varieties for use by villagers affected by animal-human conflicts; (ii) providing villagers near the fringes of wildlife areas with adequate compensations through crop insurance; (iii) helping such villagers in the

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[15] *Kaziranga and Manas*
[16] *Manas and Dibru Saikhowa*

fringes of forests to modify their housing structures to secure them against damages to life and property.

H.   Land Management, Soil Conservation & Watershed Development

Changing land use patterns and specifically the unsustainable ways of utilizing land have put significant pressure on the limited land resources of the state. Being agrarian, availability of fertile land is of crucial importance to Assam. Of the state's total land area over 20% is either lying waste due to water logging or marshy conditions, or degraded or flood prone. In 2011, a total of 8778.01 Sq. Km area of the state has been identified as wastelands, which includes various categories of land like – land with dense or open scrub, water logged areas, *jhum* and abandoned *jhum* areas, scrub forest etc. Further, about 1519 sq. km area comes under potential water bodies, which has been designated as wastelands. A significant portion of the state's land area adjoining streams and rivers also suffers from bank erosion.

The major causes behind degradation of land in the state include (a) illegal and unsustainable removal of natural resources, (b) illegal occupation or encroachment of the wasteland areas with no consideration for management, (c) injudicious application of fertilizers, (d) extraction of ground waters without considering the potential for rejuvenation, (e) massive sandcasting as a result of altered river regime in flood prone areas of the state, (f) lack of specific and clear-cut ownership rights over the wasteland areas, (g) absence of adequate governmental strategy towards utilization of the land, and (h) pollution, encroachment and mismanagement of the wetland areas.   Keeping these issues in view, the state plans to restore these areas to productive use by 2030. However, two major constraints need to be overcome: encroachments, which cover a significant portion of the degraded lands; and lack of awareness among the rural population and communities about the importance of soil conservation. The major interventions that will be adopted to rectify these problems are discussed below.

i.   **Greening the non-forest degraded lands.** Afforestation of degraded lands with suitable and economic species can help in restoration of such lands as well as increasing livelihood options. Bamboo, cane and such other high valued plants can be grown in degraded lands according to the suitability. These areas can be allowed to be managed by community organizations, societies etc. with suitable value chain development. The actions to be taken are:

a. Identification and mapping of all such land will be completed by December 2018 and scheme for afforestation by suitable specifies developed by March 2019.
b. Greening will be completed by 2030.

i.   **Developing soil and water conservation regime.** Land degradation, soil and water conservation are very closely linked to each other. Land use patterns and soil erosion impact water levels within the soil strata; while water conservation helps prevent soil degradation. Thus, integrated approaches will be employed to prevent land degradation and conserve soil and water resources. The major actions to be taken are:

a. *Managing Soil Fertility.* The productivity of the soil will be improved by ensuring that all farmers test their soil and apply optimal quantities and proportions of fertilizers and nutrients. Arbitrary application leads to nutrients being wasted, raising costs of cultivation, and polluting ground and surface water. The government will distribute soil health cards (SHCs) to increase the coverage of farmers from 33% of requirements currently (272,000 cards) to 100% by 2019-20; and increase and upgrade soil testing laboratories from 10 currently to 15 by 2019-20 and 26 by 2023-24. Greater use of organic manures and bio-fertilizers will also be emphasized.

b. *Conserving Ground Water.* Ground water depletion, rampant over much of the state, results in land degradation. Increasing use of tube-wells (shallow and deep) for irrigation; altered pattern of rainfall; and falling water levels in river basins has led to depletion of the ground water table in lower Assam districts. This process will be halted by 2025 by promoting rain water harvesting through farm ponds and community ponds; encouraging adoption of traditional irrigation techniques like dong; rejuvenation of wetlands; and greater emphasis on use of surface water which is available in plenty for irrigation, instead of ground water.

c. *Improving Agricultural Technology.* The Government will actively promote techniques like mulching and cover cropping which help in soil as well as water conservation and contribute to higher farm productivity. By 2025 all farmers in the state will be made aware these techniques and at least 50% encouraged to adopt them.

d. *Arrest Gulley Control Erosion.* The soil conservation department will arrest all gulley erosion in the state by 2025 through measures like check dams and spillways.

e. *Treat micro water sheds for soil and water conservation* (16000 ha) by 2030 in hilly Jhum areas.

iii. **Conservation and management of *beels*.** Assam has over 1000 floodplain wetlands or *beels*, which are vital for water conservation and preventing land degradation. However, faulty management, encroachment and rampant pollution, mostly due to waste dumping have led to their degradation. Actions for conservation and rejuvenation of the *beels* include:

a. *Enacting Wetland Regulation and Management Act.* Though Assam has a Wetland Act, lack of regulation has led to continued misuse of *beels* and wetlands. So, new legislation to establish a regulatory framework will be enacted by December 2018 to set up standard operating procedures to remove encroachments, sustainably extract and manage wetland resources, and control pollution.

b. *Encourage Public-Private Partnerships and Community Based Management of Wetland Resources.* Such partnerships and community involvement in wetland management are essential for successful rejuvenation of degraded *beels*, utilizing them for aquaculture and other sustainable extraction of aquatic products; and livelihood generation for community's dependent on them. All such wetland will be covered through such partnerships by 2025.

iv. **Community Reserves.** To better utilize degraded areas, the Forest Department will bring all community reserves under a registered Community Reserve Management Authority and adopt

appropriate strategies to ensure the right of the communities for sustainable extraction of the resources from them. The Department will designate at least 75% of community reserves under such Authority by 2030. Other actions that will be taken include:

a. Mapping all the degraded and wasteland areas of the state by the Revenue Department using remote sensing technologies available with ARSAC under the S & T department by December 2018.

b. Establishment of Village Level Management & Conservation Committees (VLMCC) and bestowing rights for protection, conservation, development and use of existing wastelands (owned by government) as **community forest/beel** for agro forestry, horticulture, fishery, sericulture, fodder development by December 2020.

c. Changing policy framework for conferring statutory rights to the VLMCCs for utilization of the resources from community reserves or beels by December 2020.

d. Preparation/Development of land use plan by the VLMCCs for all the wastelands under their jurisdiction with adequate technical help from the Govt. Departments and NGOs by December 2021.

e. Rejuvenation of *beels* and development of public-private partnership based fishery activities with indigenous fish population. Rejuvenation completed of all *beels* in state by 2030.

f. Development of Wetland Regulatory Framework to allow sustainable management of wetland resources, reduction of pollution and control of encroachment by December 2018.

g. Promotion of surface water irrigation techniques over ground water dependent irrigation, rain water harvesting in agricultural fields, mulching and cover cropping with all cultivated areas covered by 2030.

I. Water and river conservation and management.

Rivers, with the mighty Brahmaputra and Barak as key resources, are the lifeline of Assam. However, every year, the monsoons bring devastating floods wreaking havoc on the state's economy and development. River bank erosion, affecting considerable area under crops and dwelling land every year is also is a major concern for the riverine population. To address these problems, the Government will intervene in the following four major areas:

I. **Stopping river bank erosion.** Arresting river bank erosion through river bank stabilization and river bank training is critical. The actions that will be taken are:

a. Vulnerability mapping of erosion prone areas to be completed by 30 September 2020.

b. Detailed studies to understand sediment dynamics of the Brahmaputra and its tributaries and its impact on river bank erosion to be completed by 30 September 2020.

c. Studies to understand riverbank erosion processes and finding out solutions based on best available and appropriate techniques to be completed by 30 September 2020.

d. Detailed hydraulic, hydrological and geotechnical slope stability analyses of eroding banks to be completed by 30 September 2020.

e. Adopt new and innovative technology to arrest bank erosion and development of a hybrid technology combining both soft and hard engineering for erosion control. Begin identifying

and development by 31 March 2018 and implement gradually completing all major erosion points by 2030.

f. Scoping studies of bio-engineering solutions will be conducted, alone or in combination with other engineering solutions on a continuous basis. The first of such studies to be contracted by December 2018.

g. Detailed impact assessment studies will be conducted and their findings used as inputs before implementation of any hardcore engineering interventions.

h. A comprehensive management approach will be adopted of all catchment areas. The institutional arrangements for such an approach will be set up by December 2018.

ii. Stopping erosion of Kaziranga National Park. The Park is losing virgin natural forests due to massive erosion by Brahmaputra at different locations. To prevent this, feasible and sustainable engineering (both hard and soft) solutions should be developed backed by R&D. Steps that will be taken include:

a. Pilot studies on best practices will be initiated by December 2018 and replication of suitable interventions following analysis and evaluation will be completed by 2021.

b. Bio-engineering techniques and afforestation with ecologically suitable species will be adopted on priority basis for the attrition areas. The process will begin in 2018-19.

c. Adequate measures will be taken to conserve and protect various streams, rivers and rivulets from the Kaziranga National Park watershed areas, which connects with the River Brahmaputra, to maintain the natural water regime within the KNP ecosystem. The process will begin by December 2018 and protection measures completed within thefollowing 3 years.

d. A project to raise, strengthen and retrofit the existing embankment system towards the eastern boundary of the KNP, which protects the park during high flood will be begun on priority by December 2018 and completed within 3 years after initiation.

iii. River conservation & desilting. Siltation is a major concern for the river systems in the state, which reduces the depth of the riverbed, reducing its water holding capacity and increasing risk of flooding of riverine areas. Protection and conservation of the river ecosystem as well as the surface water resources like wetland are also of prime importance, impacting significantly on sustainable livelihoods, agriculture and other resources of the state. The natural water channels and their inter-connectivity is critical for the flood plain eco-systems. Major interventions to be adopted include:

a. Developing inventory of the existing wetlands in the state and connecting channels based on present and historical data by 31 March 2019.

b. Conservation of all wetlands and connecting channels through demarcation, removal of encroachments, de-siltation, weed removal etc. Action to be continuous beginning 2018-19.

c. De-siltation of rivers and restoration of natural flow regime on a continuous basis beginning 2018-19 for preventing localized floods.

d. Identification of point and non-point sources of pollution of all surface water bodies and prevention and mitigation thereof on a continuous basis beginning 2018-19.

e. Freshwater fish and other aquatic biota conservation through habitat restoration in selected stretches of the Brahmaputra and its tributaries on a continuous basis beginning 2018-19. Declaration of aquatic bio-diversity conservation zones by December 2018.

f. Promotion aqua based livelihood projects in the wetlands instead of converting them for any other land use on a continuous basis beginning 2018-19.

iv. Flood protection & prevention of floods. Flooding is an annual catastrophe for Assam. In 2017 the state witnessed three massive waves of flood, unprecedented in magnitude and impact. Gradual change in the rainfall pattern of the region, along with other factors have raised the intensity of disaster caused by floods. The flood prone area of the state is 31,500.00 sq. km accounting for 39.58 % of its total land area,[17] and floods cause economic losses of about Rs. 200 crores annually. To halt the increasing trend of population affected by floods and to bring about substantial prevention of large scale floods by 2030, the Government will take the following measures:

a. Undertake a detailed scientific study to be initiated by December 2018 to understand the nature of river flow and its impact on erosion to control it and enable land reclamation.

b. Undertake a study to be initiated by December 2018 to assess intensity and frequency of floods due to climate change and extent and depth of flooding in 14 major Urban agglomerates in the 14 districts prone to floods.

c. Selective flood plain zoning for minimizing the impact of flood and adoption by December 2018 of necessary policy reforms for the same.

d. Generation of DEM/DTM of the entire flood plain using latest technologies like LiDAR and integrating the same in hydrodynamic models suitable for the river systems in Assam and development of efficient Decision Support System for flood management based on such models by 31 March 2020.

e. Increasing sustainability and maintainability of the existing embankments and by raising, strengthening and/or retrofitting wherever necessary on a continuous basis beginning 2018-19.

f. Use of alternatives materials, suitable admixtures will be explored to stabilize embankments.

g. Conversion of embankments to road cum embankment for improving their maintenance and sustainability and usability. All to be completed by 2023.

h. Interlinking of rivulets and tributaries will be explored for flood moderation, irrigation and other water based industries. A study for this purpose will be initiated by December 2018.

i. Small and micro hydel projects with some flood storage at piedmont areas throughout the flood plain will be promoted on a continuous basis.

j. Advanced flood forecasting models for the flood plains of the Brahmaputra and Barak involving communities' human resources will be developed by December 2018, considering the insufficiency of the existing flood forecasting mechanism.

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[17] *Economic Survey, 2016-17*

k. Develop and adopt specific city flood management action plan for building climate resilient urban areas. Pilot studies on prioritized cities/town will be initiated by December 2018.

l. Assimilation and adaptation of best practices from similar river basins across the world for minimizing riverbank erosion and flood management is necessary and the process to identify such best practices will begin by 2018-19.

m. Structural and policy reforms to increase coordination among the stakeholder departments and adoption of holistic approach based on IWRM framework will be initiated in 2018-19.

n. A North-East Hydrology Data Management Centre through basin management approach for managing flash floods will be established by 31 December 2018.

o. Construction of multipurpose flood shelters with inmate capacity of 500 people / unit in Dhemaji, Lakhimpur, Barpeta; Morigaon & Majuli in Jorhat will be initiated by 31 December 2018 and completed in phases by 31 March 2020.

4. Partnerships

Achieving sustainable development goals will require major partnership efforts which the Government will engage in and promote actively. The key stakeholders who will be involved are:

a. *Government Departments.* The government will break existing silos and build inter – departmental collaborations across key stakeholder departments to implement identified actions.

b. *Private sector, local governments and communities.* The Government will engage private sector associations and seek their active support through PPP and other arrangements to implement the actions indicated in this chapter. Municipalities and Panchayati Raj Institutions will also be asked to take responsibilities in their areas. Community involvement in design, implementation and feedback on public schemes and projects is essential and will form key components in them.

c. *International and national development agencies.* The government will engage with national and international development agencies to address gaps in expertise and funds.

d. *Technical institutes and academic institutions* will be partnered with for R&D, undertaking studies, and necessary capacity building of government officials.

5. Technology and innovation

As discussed under each of the sections A to D above, incorporation of new technology and innovative approaches and practices is key to success of the environment and climate change goals of the SDGs. One of the important international understandings under the SDGs (enshrined specifically under SDG 17) is cooperation in technology transfers from developed to developing countries. While such transfers will essentially be facilitated by the Central Government and passed on to states, the State Government will remain alert to new technology development globally and nationally and take steps to acquire and adapt them to local conditions. Similarly, it will identify and actively promote innovations and best practices in technology, policy, institutions, organization etc. available globally and nationally. The Forest Department will coordinate

adoption of all such technology and innovation across all concerned Departments and with the Technology and Innovation Centre in Assam Administrative Staff College. To handle all matters concerning technology, innovation, R&D and studies, it will establish a Knowledge, Innovation and Technology Cell with adequate capacity by December 2018.

6.   Resource requirements

Attaining the vision of Assam 2030 requires "back-casting" the implications of the vision of the state in 2030 from targeted outcomes to required physical outputs, inputs, activities, and resources both human and financial to achieve them. This is the essence of this long-term strategic exercise.

i. *Financial resources.* The required expenditures based on the strategies and actions developed to achieve the environment and climate related SDGs 12, 13, 14 and 15 is reflected in the financial planning exercise in chapter 9. Only expenditures of departments primarily connected these SDG Goals have been included to avoid double counting. All departments show gaps in financial resources available. The total cumulative gap in the years 2017-19 for the Departments is shown in the Chapter 9.

ii. *Human resources.* The realization of Assam 2030 requires a very major scaling up of effort from current levels. Both the quantity as well as quality of services provided by the public sector must improve. There will be requirement of more staff to provide public services. Therefore a detailed human resource strategy needs to be undertaken within each department concerned with SDGs 12, 13, 14 and 15 focusing on (a) a thorough review of all positions as to their utility; (b) filling up vacancies of those that are critical speedily; (c) rationalization of existing personnel and redeployment if necessary; (d) considering outsourcing if specialized private sector entities can provide services better; (v) working out a net requirement of additional critical staff. Such an exercise must be completed by December 2018.

7. Coordination arrangements for Goals 12, 13, 14 and 15.

Goals	Lead Departments	Supporting Departments		Cross Cutting Departments
Goal 12 Responsible Consumption and production	Power (expansion of renewable energy and energy conservation)	Environment & Forests (green production and consumption; pollution control and promotion of recycling); Cooperation (cold chains and food waste prevention etc.)	Food and Civil Supplies (reduce food waste), Mines & Minerals (environmentally friendly and sustainable extraction, (Industries & Commerce (reduction of pollutants and emissions), Tourism (sustainable Tourism)	Social Welfare (Gender), WPT & BC, Tea Tribes Welfare, Minority Development, Char Areas, Hill Areas, Science & Technology, Information Technology, Information & Publicity.
Goal 13 Climate action	Environment & Forests	Revenue & Disaster Management (for disaster risk preparedness) Agriculture (Adapting farming practices to drought and flooding <u>and</u> agricultural crop insurance) Water Resources Department (strengthening embankments against increased floods) Irrigation (expanding irrigation for reducing risk of droughts)	Education (Environment awareness raising)	Transformation and Development, Finance Department (Oversight)
Goal 14 Life Below Water	Water Resources	Environment & Forests, Fisheries		
Goal 15 Life on land	Environment & Forests	Soil Conservation, Water Resources,		

Appendix 7.1. Indicator Set for Bio-diversity Conservation, Preventing Biodiversity Loss, and Wildlife Management (Section 3 G).
(Baseline and target values will be finalized by 31 December 2017.)

Target 1: By 2030, a significant proportion of the state's population, especially the youth, is aware of the values of biodiversity, and the steps they can take to conserve and use it sustainably.

Indicators: Trend in:
- Number of students taking biodiversity and environment courses at higher education.
- Number of schools enrolled in the National Environment Awareness Campaigns.
- Number of government financed projects related to biodiversity and conservation.
- Visit to Protected Areas, natural history museums, exhibitions and zoological/botanical gardens.
- Number of Biodiversity Management Committees (BMCs) constituted/operationalized.
- Number of people's biodiversity registers (PBRs) prepared.

Target 2: By 2030, values of biodiversity are integrated in state planning processes, development programmes and poverty alleviation programmes.

Indicators: Trend in:
- Number and effectiveness of measures developed in the MGNREGA and Integrated Watershed Management Programme.
- Number and coverage of studies related to biodiversity.
- Capacity building for valuation of biodiversity.
- Reflection of biodiversity and ecosystem services in policy decisions, planning and reporting processes.
- Engagement of marginal farmers, communities involved in eco-restoration and conservation programs.

Target 3: Strategies for reducing rate of degradation, fragmentation and loss of all natural habitats are developed and actions put in place by 2030 for environmental amelioration and human well-being.

Indicators: Changes in:
- Proportion of forest cover in different forest categories.
- Areas under riverine ecosystems and wetlands
- Water quality and water flow.

- Status of selected indicator species (Rhino, elephants, gibbons etc).
    Also, Trend in:
- Afforestation and Assisted Natural Regeneration.
- Slash and burn agriculture.
- Soil health records
- Awarded titles under FRA in forest areas.

Target 4: Terrestrial & inland aquatic &wetland ecosystems & associated species are conserved effectively & equitably, with specific emphasis on climate change effects and adaptations.

Indicators: Change in-

- Number / area / percentage of PAs, CCAs and Biodiversity Heritage Sites.
- Area and ecological status of wetland through implementation of integrated management plans.
- Abundance and diversity of water bird species in wetlands over time.

Trends in-

- Biological corridors legally recognized as community reserves, conservation reserves.
- Pollution status of wetlands of international importance, national and state importance
- Identification of state critical endangered species.
- Biodiversity-inclusive climate change adaptation and mitigation measures formulated /implemented.
- Population trend of selected species.
- Status and trend of ambient air quality; water quality, noise levels.

Target 5: By 2030, ecosystem services, especially those related to water, human health, livelihood and wellbeing, are enumerated and measures to safeguard them are identified, considering the need of women and local communities, particularly poor and vulnerable sections.

Indicators: Trend in:

- Number of people with access to primary/secondary education/health services/safe drinking water / electricity / Road connectivity.

- Number of people with access to potable water, number of households with tap water connections.
- Ecosystem services from PAs, community forests etc.
- Conservation measures undertaken to protect critical ecosystems and its services.

Target 6: By 2030, invasive alien species & their pathways are identified and strategies to manage them developed so that populations of prioritized invasive alien species are managed.

Indicators:
- Trend in baseline creation of invasive alien species spread and extent in each districts of the state
- Number and coverage of management plans developed for prioritized invasive species and
- Integration with PA management plans and wetland management plans.
- Change in area affected by invasive species.

Target 7: By 2030, measures are adopted for sustainable management of agriculture, forestry and fisheries.

Indicators: Trend in:
- Area under jhum cultivation, trend in jhum cycles.
- Usage of agrochemical fertilizers.
- Increased acreage under crop production (organic/inorganic).
- Use of bio-fertilizers, bio-fuels, organic manure and vermicomposting.
- Proportion of products derived from sustainable sources.
- Over exploitative inland fishing.
- Traditional fishing practices.

Target 8: By 2030, genetic diversity of cultivated plants, domestic livestock, & their wild relatives, including other socio- economically as well as culturally vulnerable species is maintained, and strategies are developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Indicators:
- Trend in number of indigenous/domesticated breeds/crop varieties (in situ)
- Trend in germ-plasm accessions in ex-situ collection (crops and breeds).
- Effectiveness of initiatives/measures taken to conserve indigenous animal varieties and indigenous crop varieties.

Target 9: By 2030, national initiatives using communities 'traditional knowledge" relating to biodiversity are strengthened, with the view to protecting this knowledge in accordance with national legislations and international obligations.

Indicators:
- Number of-
  - Traditional herbal formulations and traditional medicines documented.
  - Potential 'bio-piracy' / wrong patents cases prevented.
  - patents and ABS based on TK derived from folk knowledge.
- Training / Capacity building at local and community levels.
  - BMCs and PRI institutions trained.
- Trends in-
  - Collection of plants providing raw drugs used in Indian system of medicine.
  - Incentive schemes for sustenance of cultural heritage like arts and crafts and festivals.
- Documentation and awareness meetings/ capacity building / workshops / conferences for various target groups.

Target 10: By 2020, Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Utilization as per the Nagoya Protocol are operational, consistent with national legislations.

Indicators:
- Trend in number of proposals for intellectual property rights.
- Trends in number of cases for seeking prior approval of ASBB for transferring the results of research to companies for commercial purposes.
- Trends in number of cases for seeking approval of bio-resources and associated traditional knowledge for commercial utilization.
- Trend in cases related to bio-piracy reported by communities & Forest Dept.

Target 11: By 2030, an effective, participatory and updated State Biodiversity Action Plan is made operational at state level, with incentives for biodiversity conservation, abolition of incentives which harm biodiversity, and involvement of all stakeholders in preparing and implementing the state BSAP.

Indicators: Trend in –
- Formulation and implementation of policies suggested in ABSAP
- ABSAP actions integrated into relevant sectoral plans & programs

- Capacity enhancement training given to policy makers, communities, office bearers in govt depts.
- Capacity enhancement training to teachers, students, educational institution for promotion of natural resource management and research.

Target 12: By 2030, opportunities to increase the availability of financial, human and technical resources to facilitate effective implementation of the Strategic Plan for Biodiversity and the state targets are identified and the Strategy for Resource Mobilization is adopted.

Indicators: Trend in
- Financial resources made available for implementing Aichi and Biodiversity Targets.
- Human resource made available for implementing Aichi and State Biodiversity Targets.
- Technical resources made available for implementing State Biodiversity Targets.
- Assessment of gaps in biodiversity finance.
- Innovative finance mechanisms utilized for implementation of ABSAP.

Chapter 8: Peace, Justice, Good Governance and Strong Institutions

Goal 16: Promote peaceful, inclusive societies for sustainable development; provide access to justice for all; build effective, accountable and inclusive institutions at all levels in Assam by 2030

Chapter 8: Peace, Justice, Good Governance and Strong Institutions

Goal 16: Promote peaceful, inclusive societies for sustainable development; provide access to justice for all; build effective, accountable and inclusive institutions at all levels in Assam by 2030

1.   Introduction.

Assam envisions a peaceful and inclusive society by 2030, with access to justice for all including the poorest of the poor; high standards of governance with active community participation; and strengthened judicial and administrative institutions for achieving the Sustainable Development Goals (SDGs). Achieving Goal 16 objectives are essential for catalyzing economic growth and fostering a conducive investment climate, and ensuring social and environmental development which Assam, in line with the SDGs, aspires to achieve.

This chapter of the Assam Development Agenda 2030 discusses the Sustainable Development Goals (SDGs) 16 as adopted by Assam[18] and lays out a road map for achieving them. Particular attention is focused on access to justice for all; providing the populace a sense of security and confidence; reducing all forms of violence and related deaths; ending abuse, exploitation, trafficking and violence against children, girls and women; promoting the rule of law; bringing about substantial reduction in bribery in all forms; developing accountable and transparent institutions; and ensuring responsive, inclusive and participatory decision making at all levels.

2.   Goals and targets.

The key indicators selected for monitoring SDG Goal 16 are given in Table 1 below. These include indicators on crime (where given Assam's history of combating insurgency and other categories of violent crime, it currently has amongst the highest rates of violent crime in the country[19]); access to justice; and corruption. These indicators are chosen based on availability of data. Apart from the Home Department, several other departments and state agencies are also involved critically in meeting the objectives of Goal 16 and these include

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[18]*Assam 2030: Our Dream, Our Commitment. Vision and Strategic Architecture Document of the Government of Assam. Guwahati, 12 July 2016.*

[19]*According to National Crime Record Bureau's report, Crime in India 2012, the highest rate of violent crimes was reported from Assam (54.2 per cent), followed by Manipur (44.6 per cent), Kerala (42.7 per cent) and Delhi (34.7 per cent). The all-India average is 22.7 per cent. While by 2015-16 Assam's violent crime rate had fallen to 47.1 per lakh population, it was still much higher than the all-India average of 26.7 in that year.*

Departments of Law and Justice, Social Welfare, Police, Jails, Office of State Chief Information Commissioner, etc. Going forward, the set of indicators will be improved and expanded supported by such departments and agencies reflecting better in due course the State's priorities for this critical Goal 16.

Table8.1. Indicators: Baselines and Targets for Goal 16

Indicators	Baseline (2015-16)	Target (2018-19)	Target (2022-23)	Target (2030-31)
Rate of violent crime (all forms combined in the state per lakh population)	47.1 (26.7*)	35	25	15
Rate of crime (all forms combined) against women in the state per lakh population)	113.93	80	52.24*	30
Violence related deaths per lakh population (annual)	4.2 (2.55*)	3.00	2.00	1.5
Number of victims of human trafficking per lakh population	4.6 (0.5*)	3.00	2.00	1.5
Crime against children (all forms combined) per lakh children	23.8 (21.1*)	22.00	21.1	20.2
Cases reported of crime in the state per lakh population)	321.8	319.7	315.2	308.00
Percentage of cases charge sheeted in Assam	47 (77.7*)	55	77	85
Pendency of trials of IPC cases at Courts (%)	83.9 (85.8*)	80	78	73
Percent of inmates received vocational training (10.3)	8.05	14	38	100
Percent of Jails under CCTV systems.	0	48.38	100	
Percent of Jails under e-Prison projects	0	77.4	100	
Percent of Jails which have e-Court facility	0	48.38	100	

Percent of UTPs out of total prison population	62.0**	45.0	31.0	15.0

Note: *Figures in parenthesis indicate the present national average of overall rate of crime per lakh population. ** As on 14.08.2017

Source: SPAP Home & Political Department

3. Major strategic interventions proposed

The major strategic interventions proposed to achieve SDG Goal 16 are broadly categorized under four broad priority groups A to D described in detail below.

A. Improvement of security, reduction in crime, and preventive policing

One of the highest of the state's priorities is to maintain law and order, as it is one of the primary pre-conditions for the welfare of citizens and for overall economic development of the state. Various economic and social indicators have shown a great improvement over the past decade as insurgency within the state and in the entire North-east region has declined. In order to further improve security and reduce crime the State Government will undertake the following interventions.

i. **Ensure effective policing with adequate personnel and infrastructure:** The state will remedy the current gaps in personnel and infrastructure of the police department and investigating agencies. Currently the Assam Police has a sanctioned strength of nearly 75000 officers and policemen and women. However, over 17 percent of these positions remain unfilled. The sanctioned strength is also lower than national and international norms. The ratio of sanctioned police personnel per lakh population in Assam is 173 against the national average of 180.6 and United Nations norm of 222. As far as infrastructure is concerned, there is a dearth of police stations (PS) and outposts (OP) in the state, which is restricting the expansion of police services at the last mile, and adversely affecting service delivery to the populace. Against the norms of one police station per 200 square kilometers in rural areas, the current number in Assam is 346. In order to overcome these gaps, the following actions will be taken:

a. A fast track recruitment process will be initiated through engagement of professional recruiting agencies to achieve the UN recommended ratio by end 2023.

b. All unpoliced areas will be covered by police stations and outposts in a phased manner to be completed as per national norms by end 2023. Similarly, decentralization of vigilance offices (VOs) will be completed and all PS/OP/VOs will be provided with state of the art infrastructure and service provisions by that date.

ii.   Implement MOITRI (Mission for Overall improvement of Thana for Responsive Image): The system of policing at the police station level will be modernized through the implementation of the MOITRI scheme in all the PSs and OPs of the state by separation of law and order duties from crime prevention and detection. For this purpose, among other things, IT services will be leveraged in all the PSs and OPs with a view to strengthen predictive, pro-active, and preventive policing as well as intelligence based anticipatory policing. This will go a long way in sufficiently reducing all forms of violence and related deaths. Accordingly, the Government will take the following action on priority:

    a.   The Government will ensure that all PSs and OPs be fully covered by an effectively implemented MOITRI scheme by 2021-22.

iii.   Provide safety to women and children: The Government is determined to achieve this priority objective through the following key actions.

    a.   Establishment of dedicated Anti Human Trafficking Unit (AHTU) in every police district and dedicated Special Juvenile Police Unit (SJPU) in all police Districts by end 2023. Such units will also be provided with vehicles, sufficient funds, computer, infrastructure and other resources.

    b.   Establishment of Women and Children Cells in all Police Stations in the State and all police stations to have child friendly corner by 2021-22. These cells to be provided with all essential resources to work effectively viz. vehicles, funds, computers, etc.

    c.   Undertake continuous capacity building and sensitization of all police personnel and making them women and child friendly. Develop a program to that effect by 31 March 2018 and implement it through all orientation and training courses for police personnel, including by establishing a Women and Child Center in the proposed Police Academy and existing training centre by end of 2021.

    d.   Strengthen interstate coordination relating to cases of human trafficking.

    e.   Ensure strict adherence to standard operating procedures (SOPs) established by Ministry of Women and Child Development and Indian Railways relating to trafficking with collaboration with Indian Railway authorities. Expand CHILDLINE services in phases to all government railway police stations in the state by end 2020.

    f.   Strengthen awareness programs. In particular, the Government will intensify involvement of children and victims in awareness programs. Awareness programs in educational institutions (in collaboration with Education Department) on child trafficking and other child related issues will be initiated beginning 2019.

g. The Government will ensure immediate and strict implementation of the Inter-State Migrant Workmen's Act, 1979, by Labor Department to prevent unaccounted/unsafe migration from the State.

h. The Government will set up a coordination mechanism by March 2018 to ensure active collaboration of all agencies and departments for restoration, rehabilitation and integration of victims of trafficking. It will also work in close coordination with the paramilitary and military forces for vocational training and placements for children and women affected.

i. An impact assessment study by an independent third party/agency of the effectiveness of Government policies and actions on reducing trafficking and safety of women and children which *inter alia* obtains feedback from women and children, will be undertaken in 2018-19. The recommendations of the study will be used to further improve programs and schemes to end trafficking and ensure safety of women and children in the state.

iv. **Community participation:** Community Policing be promoted in Assam by bringing all the NagarikSamities (cited in the Assam Police Act, 2007) under a specific Act and Rules within the ambit of the institutional framework to cover all the Police Stations and Out-posts in the State.

a. This Act will be drafted along with Rules by 30 September 2018 and passed by March, 2019.

b. A pilot project on community policing to ensure road safety will be taken up in 2019-20 called "Zero traffic violations and accidents on Guwahati-Shillong Road." This will involve all relevant communities along G-S Road, in particular schools and colleges in the vicinity and encourage volunteers to help traffic police ensure that traffic violations are cut drastically and there are zero accidents on the road within a year. Lessons from the pilot will be used to expand coverage to other parts of Guwahati and urban areas.

v. **Eliminating cybercrime:** Cybercrime is a major challenge, and disruptive technologies and social media can also adversely impact the internal security scenario. To end this emerging menace, the Government will strengthen coordination between the Departments of Information Technology (IT), and Home & Political, and integrate ICT at all levels of policing i.e. local, district and State. Priority actions to be taken include:

a. The IT Department will finalize a Strategy Paper by 31st December, 2018 in coordination with Home Department to strengthen digital infrastructure, cyber policing and cyber forensics.

b. Cyber police station will be built in each district headquarters by 2020 and in all sub-division headquarters by 2022 with skilled manpower. One state of art cyber cell headed by an SP rank officer to be created in CID headquarters for the state by 2020.

c. Cyber forensic wing dome will be set up with adequate skilled manpower and equipment by 2020 at FSL Guwahati.

d. A state-of-the-art cyber lab will be built and training programs will be organized for police trainees at the PTC, Dergaon beginning 1 January 2019.

vi. **Strengthening of Crime and Criminal Tracking Network & Systems (CCTNS):** A comprehensive CCTNS will be set up for the state. This will help create a comprehensive and integrated system for effective policing through e-Governance. The system includes developing an online tracking system by integrating police stations across the state. Geo-informatics will also be incorporated with CCTNS. A seamless data-base exchange system will be an important part of this structure and will enable exchanges for example between Assam Transport Registration and CCTNS and other relevant departments and agencies.

a. The project for a comprehensive and fully enabled CCTNS will be initiated in 2018 and be implemented in phases across the state to be fully functional by end December 2019. The details of the proposed system including its targeted timelines are set out in Appendix 1.

vii. **Preventive policing:** Preventive policing is a defining characteristic of modern police systems. Gender sensitization, dangers of drug abuse, health and hygiene and cyber ethics are essential to prevent crime. Students for example need to be sensitized to their dangers and how to avoid them through suitable curriculum based education as part of ethics and moral studies right from elementary education stage. Use of big data and data analytics will need to be employed to predict and prevent organized crimes in the state. In view of this

a. The Home Department, in consultation with all concerned departments such as Education, Social Welfare, IT etc. will undertake a study in 2018-19 on all aspects of preventive policing and preventive action to stop crime. The recommendations of the study will be used to strengthen crime prevention measures in the state.

b. A cyber dome project will be fully implemented to effectively monitor the activities in cyber space comprising of cyber security, online social media monitoring, internet monitoring, darkweb monitoring, other futuristic challenges as well as spreading awareness among citizens. The project will be fully implemented under a dedicated infrastructure at Guwahati with nodes at district headquarters by 2021.

viii.   **Strengthening of Special Task Force for combating organized crime:** The existing Special Task Force (STF) which was created in 2007 to effectively combat organized crime (related to fossil fuels, drugs, arms running, land grabbing, vehicle theft, poaching of wild animals etc.) will be strengthened with specialized intelligence, investigation, and technical wings for effectively coordinating and tackling organized crime. For this purpose, the following action will be taken:

   a.   The Home Department, in consultation with all concerned departments will prepare a strategy and action plan in 2018 to strengthen the STF in order to make it fully effective. This strategy will be fully implemented within a year of adoption.

ix.   **Ending drug abuse:** Ending crimes related to narcotics and psychotropic substances requires a two-pronged approach: from the demand side and from the supply side. In this context the following actions will be initiated:

   a.   Demand will be reduced by awareness building and education among the people. Active partnerships with Departments of Social Welfare and Education will be built up with communities, schools and colleges playing a pivotal role. An action plan to effectively reduce demand for narcotics will be prepared in 2018 by the Home Department in consultation with all concerned including NGOs.

   b.   The supply of narcotics will be checked by zero tolerance policing. In addition, convergence and coordination between Narcotic Control Bureau, and State police and Intelligence agencies will be stepped up. With regard to coordination, an effective institutional arrangement will be developed in 2018 for better intelligence sharing and monitoring by the police forces of Assam and the North-Eastern States and with Central agencies to combat narcotics and all other organized crime.

   c.   A State Narcotic Wing headed by SP rank officer for the state will be set up in CID headquarters and with branches at Dibrugarh and Silchar under DSP rank officer by 2020.

B. Overhauling of Correctional Facilities[20]

Currently Assam's jails are overcrowded and lack adequate infrastructure. The Government will convert these jails into correctional facilities in the true sense. Jails along with rehabilitation support are required to reform convicts and insurgents and help them be useful and responsible citizens once again. To achieve thisthe following major interventions will be carried out.

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[20] *Source: SPAP Prisons Dept.*

i. **Close gaps in personnel and infrastructure:** Presently the Assam Jails Department has a sanctioned strength of around 1200 personnel of which about 20 percent are vacant. There are 31 jails which are inadequate and only 17 of them have manufactory units to provide skill and employment to inmates. To remedy these gaps the following actions are proposed:

   a. Out of the 33 districts of Assam, 28 have jails. New jails will be constructed at districts of Baska and Chirang by end 2023.

   b. New manufactory units in 14 jails currently lacking them will be set up by end 2020.

   c. Necessary infrastructure in terms of housing, basic services and supporting modern technologies will be provided in all jails in a phased manner to be completed by end 2023.

ii. **Rehabilitation of released convicts and surrendered insurgents:** The Government seesJails essentially as correctional homes where prisoners must be provided education and various vocational skills so that they can earn their livelihood after release from jail. Such skills include agriculture and horticulture activities, computer literacy, software plus hardware training etc. Such programs will be scaled up and made more effective. Actions include:

   a. Reviewing the scale of payment/incentives to foster more involvement of prisoners

   b. Undertaking a study in 2018 of the success of vocational schemes in rehabilitation of ex-prisoners and using the recommendations to improve services.

iii. **Improving services by fostering technological innovations:** Use of technology can go a long way in improving correctional services and welfare of inmates. However, jails in the state have fallen behind significantly in adopting new technological innovations to improve their functioning. Accordingly,

   a. A program to cover every jail with provision of new technology such as CCTVs, e-Court, and e-Prison and e-market facility to sell manufactured products from jails will be implemented in phases beginning immediately and completing by end 2023.

iv. **Policy and institutional changes:** In order to improve the correctional system in Assam, major institutional changes are necessary. The following are priority institutional changes that will be implemented:

   a. *Initiate speedy disposal of cases of Under-Trial Prisoners (UTPs).* One of the major issues facing jails in Assam is the problem of overcrowding as a result of excessive UTP population. The Government will evolve an effective system and procedures for speedy disposal of the cases of UTPs. [Discussed in detail under Section C]

b. *Build more Open Jails.* In order to relieve overcrowding and as a measure of prison reform, the Government will create will do an assessment for the need requirements and gaps and build facilities as per requirement by 2030.

c. *Improve co-ordination and convergence:* The number of jail inmates and their conditions is a result of the overall law and order and justice scenario in the state and it is essential that there be better coordination between the judiciary and the executive to address the issue effectively. The Government will strive to improve sharing of information and resources between agencies and departments involved and foster stronger partnerships with NGOs and communities. An effective coordination mechanism for this purpose will be worked out with involvement of all public and non-state stakeholders by 30 June 2018.

C. Improving access to justice and judicial services[21]

The richer classes and corporate entities are able to seek legal remedies through law firms or well- known lawyers. The middle class which cannot afford their services go to individual lawyers or publicly-funded legal aid services organized under the Legal Services Authorities Act. In this scheme of things, it is the poor and marginalized rural and tribal communities who are left out. They suffer injustice or seek justice through informal systems. This provides a fertile ground for the exploitation of the poor and for the growth of extremist forces, undermining the rule of law and constitutional governance. The following interventions will be pursued by the Government, therefore to promote the rule of law and ensure access to justice for all:

I. **Timely and effective legal assistance to poorest of the poor:** TheDistrict Legal Services Authority (DLSA) in collaboration with NGOs and other social service groups will organize legal aid awareness camps on a regular basis so that the poor can be provided with the required legal assistance. In particular the Government (Judicial Department) will prioritize the following programs.

a. The District Legal Services Authority will be strengthened and steps to be taken for effective monitoring of its functioning.

b. Assam victim compensation scheme, 2012: This scheme will be implemented vigorously with special focus on women and children.

c. Para legal volunteers (PLV) scheme: The PLVs are engaged in legal awareness programs, legal aid clinics, and act out of front offices, police stations etc. and they act as bridges between the service seekers and service providers. The scheme which was launched in Assam in 2010 will also be effectively implemented.

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[21]*Source: SPAP of Judicial Dept.*

d. Expanding Lok Adalats: Assam State Legal Services Authority will scale up Permanent Lok Adalats, State Lok Adalats and National Lok Adalats throughout the State on regular basis.

e. A study to assess the effectiveness of all the above schemes, with feedback obtained from beneficiaries and the public, NGOs and all relevant stakeholders, will be undertaken in 2018 and its results used to strengthen the effectiveness of the state's legal aid services for the poor and vulnerable.

II. **Promote rule of law, enhance court functioning, and reduce pendency of cases:** The following actions will be taken:

a. The direction of the Hon'ble Supreme Court of India regarding creation of additional courts and different posts of Judiciary to maintain the prescribed ratio of population to the number of judges will be completed in phases by 2020-2024.

b. As per the direction of the Hon'ble Gauhati High Court, the process of establishing a different Directorate for Prosecution Services under the Home & Political Department, will be expedited and completed by June 2018.

c. The State Litigation Policy formulated by the Judicial Department will be effectively implemented including greater use made of withdrawal of cases under it.

d. Implementation of the "Maximum Three Adjournment Rule" in Civil Cases.

e. Mediation center: To create more mediation center in all the judicial districts where cases are disposed through Alternative Dispute Resolution Mechanism.

f. Bring data of all pending cases under National Judicial Data Grid System by 2018 to effectively track pendency situation.

iii. **Reduce under-trial prisoners (UTPs) as a proportion of overall prison population:** The proportion of UTPs is unacceptably high and currently accounts for 62% of total prison inmates. The Government will initiate vigorous measures to bring down this proportion of UTPs by half of the current level by 2023 in coordination with Home and Judicial departments and with the cooperation of the judiciary. The following actions are proposed:

a. Allowing more grant of bail to UTPs as per admissibility and through plea-bargaining.

b. Increasing the frequency of holding of Lok Adalats including more frequently under Jail premises to facilitate quicker disposal of UTP cases.

c. Video Conferencing facilities will be provided for connecting each Jail and District Courts expeditiously and the process of connecting each Court, Police Station, Jail of

the State should be completed in a phase-wise manner by 2020. For implementation of the aforesaid Video Conferencing facilities each Jail will be provided with Internet facility by BSNL.

D. Promoting transparent and accountable government and corruption-free society[22]

Assam has adopted the vision of openness and transparency in Government functioning with complete flow of information of Government policies, programs and schemes to citizens to promote regular feedback about people's perceptions about them to improve public functioning. The following key interventions will be prioritized in this regard:

i. **Right to Information:** The proper implementation of the Right to Information (RTI) Act 2005 is one of the cornerstones of the Government's efforts to promote transparency. The following actions to improve its functioning will be taken:

a. The state will take up the process for framing of rules for the RTI Act and the Public Records Act by 2018 for better implementation of the RTI Act.

b. Proactive *suo moto* disclosure by public authorities under Section 4 (1) (a) of RTI Act to be brought into effect by 2018. This includes in particular, publication of annual administrative reports of all departments/agencies/authorities and laying them in the Legislative Assembly as per provisions of the RTI Act by the end of December 2018.

ii. **Proactive dissemination of public information** on public/government schemes will be scaled up through the following means:

a. Development of websites and regular media content ;

b. Establishing RTI Centers and RTI cells in departments to ease public access to information;

c. Encouraging Gaon Panchayats, Panchayati Raj Institutions (PRIs), and municipalities to similarly disseminate information about public schemes;

d. Use of government officers and offices (including school teachers, Anganwadi workers, SHGs), educational institutions (particularly high schools and colleges) and health centers to disseminate information to grass root levels; undertaking outreach programs through all media including print, electronic, and social media; through outdoor campaigns; etc.

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[22]*Source: SPAP, Department of Information & Public Relations, Assam*

e. The Government will conduct a study in 2018 to assess the effectiveness of its policies and strategy, including resources, capacities and technology currently employed for this purpose to promote transparency and develop an effective action plan for the future.

iii. **Building a corruption-free society.**[23]The Government aims at creating a corruption-free society and developing resilient and accountable institutions. To do this it will combat corruption and graft in public life and government agencies, ensure a free and fair environment for delivery of public and administrative services, instill a sense of confidence among the law-abiding citizens and a sense of fear and deterrence in corrupt officials / individuals. It will strive to develop effective systems and procedures in each of the areas of prevention, pre-emption, enquiry, investigation and prosecution. It will strive for the highest levels of integrity, excellence and professionalism in all spheres of functioning of the government. Among key actions that the Government will pursue are:

a. *Digitization and cashless transactions by 2020*: The Government will make public all payments and works related information relating to public works. All Government financial transactions will be digitized and cashless. To promote Digital India, the Government will digitize information on public service delivery, and all departments will be asked to identify areas of digitization. All these will be accomplished by end 2020.

b. *Enhance accountability of Government officials*: Submission of annual property returns will be made mandatory and a pre-requisite for annual increments and promotions of government officials by 31 March 2019. The necessary provision in law for compelling prompt submission of information as required by the Vigilance and Anti-Corruption (V&AC) Branch will be enacted by 30 June 2018. By 30 December 2020 every Government Department will have a Vigilance set-up with provision for reporting to the State Vigilance Commissioner. Simultaneously, the Vigilance & Anti-Corruption Department will be strengthened beyond Guwahati and regional offices established by 31 March 2019.

c. *Quicker disposal of corruption and graft cases*: More Special Courts and prosecutors for speedy disposal of Anti-Corruption and Graft cases will be created by 31 March 2023. Stringent provisions will be established by 30 June 2018 for compelling time bound replies and responses to proposals and requisitions of V&AC investigations, at every stage. Strict directive/govt instruction may be issued for time bound granting of prosecution sanction as per SC directives.

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[23]Source: SPAP Directorate of Vigilance & Anti-Corruption, Assam

d. *Organisational reforms:* The Government will provide fixed tenures to officers working in Anti-Corruption Branch of at least two years. Steps will be taken to incentivize the officers working with the V&AC Department at par with the Central Agencies like CBI. Positions specialists such as financial experts, legal consultants, and technical consultants to support the investigation and the investigators will be created in the V&AC Department by 31 December 2018. Standard Operating Procedures (SOPs) to lay down internal guidelines on investigation procedures in vigilance cases will be prepared by 31 December 2018.

e. Other measures of miscellaneous nature are:

- All Departments will place details of works undertaken online above a threshold value of Rs.10 lakhs for public knowledge and scrutiny by 31 December 2020.
- E-governance and Mobile Apps will be used to reach out to public beneficiaries with information on public schemes by 31 December 2020.
- All Departments will institutionalize social audits by 31 December 2020 for assessment of service delivery and utilize social audit findings for improving efficiency and eliminating waste and graft.
- All Government Audit Reports by audit agencies will be put online for public knowledge and scrutiny by 31 March 2019.
- Citizen Awareness campaigns on Anti-Corruption will be started by all departments by the year 2019. Citizens will be informed about anticorruption measures in place, redressal mechanisms including legal provisions and available safeguards.
- Reward and protection schemes for whistle-blowers will be established by the year 2019.
- School curriculums will include a special focus on the issue of corruption in schools by 31 December 2018. Sensitization workshops will be conducted beginning 2018 in High Schools and Colleges regarding standing up against corruption.
- All Government Departments will explore more avenues immediately to promote participation of public / beneficiaries in public project selection and monitoring their implementation and introduce such participation in phases beginning 2018.

4. **Technological change and innovation.**

Major innovations will be promoted and latest technology employed to achieve the Goal 16 objectives described in the previous sections. As discussed new technology will be most critical and will be utilized extensively in the following areas in particular:

- **Improving police functioning** by upgrading technology of police stations, and investigating agencies in the state; providing state forensic labs with latest technical equipment; establishing a cyber-lab and using advanced technology to combat cyber crime; and setting up a criminal tracking network (CCTNS).

- **Improving correctional services** by equipping jails with CCTV cameras, e-marketing of Jail manufactured produce, increasing range of vocational training for inmates including computing and IT; establishing e-Prisons (total solution for all the activities in a Prison developed supported by National Informatics Centre).

- **Speedier justice** through developing e-courts and improved data management through e-records, and speeding up case disposal through video-conferencing facilities in courts and prisons.

- **Promoting transparency and reducing corruption** through expanding Digital India and e-Governance; using modern technology to disseminate information widely etc.

5. Partnerships

Achieving peace, justice for all, good governance and strong institutions by 2030 in the state cannot be realized without active partnerships as described in detail in the preceding sections. The foremost partnership essential in this area is to promote partnerships between executive, judiciary and legislative wings of the state. A peaceful society free of crime cannot be achieved by police and law enforcing agencies acting alone as partnerships with communities and promote community policing will be needed and will be fostered to help in creating enduring peace in the state. In order to provide legal aid to all communities it is essential to partner with NGOs, CSOs to increase the reach of legal aid and services to last mile beneficiaries. Prisons will be reformed as correctional facilities, with jails forging partnerships with private sector to provide skill development and soft skills training to inmates to help them regain a place in society. Partnerships with civil society and CBOs will be fostered also as CSOs and communities play a big role in rehabilitation of convicts and surrendered insurgents.

6. Resource requirements

Attaining the vision of Assam 2030 requires "back-casting" the implications of the vision in terms of targeted outcomes in 2030 to required physical outputs, activities, and resources both human and financial to achieve them currently and in the entire intervening period to 2030. This is an essential part of this long-term strategic exercise so that the vision can be made a reality. Planning for resources required – both financial and physical – is crucial.

(i)   *Financial resources.* The required expenditures and gaps in resources based on the strategy developed is reflected in Appendix 1 of chapter 9. Only expenditures of departments <u>primarily</u> connected with Goals 16 have been included to avoid double counting.

(ii)   *Human resources.*   The realization of Assam 2030 requires a very major scaling up of effort from current levels. Both the quantity as well as quality of services provided by the public sector has to improve. There will be requirement of more staff to provide public services. Therefore, a detailed human resource strategy needs to be undertaken within each department focusing on (i) a thorough review of all positions as to their utility; (ii) filling up vacancies of those that are critical speedily; (iii) rationalization of existing personnel and redeployment if necessary; (iv) considering outsourcing if specialized private sector entities can provide services better; (v) working out a net requirement of additional critical staff. Such an exercise has to be completed by 31 March 2018.

7. Coordination arrangements for Goal 16.

Goal	Lead Department	Supporting Departments	Cross Cutting Departments
Goal 16 Peace, Justice and Strong Institutions	Home & Political Judicial	Social Welfare, Administrative Reforms & Training, Urban Development/Panchayat &Rural Development (registrations of births and deaths),	WPT & BC, Tea Tribes Welfare, Minority Development, Char Areas, Hill Areas, Science & Technology, Information Technology, Information & Publicity. Transformation and Development, Finance Department (Oversight)

Appendix 1: Proposed Project for Strengthening of Crime and Criminal Tracking Network & Systems (CCTNS): Salient Features

The proposed project will have the following main features with the following timelines:

1. **Enhancement of existing CCTNS Systems and solutions:**

    - To strive for achieving Prime Minister's vision for achieving "SMART" policing for better police and public relationship and providing effective citizen centric services while improving the internal security by 2018-2021

    - Additional module to be developed for managing various crime related to Narcotics and drugs, Human trafficking, wildlife, antiterrorism cases etc. by 2018-2021.

    - C-form customization for lookout notice, quit India notice, illegal migrant, foreigner overstaying in India etc. by 2018-2021.

    - GIS mapping for better crime administration by 2018-2021.

2. **Online system for Motor Vehicle Accident Compensation (MACT), Arms license, lost/Found, online complaint:**

    - Integration of CCTNS, DTOs, Hospitals/Medical colleges & FSL with MACT tribunal to provide time bound services by 2018-2019.

    - MACT integration will be a first initiative in the country starting from Assam.

    - It will help citizen to track the cases online and transfer of compensation directly to victim account by court through DBT.

    - Online services for **Arms license Issuing, Lost & Found** registration etc. by 2018-2019.

    - Installation of **Kiosk** at important public places for online complaint and availing various citizen services by 2018-2019.

3. **Big Data Analytics:**

    - Data Analytics for crime investigation and improvement of law and order must be given priority.

- The CCTNS Data is going to be huge over the next few years and will need tools to analyze for crime mapping, predictive analysis & plan for remedial action.

- Big data analytics can substantially improve the extraction of report and extrapolation of data in a more eloquent way.

- The data to be generated from online system, social media as well as mobile data will be huge for which big data tools will play key role in generating the report in a more structured way.

4. Mobile application development:

- Development of mobile application to provide faceless online services to deliver citizen centric services in a time bound manner by 2018-19.
- Online registration of complaint by citizens without visiting Police Station by 2018-19.

5. Integration of CCTNS with other criminal justice system:

- The integration of CCTNS with e-Court, e-Prison, FSL, Prosecution, Juvenile is necessary to provide better citizen centric service by 2020.

- Integration with Foreigners data, Finger print database, Aadhar, ECI, Education, RTO and other central / state level database by 2020 for verification purposes for time bound services by police while helping themselves for investigation too.

6. Central Integration of CCTNS with Passport department for online processing of PVR:

- Currently the online processing of passport police verification is done using CCTNS

- GoA may take up with GOI for integration of passport seva with CCTNS for real time exchange of data for faster PVR clearance by 2019.

7. Integrated Network Infrastructure:

- Integrated Network for Police organization to cater all the services of **Voice, Data, Messaging, VC and cyber related** activity by 2020.

- The existing low bandwidth (512 Kbps) CCTNS infrastructure needs to be upgraded with NOFN link with 10 Mbps redundant link for every Police station keeping the future requirement in mind. This will be completed by 2020

- Online trial of cases using VC between Jail and courts to reduce cost and risk involved in transportation of prisoners by 2020.

8. Traffic management/ e-Challan for improved citizen centric services.

- Improvised traffic needs to be planned to improve the traffic management at city level followed by other districts.

- Also e-challan model may also be replicated to bring transparency in fine collection by 2020.

9. City surveillance (CCTV):

- The city CCTV surveillance will improve the internal security and keep a tab on criminal activities in city while ensuring safety for Citizen, women and children if used in a scientific manner.

- A long term plan may be designed by 2022 for installation of CCTV in civil/session courts/city points across the state including all Jails to improve the law and order situation while instilling confidence in citizen for their personal security.

10. Integration with NERS/dial112:

- To leverage the CCTNS network by 2020 to expand the Dial 100 to all the districts to establish single emergency number for Police, Fire & Ambulance which will be latter migrated to Dial 112 as per GOI National Emergency response number by improving the connectivity over NOFN.

11. Implementation of ERP solution, Asset management & other administrative reforms.

- Assam Police needs to adopt technology for effective human resource management to improve the efficiency by 2022.

- Solution like ERP needs to be developed on CCTNS backbone as basic IT and network is established by 2022.

- Integrated Cyber crime lab, CDR database for analysis facility to be provided in every District in a phased manner to help police to resolve the case faster by 2022.

Chapter 9: Strengthening the Means of Implementation for Assam 2030

Goal 17: Strengthen the means of implementation

Chapter 9: Strengthening the Means of Implementation for Assam 2030

Goal 17: Strengthen the means of implementation

1. Introduction

In order to achieve the vision of Assam 2030, the basic means of implementing the programs, schemes and actions necessary to realize the goals and targets of Assam 2030 must be assured and strengthened. This concluding chapter therefore focuses on five major areas comprising the critical means of implementation: financial resources; human resources and capacities; technology and innovation; monitoring and statistical capacity development for assessing progress on Assam 2030; and partnerships.

2. Financial resources

The Government will ensure adequate financial resources are available and that these do not pose a constraint for achieving Assam 2030. The strategy to ensure adequacy of financial resources is divided into two parts: a rough estimate of the resource gap; and next how to fill it.
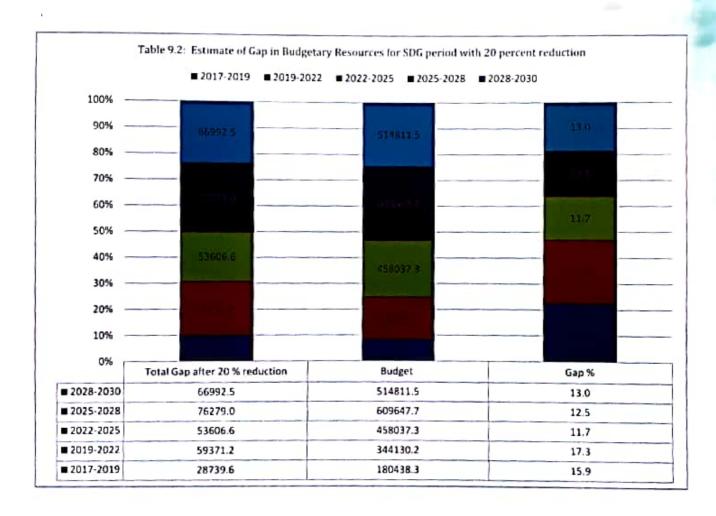
A. Resource Gap
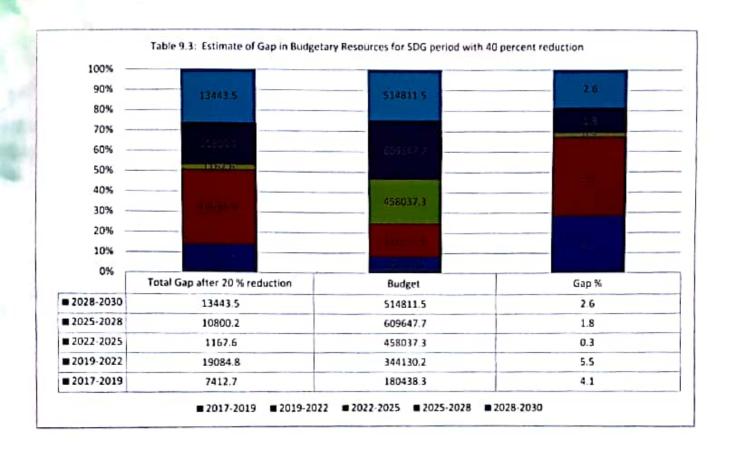
An estimate of the resource gap based on aggregating the departmental SPAPs is presented in Tables 9.1,9.2 and 9.3 under different assumptions below. Each department prepared its gap based on the method of "back-casting" suggested for the SDGs which assumes

Table 9.1: Estimate of Gap in Budgetary Resources for SDG period with no reduction

■ 2017-2019   ■ 2019-2022   ■ 2022-2025   ■ 2025-2028   ■ 2028-2030

	Total Gap after 20 % reduction	Budget	Gap as a % of total budget
■ 2028-2030	133921.9	514811.5	26.0
■ 2025-2028	154046.2	609647.7	25.3
■ 2022-2025	111383.8	458037.3	24.3
■ 2019-2022	107758.8	344130.2	31.3
■ 2017-2019	54194.4	180438.3	30.0

that Assam 2030 targets are fully met by the 2030 terminal year and works backwards projecting appropriate outcomes levels annually from the baseline values of 2016-17 to 2029-30 and corresponding resources required to support them.

Table 9.2: Estimate of Gap in Budgetary Resources for SDG period with 20 percent reduction

■ 2017-2019   ■ 2019-2022   ■ 2022-2025   ■ 2025-2028   ■ 2028-2030

	Total Gap after 20 % reduction	Budget	Gap %
■ 2028-2030	66992.5	514811.5	13.0
■ 2025-2028	76279.0	609647.7	12.5
■ 2022-2025	53606.6	458037.3	11.7
■ 2019-2022	59371.2	344130.2	17.3
■ 2017-2019	28739.6	180438.3	15.9

Table 9.3: Estimate of Gap in Budgetary Resources for SDG period with 40 percent reduction

	Total Gap after 20 % reduction	Budget	Gap %
■ 2028-2030	13443.5	514811.5	2.6
■ 2025-2028	10800.2	609647.7	1.8
■ 2022-2025	1167.6	458037.3	0.3
■ 2019-2022	19084.8	344130.2	5.5
■ 2017-2019	7412.7	180438.3	4.1

■ 2017-2019   ■ 2019-2022   ■ 2022-2025   ■ 2025-2028   ■ 2028-2030

The resulting picture shown in the above Tables suggests that the cumulative gap (2017-30) for funding Assam 2030 is of the order of around 13% of the cumulative budget if Government succeeds in a limited way in reducing expenditures; or the gap can be completely eliminated if the Government succeeds in fully expenditure reduction measures. The latter will require that all Departments adopt the following expenditure reduction measures:

i.   **Introduce efficiency, innovation and new technology.** All Departments will actively make efficiency improvements through reducing wastages, cutting unnecessary expenditures, introducing innovations, and introducing new cost-cutting technology *to reduce expenditures by a minimum of 20 percent* (see also Section 4).

ii. **Actively seek partnerships.** All Departments must seek partnerships to result in a *minimum reduction of 20 percent* in their own expenditures for the SDGs (see Section 6).

If the Departments succeed in reducing (i) and (ii) by 10 percent only, a gap emerges amounting to 13 percent of the cumulative budget for the period 2017-2030.
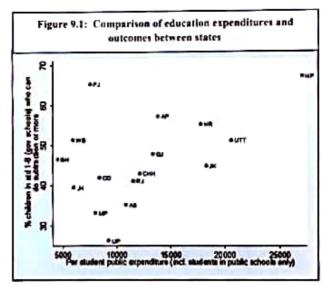
The above estimate of gaps will be independently reviewed and validated by an independent agency assigned by the Government[24]. This verification process will be completed by April 2018.

As possibility of a significant gap emerging exists, the Government will take the measures indicated in Part B below.

B. Filling the Gap

The Government intends to fill the gap in resources for the SDGs in six main ways as discussed in detail below.

i. **Expenditure reduction and efficiency improvement measures.** The Government will strive to ensure that maximum improvement in efficiency will be introduced to deliver basic services in all departments. There is immense potential in improving efficiencies as Figure 9.1 shows.[25] Despite Assam spending more per student in public schools than states like Punjab, Odisha, West Bengal, Bihar and Jharkhand, children's learning outcomes in math were much lower. The same is true for other learning outcomes. Also, Assam, along

Figure 9.1: Comparison of education expenditures and outcomes between states
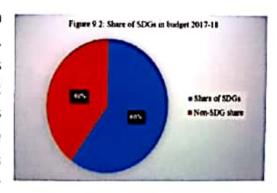
with almost all states in India spends more per pupil in education in public schools with lower outcomes than private schools which are invariably more efficient–producing much higher learning outcomes at lower costs.

The Government will prioritize efficiency improvements in all areas and target reducing expenditures by a minimum of 20% on the SDGs through efficiency improvements. Help of innovations and cost-cutting technologies using best practices achieved in other states and elsewhere in Asia will be employed for this purpose.

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[24]Such as the National Institute of Public Finance and Policy (NIPFP)
[25]Ambrish Dongre (IIM Ahmedabad) and Avani Kapur (Accountability Initiative): How much does India spend on elementary education? Column in Ideas for India posted 2 February 2015 and available at http://ideasforindia.in/article.aspx?article_id=407

ii. **Prioritizing SDG expenditures through reallocation from areas of lower priority.** Reallocating expenditures from non-SDG (less priority) areas to SDG priority areas is one of the first measures that will be employed for raising resources for the SDGs. The Government has already taken the first step in this direction by mapping expenditures to the outcome budget (Figure 9.2). The share for

Figure 9.2: Share of SDGs in budget 2017-18

2017-18 was 60%. A closer scrutiny of non-SDG functions and expenditures will be carried out in 2018 which is expected to free additional resources to fill the gap.

iii. **Revenue augmentation measures.** The ratio of the state's own resources to total has fallen from 39.09% in 2006-07 to 29.29% in 2015-16. This indicates that there is potential for raising own share to about 40% as was achieved before. This will require identifying new sources for mobilizing resources.

- The Government will actively seek new sources of tax and non-tax revenues.

- The share of sales taxes —now subsumed by GST— accounted for 80% to total own tax revenues (OTR). Although the rate cannot be changed by the state, better compliance is possible and will be pursued as the entire GST system gets digitized with a larger number of manufacturers and traders likely to be brought under the net.

- The major component of non-tax revenue is royalty on petroleum crude which constitutes about 70% of the total yield. New oil fields and other sources of non-tax revenue will be found to reduce the over-dependence on oil revenues. Forest produce is a potential area where leakages could be reduced through better administrative efforts, for example.

iv. **Greater devolution of SDG functions to local governments.** The Government will expand devolution to local governments (urban local bodies and PRIs) and encourage substitution of state level SDG expenditures by local level expenditures through their own revenue augmentation efforts.

- Although the Constitution has provided for devolution of 29 subjects from the state to PRIs and 18 to ULBs, the actual devolution of subjects is mostly incomplete in both cases. The finances of both the PRIs and ULBs are in a state of disarray with

governance issues (both misappropriations as well as inefficiencies in collection) needing to be addressed urgently,[26] which will have a bearing on their finances.

- The dependence of the PRIs and the ULBs on the state and outside grants remains overwhelming. In 2015-16 for example, PRIs raised own revenues to cover only 30% of their revenue expenditures; and only 3.5% of their total expenditures (including those supported by transfers from the state and Finance Commission grants) were from own revenues. The total gap filling (revenue and capital) requirement for both PRIs and ULBs was estimated by the Fifth State Finance Commission at Rs. 1235.37 crores in 2019-20.[27] The Government will provide capacities to augment own revenues to at least cover all revenue expenditures by March 2020 and a significant portion of total expenditures by 2024-25.

v. **Debt financing possibilities.** In this area there are distinct possibilities as there is considerable headroom to contribute resources to the SDG effort.

- The current state debt: GSDP ratio (Rs. 49,895 crores of debt to Rs. 284,563 crores GSDP) as per BE 2017-18 is 17%; and interest payment to revenue receipts (IP/RR) is 7.3% against prescribed Fiscal Responsibility and Budget Management (FRBM) limits of 25% and 10% respectively. At 25% debt: GSDP ratio, the total allowable debt liability would be Rs. 71,000 crores. Therefore, over the next 5 years, there is likely to be a cushion of additional debt liabilities of around Rs. 23,000 crores.

- Additional liability incurred through proposed new externally assisted projects (EAPs) is around Rs. 6233 crores. As the current utilization still allows room for more EAPs in Assam.

vi. **Additional central supported projects.** The State Government will work closely with the Central Government to ensure that Assam does not fall behind other states in achieving the SDGs which the Government of India has committed to achieve along with the rest of the world by 2030. The use of Centrally sponsored projects and their scaling up will be explored so that resources and capacity gaps if they still exist after all the above measures are vigorously adopted are fully filled. In this effort, close monitoring of outcomes in comparison with Indian average and that of other states will be necessary which is discussed more fully in Section 5 below.

3. **Human resources**

Even more than financial resources are human resources for achieving Assam 2030. In

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[26] Report of the Fifth Assam State Finance Commission
[27] Report of Fifth State Finance Commission Annexure 10.5.

its 450,000 strength of state employees, and 35,000 elected members and permanent staff of Panchayati Raj Institutions (PRIs)[28], the state possesses a most valuable resource, which if properly motivated and skilled, can be a powerful instrument for change in the state and help spur it towards achieving the vision of Assam 2030. With this in mind, the Government has undertaken a number of critical measures as discussed below.

A. Orientation and motivation of staff to achieve Assam 2030

The Government has at the highest levels provided leadership to the SDG program in the state which has been one of factors that the program has taken off speedily in Assam, the first to adopt the SDGs in the country. The Chief Minister and Chief Secretary have actively supported the effort to achieve the SDGs. The Chief Secretary provided leadership and motivation throughout. Such efforts will be essential to keep the program on track and succeed in achieving Assam 2030.

The Government initiated an intensive program of orientation and motivation of staff from the day the SDGs were adopted. Senior and middle level staff in the Departments and Directorates were invited to several seminars and conclaves over the last two years which provided comprehensive orientations to them. At the conclaves which were all participated by a large number of staff, intensive discussions took place on the SPAPs with staff contributing meaningfully by providing inputs for developing strategies and actions to achieve the SDGs. By now, senior and middle level staff in Guwahati have good understanding about the SDGs and Assam 2030. As a large number of them were also involved in the process of developing Assam 2030 and the Assam Agenda 2030, considerable ownership towards the program has been built up which is an invaluable asset essential for implementing the program till 2030.

The message of the SDGs needed to be carried down to the field level also as that is where the programs and schemes supporting the SDGs will be implemented. Accordingly, an intensive campaign to sensitize the entire state government staff has been launched. At the first stage, staff from the SDG Centre provided orientation to the Deputy Commissioners and district level functionaries at meetings held at all district headquarters in the state which were widely attended. The Deputy Commissioners were tasked with bringing the message of the SDGs down to the PRI and block staff and village level functionaries.

The orientation and motivation program will be integrated within the training modules of all staff for all training conducted beginning April 2018 so that these take place on a sustainable basis henceforth.

B. Making better use of staff to achieve Assam 2030

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[28] *Report of the Fifth State Finance Commission. The Commission had also proposed an additional 20,000 permanent staff at the panchayats.*

The Government will make efforts to improve staff functioning to support the SDGs in several other ways. These are listed below.

i. Government Process Re-engineering (GPR) is critical for time efficient delivery of services. All departments will undertake GPR within September 2019 and based on it conduct a reorganization of work and functions including delegation of powers to make the best use of human resources at their command.

ii. A Work Study will be conducted by a competent organization by September 2018 to assess the functioning of the departments to identify issues related to their HR capacity, optimal division of work, delegation of powers, team building chemistry etc. Based on this and the GPRs, the staff resources will be reorganized and revamped to function better support the SDGs.

iii. Service Rules of all employees in all departments are to be thoroughly reviewed by March 2019 to ascertain need for amendments to facilitate better work environments for employees to improve service conditions.

iv. Annual Confidential Reports (ACRs) which are critical for promotions will be processed transparently and timely with the help of an online management system available to all employees. All departments will establish such a system with the help of NIC by December 2019 after making suitable budget provisions. The Government will also consider refining the ACR formats to include specifically contributions made by individual staff towards the outcomesof the department concerned.

C. Expansion of capacity building infrastructure

Currently, a Secretariat Training School (STS) in Assam Administrative Staff College has been training Secretariat staff of the state. These employees are also trained in ISTM, New Delhi in batches. Assam Institute of Management (AIM) also provides customized training to Secretariat staff. However, the capacity building infrastructure remains inadequate for the large task of training and skilling employees to convert them all to change agents working together to achieve Assam 2030. With this in mind the Government will take the following actions:

i. A training institute of international standards will be established at Dima Hasao district by June 2020.

ii. In order to cater to the needs of all the support staff of all departments, four Regional Training Institutes for Grade III and Grade IV employees will be set up by December 2020 across the state to provide standard and customized training at the zonal level.

iii. Some Departments e.g. Panchayat &Rural Development, Education, Home, Forest & Environment, Fishery, Health & Family Welfare, Revenue & DM etc. have their own Training Institutes. The Finance Department plans to have an on line 24x7 live training

site very soon. All departmental training institutes require revamping urgently. The Government will undertake a review of all department training institutes by March 2018 and complete their upgradation process by June 2019.

D. **Improving quality of existing training programs**

The following measures will be taken to improve the quality of training.

i. **Needs assessments.** Departments will conduct training needs assessments (TNA) for their personnel by September 2018 to achieve the SDGs with the help of trainers trained by AASC (with assistance from the SDG Centre) for this purpose. With their needs thus assessed the departments will approach AASC, AIM or any other institute with requisite expertise to design courses and modules by December 2018 for quality training of staff to effectively implement the SDGs. While designing courses to meet demands the departments will ensure customized courses are prepared by December 2018 for the employees in the areas under the VI Schedule of the Constitution (tribal areas).

ii. **Budget allocation.** Departments will allocate 0.5% of total salary budget for training and provide it in the Budget Estimate (by December 2018).

iii. **Exposure visits.** Exposure visits are very important to learn about best practices and experiences of countries similarly placed and how they have successfully solved commonly faced problems. Therefore, departments will also promote exposure trips as necessary based on the needs identified by the TNAs conducted. The Lee Kuan Yew School of Public Policy, Singapore has been training 20 officers every year from the state for the last few years. The scope for international exposure will be widened.

iv. **Accessing best practices.** Apart from exposure visits, AASC (supported by the SDG Centre) will actively seek resource persons, both Indian and Asian experts, beginning immediately and continuing throughout the SDG implementation period, with experience of successful practices in other states of India and the Asian region, to initiate a steady flow of ideas and innovations that have succeeded elsewhere. AASC (supported by SDG Centre) will also establish simultaneously a knowledge and best practices exchange with knowledge institutions in India and abroad with expertise in SDG areas.

E. **Training of field and grassroot level staff**

It is essential the state to involve staff at all levels including the panchayats and municipalities in the effort to achieve the SDGs. Efforts in this area will focus on the following interventions:

i. For orienting elected members in Panchyati Raj Institutions, and sensitizing them of

SDGs and their expected roles in achieving them, a well-planned training program will be designed by the Panchayat & Rural Development Department by June 2018. The Department will also expand the capacity of the State Institute of Panchayat & Rural Development (SIPRD) for conducting training. Extensive use of extension centers will also be made.

ii. At the same time, the PRI's counterparts in the areas under VI Schedule of the Constitution spread across six territorial districts (the Village Council Development Committees and Village Development Committees) will be supported with nominated members to these committees and provided hand-holding to achieve the SDGs. A Training Institute for the VCDC/ VDC members would be established by March 2020 by WPT&BC.

iii. Staff and elected public representatives in the urban local bodies will also be trained to support the achievement of the SDGs by 2030. A dedicated training institute– the State Urban Development Training Institute will be established by March 2020 for their customized training as needed.

4. Technology and innovation

Technology and innovation are as critical as financial and human resources for achieving Assam 2030. As has been described in every chapter, adoption of new technology and innovative ways of doing things will be essential if the goals and targets of Assam 2030 are to be realized.

A. Priority technology identified by Assam for the SDGs.

Technology can help in providing more efficient –and lower cost–means of providing services. In the long term period till 2030, the pace of new technology arrivals will increase at a much faster pace than ever seen before, disrupting the older ways of delivering services and conducting activities. Critical areas where technology will be utilized to support the Goals as highlighted in previous chapters include the following.

- *Poverty and Hunger.* (i) **Irrigation–** new technologies to conserve canal water (such as through canal lining) and expanding use of solar power to energize pumps; (ii) **soil conservation–** scientific soil mapping and use of soil health cards (SHCs); (iii) **agriculture–** use of more efficient mechanization, e-marketing information systems and development of cold chains; (iv) **panchayat services** – introducing e-governance systems to improve performance in rural development.

- *Health and clean water.* (i) **Management of health system–**ICT applications to improve patient data and records; strengthening the health information management (HIM)

system, strengthening health systems, performance management of facilities; human resources management and development including training through IT based platforms; (ii) **water supply**– introduction of supervisory control and data acquisition (SCADA) system, to reduce interruptions in supply and eliminate 'non-revenue water'; (iii) **sanitation**– technological innovations and IT for sanitary toilet, waste management as well as monitoring needs; (iv) **service expansion**– telemedicine to provide clinical health care remotely in rural areas and expanding mobile health clinics.

- *Education.* (i)**Expansion of access**– through ICT infrastructure including telephone and high speed internet connectivity to enable teachers teach larger number of students using innovations in teaching methods; use of virtual classrooms; use of digital lessons; grading work through computers etc.; (ii) **curriculum improvement**– using improved technology for fostering learning friendly environment and improved learning outcomes; (iii) **teacher evaluation, quality assessment and training**– improved tools and methodologies using new technologies for these purposes; (iv) **management and governance of education**– through advanced ICT platforms.

- *Gender and inequality.* (i) **Reaching deprived pockets**– innovations to provide services at the last mile, including virtual teaching; tele-medicine and mobile clinics; low cost and innovative housing; off-grid provision of electricity using solar power; innovative methods to protect the environment; (ii) **universal coverage with Aadhar**– for full access to services by all.

- *Industry and infrastructure.* (i)New product development –developing new technology and processes using local resources; and in setting up incubation centres for enabling entrepreneurs to exploit such potential; (ii) **sustainable technology**– to be introduced in all industrial establishments for sustainable production and eliminating waste, effluents and other pollutants.

- *Urban development and housing.* (i) **Housing**– new split bamboo technology for construction of EWS houses under PMAY will be promoted; and other innovations in low cost and safe housing technology will also be identified and adopted; (ii) **urban infrastructure**– construction technology (including 3D technology) in roads, bridges, flyovers, pedestrian friendly walkways will be explored and adopted; (iii) **smart cities**– for better municipal governance and services will be promoted as well as use of IT for improving municipal governance and provision of services.

- *Environment and climate change.* (i) **Technologies to harness solar energy**– for generation of electricity and its sustainable uses in agriculture, industries, households, transport systems etc.; (ii) **pollution mitigation and lowering carbon emissions**– technologies such as alternative material in construction (such as LCEC concrete);

improved technology for sewage and industrial effluent treatment; technology to convert "waste to wealth" etc; (iii) **monitoring, surveillance and early warning–** using new IoT, GIS/GPS/Remote Sensing and LiDAR technology for better monitoring of air, water and soil pollution; as well as monitoring conservation efforts for forests, reserves, waste land, water bodies and mapping of flood plain; and for early warning systems for floods and natural disasters and surveying damages caused; (iv) **flood prevention–**new technology will be used including for arresting erosions, using alternative material for strengthening embankments etc.; (v) **cold chains–** new technology to improve chains and eliminate waste of agricultural produce.

- *Governance and institutions.* (i) **Improving police functioning–** by upgrading technology of police stations, and investigating agencies in the state; providing state forensic labs with latest technical equipment; establishing a cyber-lab and using advanced technology to combat cyber crime; and setting up a criminal tracking network (CCTNS). (ii) **Improving correctional services–** by equipping jails with CCTV cameras, e-marketing of jail manufactured produce, increasing range of vocational training for inmates including computing and IT; establishing e-Prisons (total solution for all the activities in a Prison developed supported by National Informatics Centre). (iii) **Speedier justice–** through developing e-courts and improved data management through e-records, and speeding up case disposal through video-conferencing facilities in courts and prisons. (iv) **Promoting transparency and reducing corruption–** through expanding Digital India and e-Governance; using modern technology to disseminate information widely etc.

The Government will maximize efforts to make use of existing and new technology in these areas and actively seek technologies becoming available for supporting each of the Goals in order to expand and improve quality of services; bring in efficiencies and lower costs of delivery.

B. Laying the groundwork for accessing and using new technology.

In order that Assam can access new technology, it must create the necessary environment, possess the required infrastructure, and be ready to provide technology services– else it will fall behind. The IT Department will play a critical role in this effort and act as a fulcrum. To do so, it has adopted a set of key objectives or "Missions" and essential actions as listed below.

Mission 1: Enable electronic delivery of services to citizens in an easy, effective, transparent and inclusive manner

i. Identify services and map them to stakeholders

ii.   Undertake Business Process Re-engineering and e-enable departments for electronic services

iii.   Prepare digitization plan for the state and all departments including records to be digitized and their management and storage

iv.   Develop last mile entrepreneurs for providing consumer services

v.   Make all government information open to public (open data initiative)

vi.   Make available all portals/websites in local languages

vii.   Assess customer satisfaction and quality of services through SMS and mail

Mission 2: Develop ICT infrastructure to bring IT to the doorsteps of citizens

i.   Develop a comprehensive roadmap for providing reliable connectivity in coordination with power utilities, internet service providers and other telecom operators

ii.   Mandate adequate provisioning (2-3%) by all departments in their budgets for IT

iii.   Adopt open and e-Governance standards, frameworks, protocols, operating procedures, and service agreements for management, maintenance and security of infrastructure

iv.   Develop fail proof mission critical model for storage and retrieval of data; business continuity model to ensure security and uninterrupted services; and a sustainability model for core infrastructure

Mission 3: Promote inclusive and sustainable growth of electronics, ICT and IT enabled service (ITeS) industries

i.   Set up startups, incubation centers and accelerators and institute awards for innovation

ii.   Encourage angel funds, venture capital etc., to support industry and startups

iii.   Set up an Innovation Fund for ICT and electronics system design & maintenance (ESDM)

iv.   Develop a conducive environment for Public Private Partnerships

v.   Incentivize R&D for product design and aesthetics; and provide world class test labs and research infrastructure for industry

vi.   Create a hub and spoke model for developing franchisee and ancillary units

vii.   Create special vehicles for exports promotion, IT investments and network services

viii. Promote the "Make in Assam" and "Brand Assam" brands

Mission 4: Develop ICT skills for rapid growth of IT sector

i.   Plan for capacity building, change management and resource augmentation

ii. Create a pool of master trainers through regular Training of Trainers programs

iii. Restructure academic programs for science in schools and colleges for skill enhancement; create content for science and technology education in vernacular languages; develop vocational skills and training curriculum

iv. Develop and promote ICT in local languages and dialects

v. Adopt best practices of service delivery through process of evaluation and localization

vi. Groom and guide educated youth for industry-readiness including by promoting professional proficiencies by establishing technology specific academies and schools such as CISCO, RedHAT, Oracle, Microsoft, VLSI, VFX etc.

vii. Empower women, differently abled and economically weaker sections of population for accessing and using ICT tools for bridging the multi perspective digital divide.

viii. Develop national and international exchange programs with institutes of repute.

ix. Develop an effective information, education and communication (IEC) outreach program.

The achievement of these Mission objectives will also require policy, institutional and organizational changes. The most critical of these are

i. **Policy changes.** A new IT policy and associated policies in areas of hardware usage, e-governance, core infrastructure and usage is essential for spurring development of IT in the state. Such as policy will be announced by December 2018.

ii. **Establishing new entities.** The Government will also review by June 2018 the revamping of the existing IT organizational structure and the need for a new IT Directorate; creating new subsidiaries of AMTRON; and setting up special purpose vehicles (SPVs) to facilitate IT growth.

iii. **Strategic alliances.** These will be necessary with (a) industry pioneers such as Intel, Oracle etc., to provide skill development; (b) with national and international R&D institutions, laboratories, test houses, certifying agencies, standards organisations, industry associations, professional consortia etc., to build up a knowledge pool of expertise and best practices of international standards; (c) with startup accelerators, and venture capitalists; (d) with overseas technology partners and private sector for innovation and product and services development.

C. Creating a culture of innovation, technology-seeking and adoption

The Government is intent on creating an innovation and technology environment in the step. Among the major initiatives taken recently include the following.

i.   **Establishing an Innovation and Technology Hub.** This has been set up in the Assam Administrative Staff College in order to enthuse employees in the public sector to inculcate a belief and sense of innovation and to transmit it to others. The Hub will have an exhibition section where some examples of latest technologies and innovations will be placed for viewing; and a laboratory for designing and creating innovations and developing novel and relevant technologies.

ii. **Innovation laboratories.** The Government has also organized innovation laboratories for Government staff in 2017 to help them formulate ideas that could produce innovative ways of conducting their work and improving public delivery of services. Participants were enthused to think differently and innovatively and came up with several new approaches and ideas.

iii. **Ideathons.** An "ideathon" –to promote innovations among youth –was organized in November 2017, a two-day event which saw 26 teams with over 120 participants from across Assam coming together for creating small scale solutions through IT platforms and social science application and ideas. Several such new ideas were presented, in a wide range of areas including agriculture and value chains; flood embankment protection; handlooms; floriculture; developing alternative local raw materials; health services in rural areas; better employment search vehicles; improving earnings of transgender community etc. Such "ideathons" will be organized regularly to inculcate a culture for innovation among the students in the state.

iv. **Best practices in technology and innovation.** As described in the section on human resources 3.D.iv above, AASC (supported by the SDG Centre) will establish a system to popularize best practices on the SDGs from other states and other Asian countries. This will include best practices in technology and innovation for the SDGs, using outside experts, knowledge exchanges and exposure visits.

5.   Monitoring and statistical capacity

This extensive Assam Agenda 2030 encompassing goals and targets, their outcome indicators, required interventions and actions, and projects to deliver them will require an efficient and reliable information system updated timely and regularly for use of policy makers and managers of programs and schemes. Such a monitoring system is critical to assess progress being made on Assam 2030 and to make timely course corrections and adjustments. Such a monitoring framework will span two levels–outcomes, and projects and actions; require an efficient dashboard i.e. a useful display platform for ease of assessing progress; and require statistical and organizational capacity to be built up quickly.

A. Monitoring of outcomes.

Progress ofAssam Agenda 2030must ultimately be assessed by the final development outcomes envisioned. These are measured through outcome indicators of which around 60 core indicators have been identified at the initial phase based on relevance and availability of data for monitoring. Each indicator has been benchmarked at 2016-17 and final (2030) targets and intermediate targets provided. In the future, improvements will be affected along the following lines:

i. **Expansion of indicator set.** This initial set will be refined and augmented to enable better monitoring, keeping in mind simplicity (as too large a set is unnecessary and may lead to information overflow); and ease of data availability and costs of updating.

ii. **Disaggregation.** State level averages do not provide sufficient information to enable meaningful monitoring. In the case of Assam, it has been decided that at the minimum disaggregation would extend to

- Geographical dimensions including (a) Districts; (b) Char Areas; (c) Border Areas
- Population groupings including (a) Gender; (b) Scheduled Castes, Scheduled Tribes, Other Backward Classes; (c) Tea Garden Labour Community

iii. **Periodicity of updating:** The data would be updated at least annually in most cases.

B. Monitoring implementation of projects and actions.

Assam Agenda 2030 will be delivered through projects and key actions.

i. **Project monitoring.** The Assam Agenda 2030 discusses in each chapter key interventions necessary to achieve its goals and targets. These interventions in turn will be implemented through projects and schemes.

Following adoption of the Agenda, all Departments will conduct a review of the portfolio of projects and schemes supporting each identified interventions— which consist of (a) Centrally sponsored and supported projects and schemes; (b) externally aided projects and schemes; and (c) state supported schemes. The review will result in a rationalization of projects including amalgamation, termination or expansion of existing projects based on an assessment of their usefulness. This exercise will be completed within 3 months of adoption of the Assam Agenda 2030.

The resulting rationalized list of projects will be taken up for close monitoring under the monitoring framework. For this purpose, project monitoring parameters

will be established including physical targets and timelines for achieving them; and financial targets including disbursements and utilization of funds.

ii.   **Action monitoring.** Each intervention in Assam Agenda 2030 is also dependent on crucial actions including policy changes, organizational or institutional reforms, studies or reviews, forging of partnerships etc. Timelines within which such actions will be adopted have also be set up. The monitoring framework will also monitor progress on the completion of such actions.

C.   Dashboard.

The monitoring parameters for both A and B levels will be displayed in a simple dashboard which will set up alerts in case progress on outcomes or projects or actions are falling behind schedule or not achieving desired results such as not reaching targeted groups etc. This will help managers of the Agenda at state and district level to initiate corrective action as appropriate to place the state on track again to reaching targets.[29]

D. Statistical Capacity Building and establishment of administrative machinery for monitoring.

The monitoring framework described above will require generation of data not only for the state as a whole but also for required disaggregated categories. For the monitoring framework to be useful the data also needs to be generated and presented frequently so that it is useful for managers and policy makers. For this purpose, the state will cooperate with Central agencies (such as NITI *Aayog* and MOSPI) and make use of platforms being put in place nationally and suitably adapt them for the requirements of the state.

Considerable data may be obtained from administrative sources –such as from ASHA workers who are mandated to record health related data; or from *anganwadi* workers who keep data on children's health; or from the school systems who report on education indicators– but the systems to systematically use such data need to be streamlined so that the data generated are reliable and of good quality and can be generated in real time through upgrading inputting systems, such as by providing those who input the data with smart devices which can transmit data directly into the monitoring system with appropriate software to aggregate the generated data and present it in the dashboard in real time.

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[29]A "traffic light" system which provides color codes to signal alerts is an example which was employed by the UN system for assessing progress on the MDGs. See Assessing India's Progress in Achieving the Millennium Development Goals: Key Drivers of Inter-State Variations (S. Chatterjee, M. Hammil, N. Kumar, and S. Panda). UNESCAP, New Delhi 2016. Available at http://www.unescap.org/sites/default/files/SSWA-Development-Papers-1502-final.pdf

However this process will take time, resources, training and all round effort to get it up and running. The use of such administrative data for the monitoring system –for the subset of indicators that such data can support– is targeted to be fully operational by June 30, 2020 or earlier as suggested by the study mentioned below. There will be other indicators which cannot be generated through administrative data (such as to measure poverty levels for example).

For the subset of indicators that cannot be generated by administrative data, and even for those where administrative data can potentially contribute to their generation but will not be available till June 2030 till the system for generation of such administrative data is up and running, surveys will have to be used to fill the gap.

This will require local capacities to be developed to produce survey based data on a regular basis. This is the responsibility of the Directorate of Economics and Statistics (DES) which will require considerable capacity upgradation to deliver high quality survey results for the monitoring framework.

Some data (such as for expansion of forest land) will be available from GIS systems supported by the Central government. Such data may need to be tailored to produce results for special categories such as char areas and border areas. The State government will have to liaise and if necessary support efforts by Central agencies to obtain the data it needs according to its requirements.

A study to assess requirements and recommend an appropriate system –in consultation with all concerned stakeholders and partners including NITI Aayog, MOSPI, and international partners willing to support the monitoring system (UNDP, UNICEF etc) based on the above parameters will be prepared by June 2018.

6. Partnerships

Assam 2030 cannot be achieved by the Government acting alone. It requires the entire people of Assam and all stakeholders who are interested in the welfare of the state to actively contribute to achieve its grand vision. The appropriate areas where partners can play a role have been discussed in individual chapters of this report.

The Government will therefore encourage all stakeholders to shoulder responsibilities for achieving the SDGs. Although the participation in the state's development by other stakeholders holds great potential, actual participation historically has been below par so far. However, the Government expects that this will change dramatically in the period to 2030 and will work towards bringing about a paradigm shift in the nature and scale of partnerships for the SDGs.

To do so, the Government will devise a partnership strategy for the achievement of the SDGs by June 2018. As the private sector and civil society can and must play a bigger role, special measures to create an appropriate environment –including appropriate policy, organizational and institutional changes– for them to participate effectively to achieve the SDGs will form a part of this strategy. The strategy will also discuss how all other critical stakeholders, including students and youth, and academia can play a vital role in realizing Assam 2030.

7. Coordination arrangements for Goal 17

Goal	Lead Department	All other
Goal 17 Means of Implementation	Finance, Science & Technology, Information Technology, Administrative Reforms & Training (improving capacity of public functionaries), T&D (Directorate of Economics and Statistics for Strengthening monitoring)	Departments are supporting departments

Appendix 9.1

SI No.	GAP without reduction for innovation; partnerships Dept.	2017-2019	2019-2022	2022-2025	2025-2028	Rs. In Crore 2028-2030
1	Panchayat and rural Development	5909.0	3347.0	7690.0	14831.0	12933.0
2	Agriculture	5396.1	5986.0	6157.0	6174.0	6099.0
3	Animal Husbandry and Veterinary	330.5	643.8	856.9	1140.5	963.1
4	Fisheries	1360.9	1496.9	1646.6	1811.3	1992.4
5	Health and Family Welfare	544.5	3595.5	8536.2	17245.4	17488.1
6	Public Health Engineering	3623.9	9622.5	-3441.4	-4704.3	-4042.3
7	NHM	2140.6	2849.2	3792.2	5047.4	4262.3
8	School Education	499.5	350.9	356.8	363.2	205.0
9	Higher Education	5.9	5.3	31.8	28.6	184.4
10	Technical Education	4.5	10.1	15.7	294.1	413.5
11	Non-formal & Adult Education	-13.5	-25.2	-33.6	-44.7	-37.8
12	Sports and Youth Welfare	-0.2	-0.2	-1.2	-1.4	-1.5
13	Social Welfare	348.0	1362.0	2018.0	1493.0	1731.0
14	Environment and Forests	2602.7	3736.6	3954.8	4191.0	5359.1
15	Soil Conservation	309.0	461.0	477.0	311.0	102.0

16	Information and Technology Department	1857.1	4441.0	3809.1	3303.3	2789.5
17	Public Works Roads Department	3880.0	5847.0	5723.0	5384.0	3297.0
18	Irrigation	1913.0	11557.0	10688.0	12690.0	7820.0
19	Home & Political Dept.	2072.2	6249.0	13255.0	25156.0	27093.0
20	Water Resources (Flood Control)	2018.7	12542.5	13345.6	16780.3	10515.9
21	Border Protection &Development Department	54.5	-9.5	-105.3	-231.1	-138.0
22	Handloom & Textile	172.7	329.4	411.5	583.6	492.9
23	Power	14700.1	14269.4	9476.5	11953.8	10094.3
24	Science & Technology	9.4	247.4	59.7	51.1	17.1
25	Food Civil Supplies and consumer affairs	0.0	-239.5	-318.7	-424.2	-358.2
26	Bodoland Territorial Council	2473.0	10216.0	15719.3	22482.6	18672.4
27	Industry and Commerce	293.6	559.9	745.2	991.9	837.6
28	Welfare of Minorities and Development	150.6	299.1	442.9	666.9	630.5
29	General Admin. Dpt.	-45.7	-166.5	-221.6	-294.9	-222.6
30	Skill, Employment and Entrepreurship	152.1	366.7	206.2	448.7	461.5
31	Transport Dept.	91.3	279.2	254.9	263.5	169.2
32	Guwahati Development dept.	4.0	10.4	14.2	15.1	9.1
33	Excise Dept.	1.5	2.5	2.6	2.9	2.1
34	Cooperation	1.0	1.3	-1.0	-2.8	-2.8
35	Mines and Minerals Dept.	6.9	33.5	18.9	21.4	17.6
36	Urban Development Dept.	1066.6	1355.2	311.0	966.0	252.0
37	IT Dept.	0.0	5611.7	4833.6	3983.8	2860.3
38	Hill Area Dept.	203.5	388.2	516.7	886.6	799.9
39	Information and Public Relations	24.7	67.5	62.8	83.5	70.5
40	Judicial Dept[30]	32.2	59.0	77.0	104.0	90.0
	Total Gap after 20 % reduction	54194.4	107758.8	111383.8	154046.2	133921.9
	Budget as per current allocation	180438.3	344130.2	458037.3	609647.7	514811.5
	Gap as a % of total Budget	30.0	31.3	24.3	25.3	26.0

[30] The estimate for the Judicial Dept. for the SDG period was carried out by the Center for SDGs on the basis 15th finance commission requirement with 10 % incremental increase till year 2030

SI No.	Dept.	2017-2019	2019-2022	2022-2025	2025-2028	2028-2030
	GAP after reduction of 20%(10% innovation;10%partnerships)					**Rs in Crore**
1	Panchayat and rural Development	571.4	-2853.8	-1210.4	2065.6	2071.6
2	Agriculture	4016.5	4458.4	4562.2	4539.4	4439.4
3	Animal Husbandry and Veterinary	262.0	510.4	679.3	904.2	763.5
4	Fisheries	1054.5	1159.9	1275.9	1403.5	1543.8
5	Health and Family Welfare	-646.4	-1052.7	1600.3	6838.1	8113.2
6	Public Health Engineering	2679.0	6896.4	-3820.0	-5183.4	-4432.9
7	NHM	571.8	761.0	1012.9	1348.2	1138.5
8	School Education	362.7	240.1	240.7	241.4	109.9
9	Higher Education	0.5	0.4	20.8	18.8	142.5
10	Technical Education	2.7	7.1	11.5	234.1	329.5
11	Non-formal & Adult Education	-40.5	-75.7	-100.8	-134.1	-113.3
12	Sports and Youth Welfare	-11.8	-13.0	-15.1	-16.6	-18.2
13	Social Welfare	-72.0	704.2	1190.4	728.0	871.8
14	Environment and Forests	1990.7	2903.6	3049.8	3201.0	4159.1
15	Soil Conservation	213.8	332.0	341.2	204.4	32.8
16	Information and Technology Department	1392.4	3414.9	2944.7	2548.3	2151.9
17	Public Works Roads Department	1763.0	2120.2	1174.6	-223.4	-1188.2
18	Irrigation	1231.6	8857.2	8045.4	9495.4	5468.0
19	Home & Political Dept.	-415.3	1045.8	5341.8	13120.8	15759.8
20	Water Resources (Flood Control)	1186.4	9216.8	9588.7	11976.5	7190.2
21	Border Protection &Development Department	10.1	-71.5	-169.3	-298.1	-206.0
22	Handloom & Textile	89.8	171.2	200.9	303.4	256.2
23	Power	11066.2	10101.3	5832.0	7234.9	6109.4
24	Science & Technology	-14.0	160.2	-2.5	-26.0	-42.8
25	Food Civil Supplies and consumer affairs	-231.7	-718.4	-956.1	-1272.6	-1074.7
26	Bodoland Territorial Council	1351.3	6796.4	10747.1	15552.7	12883.1
27	Industry and Commerce	146.7	279.8	372.4	495.7	418.6
28	Welfare of Minorities and Development	-179.0	-340.2	-417.0	-493.1	-362.6
29	General Admin. Dpt.	-79.8	-215.6	-287.0	-381.9	-296.1
30	Skill, Employment and	30.0	28.0	-257.2	-192.5	-96.5

SI No.	Dept.					
	Entrepreurship					
31	Transport Dept.	64.8	208.6	184.2	184.5	113.1
32	Guwahati Development dept.	-8.1	-20.8	-27.4	-39.5	-36.3
33	Excise Dept.	1.1	1.7	1.8	1.9	1.3
34	Cooperation	0.4	0.4	-1.6	-3.4	-3.2
35	Mines and Minerals Dept.	-2.7	10.7	-6.3	-11.4	-10.0
36	Urban Development Dept.	636.3	294.6	-802.2	-626.2	-979.8
37	IT Dept.	-29.7	4445.6	3808.6	3109.4	2222.8
38	Hill Area Dept.	-23.6	-45.0	-59.8	79.5	108.1
39	Information and Public Relations	6.0	27.7	15.1	20.1	17.0
40	Judicial Dept.[31]	-207.3	-376.8	-503.0	-668.2	-562.0
	Total Gap after 20 % reduction	28739.6	59371.2	53606.6	76279.0	66992.5
	Budget as per current allocation	180438.3	344130.2	458037.3	609647.7	514811.5
	Gap %	15.9	17.3	11.7	12.5	13.0

GAP after reduction of 40%(20% innovation;20%partnerships)						Rs in crore
SI No.	Dept.	2017-2019	2019-2022	2022-2025	2025-2028	2028-2030
1	Panchayat and rural Development	-4766.2	-9054.6	-10110.8	-10699.8	-8789.8
2	Agriculture	2636.8	2930.8	2967.4	2904.8	2779.8
3	Animal Husbandry and Veterinary	193.4	377.0	501.7	667.8	563.9
4	Fisheries	748.1	822.9	905.1	995.7	1095.2
5	Health and Family Welfare	-1837.3	-5701.0	-5335.7	-3569.2	-1261.6
6	Public Health Engineering	1734.0	4170.4	-4198.6	-5662.6	-4823.5
7	NHM	-997.1	-1327.1	-1766.3	-2351.0	-1985.3
8	School Education	225.9	129.3	124.7	119.6	14.9
9	Higher Education	-4.9	-4.4	9.9	8.9	100.5
10	Technical Education	0.9	4.1	7.3	174.1	245.5
11	Non-formal & Adult Education	-67.5	-126.2	-168.0	-223.6	-188.8
12	Sports and Youth Welfare	-23.4	-25.7	-28.9	-31.8	-35.0
13	Social Welfare	-492.0	46.4	362.8	-37.0	12.6
14	Environment and Forests	3826.8	5326.2	2291.2	8486.4	11208.4
15	Soil Conservation	118.6	203.0	205.4	97.8	-36.4

[31] The estimate for the Judicial Dept. for the SDG period was carried out by the Center for SDGs on the basis 15th finance commission requirement with 10 % incremental increase till year 2030

#	Department					
16	Information and Technology Department	927.6	2388.8	2080.3	1793.2	1514.3
17	Public Works Roads Department	-354.0	-1606.6	-3373.8	-5830.8	-5673.4
18	Irrigation	550.2	6157.4	5402.8	6300.8	3116.0
19	Home & Political Dept.	-2902.8	-4157.4	-2571.4	1085.6	4426.6
20	Water Resources (Flood Control)	354.1	5891.1	5831.9	7172.7	3864.4
21	Border Protection &Development Department	-34.3	-133.5	-233.3	-365.1	-274.0
22	Handloom & Textile	6.8	13.0	-9.7	23.1	19.5
23	Power	7484.1	6804.6	2971.6	3559.5	3005.8
24	Science & Technology	903.9	2388.8	2080.3	1793.2	1514.3
25	Food Civil Supplies and consumer affairs	-463.3	-1197.3	-1593.6	-2121.0	-1791.1
26	Bodoland Territorial Council	916.2	5035.3	8037.6	11695.9	9726.7
27	Industry and Commerce	-0.2	-0.3	-0.4	-0.6	-0.5
28	Welfare of Minorities and Development	-508.7	-979.5	-1276.9	-1653.1	-1355.6
29	General Admin. Dpt.	-113.9	-264.8	-352.4	-469.0	-369.6
30	Skill, Employment and Entrepreurship	-92.2	-310.7	-720.7	-833.7	-654.5
31	Transport Dept.	38.4	137.9	113.5	105.4	57.0
32	Guwahati Development dept.	-20.1	-52.0	-69.0	-94.2	-81.7
33	Excise Dept.	0.7	1.0	0.9	0.9	0.5
34	Cooperation	-0.1	-0.5	-2.3	-4.0	-3.6
35	Mines and Minerals Dept.	-12.4	-12.1	-31.5	-44.2	-37.6
36	Urban Development Dept.	206.1	-766.1	-1915.4	-2218.4	-2211.6
37	IT Dept.	-59.4	3279.5	2783.7	2235.1	1585.2
38	Hill Area Dept.	-250.7	-478.1	-636.3	-727.6	-583.7
39	Information and Public Relations	-12.8	-12.2	-32.5	-43.3	-36.5
40	Judicial Dept.[32]	-446.7	-812.6	-1083.0	-1440.4	-1214.0
	Total Gap after 40 % reduction	7412.7	19084.8	1167.6	10800.2	13443.5
	Budget as per current allocation	180438.3	344130.2	458037.3	609647.7	514811.5
	Gap %	4.1	5.5	0.3	1.8	2.6

[32] The estimate for the Judicial Dept. for the SDG period was carried out by the Center for SDGs on the basis 15th finance commission requirement with 10 % Incremental increase till year 2030

Conclusions

Assam Agenda 2030 as discussed in these preceding nine chapters covers all seventeen of the Sustainable Development Goals as relevant for Assam. Some SDGs (such as SDG 14 – life below water, SDG 17– Partnerships, etc.) and targets within them have been reinterpreted to address the state's concerns. Some have been assigned more focus than others for the same reason and to make the document more relevant to serve the needs of the state. As indicated in the Introduction, Assam Agenda 2030 is expected to be a live document with improvements made as necessary: the indicators used may be augmented and amended to be more relevant and useful when more data becomes available, for instance; or new interventions and actions introduced when they become necessary.

It is critical that these nine chaptersand the interventions and actions prioritized under them be acted upon by all concerned departments working together seamlessly with the lead department as indicated under each chapter taking a coordinating role in order to synchronize actions synergistically cutting across departmental silos and avoiding unnecessary duplications and overlaps.

In course of time Assam Agenda 2030 could be filtered down to district and sub-district levels such as to Panchayati Raj Institutions and Urban Local Bodies where it could act as a guide to setting local priorities for establishing their own local Agendas 2030 to achieve the SDGs. This would make this document more useful and relevant for achieving the sublime and far reaching vision of Assam 2030.

Abbreviations

AAA	Atal Amrit Abhiyan
AAA	Academic and Administrative Audit
AASC	Assam Administrative Staff College
ACCMS	Assam Climate Change Management Society
AEDA	Assam Energy Development Agency
AFL	Assam Fund for Life
AHSEC	Assam Higher Secondary Education Council
AHTU	Anti Human Trafficking Unit
AIDC	Assam Industrial Development Corporation
AIDS	*Acquired Immune Deficiency Syndrome*
AIIDC	Assam Industrial Infrastructure Development Corporation
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AMTRON	Assam Electronics Development Corporation Limited
APART	Assam Project on Agri-business for Rural Transformation
APDCL	Assam Power Distribution Corporation Limited
APMC	Agricultural Produce Market Committee
ARSAC	Assam Remote Sensing Application Centre
ASER	Annual Status of Education Report
ASHA	Accredited Social Health Activist
ASIDC	Assam Small Industries Development Corporation
ASTEC	Assam Science, Technology and Environment Council
ANM	Auxiliary Nurse Midwife
AT&C	Aggregated Technical and Commercial
ATPO	Assam Trade Promotion Organization
AWC	Anganwadi Centres
AYUSH	Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy

BMC	Biodiversity Management Committe
BSNL	Bharat Sanchar Nigam Limited
CADWM	Command Area Development and Water Management
CBO	Community Based Organisations
CCAI	Calculated Carbon Aromacity Index
CCS	Carbon Corporate Storage
CCTV	Closed-Circuit Television
CCTNS	Crime and Criminal Tracking Network and Systems
CHS	Community Health Center
CHS	Custom Hiring Service
CD	Credit Deposit
CID	Crime Investigation Department
CMSGUY	Chief Minister's Samagra Gramya Unnayan Yojana
CNA	Central Nodal Agencies
CN	Compressed Natural Gas
CTLC	City Level Technical Committee
CSO	Central Statistics Office
CSR	Corporate Social Responsibility
CVD	Cardio Vascular Disease
DEM	Digital Elevation Model
DES	Directorate of Economics and Statistics
DLSA	District Legal Services Authority
EAP	Employee Assistance Program
EDI	Educational Development Index
ECE	Early Childhood Education
ECI	Election Commission of India
EDL	Essential Drug List
EHP	Essential Health (Services) Package
ERP	Enterprise Resource Planning
ESDM	Electronics System Design & Maintenance
EWS	Economically Weaker Section
EV	Electric Vehicle

FAR	Floor Area Ratio
FRA	Forest Rights Act
FSI	Floor Space Index
GDP	Gross Domestic Product
GER	Gross Enrollment Ratio
GHG	Green House Gas
GIS	Geographic Information System
GMC	Guwahati Municipal Corporation
GMDA	Guwahati Metropolitan Development Authority
GPR	Government Process Reengineering
GPS	Global Positioning System
hp	Horse Power
HIM	Health Information Management
HIV	*Human Immunodeficiency Virus*
HMIS	Health Management Information System
HMNEH	Horticulture Mission for North East and Himalayan Region
HOV	High Occupancy Vehicle
HSD	High Speed Diesel
HUDC	Housing and Urban Development Cooperation
IAPPD	Integrated Action Plan for Prevention and Control of Pneumonia and Diarrhea
ICMR	Indian Council of Medical Research
ICT	Information and Communications Technology
IEC	Information Education and Communication
IIT	Indian Institution of Technology
IHR	International Health Regulation
IMC	Indian Major Carps
IMR	Infant Mortality Rate
INDC	Intended Nationally Determined Contributions
IIPC	Industry Institute Partnership Cell
IPHS	Indian Public Health Standards
ISTM	Institute of Secretariat Training and Management

IWRM	Integrated Water Resources Management
Kbps	Kilobits per second
km	Kilometre
KNP	Kaziranga National Park
LED	Light Emitting Diode
LiDAR	Light Detection And Ranging
LHV	Lady Health Visitor
LMP	Licensed Medical Practitioners
LPG	Liquefied Petroleum Gas
LPI	Leadership Practice inventory
MACT	Motor Accident Claims Tribunal
Mbps	Megabits per second
MCTS	Mother and Child Tracking System
MDG	Millennium Development Goals
M&E	Monitoring and Evaluation
MHRD	Ministry of Human Resource Development
MMR	Maternal Mortality Ratio
MNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MOITRI	Mission for Overall Improvement of Thana for Responsive Image
MOSPI	Ministry Of Statistics and Programme Implementation
MoU	Memorandum of Understanding
MOVCD	Mission Organic Value Chain Development
MS	Motor Spirit
MSME	Micro,Small and Medium Enterprises
MSP	Minimum Support Price
MW	Mega Watt
NAAC	National Assessment and Accreditation Council
NABARD	National Bank for Agricultural and Rural Development
NAFCC	National Adaptation Fund for Climate Change
NAM	National Agriculture Market
NATS	National Apprenticeship Training Scheme
NCGTC	National Credit Guarantee Trustee Company Limited

NCRP	National Cancer Registry Program
NECCE	National Early Childhood Care and Education
NFHS	National Family Health Survey
NER	Net Enrollment Ratio
NERS	National Emergency Response System
NCD	Non Communicable Disease
NGO	Non Government Organisation
NHB	National Housing Bank
NIC	National Informatics Centre
NIPFP	National Institute of Public Finance and Policy
NOFN	National Optical Fibre Network
NRLM	National Rural Livelihood Mission
NTFP	Non-Timber Forest Products
NULM	National Urban Livelihood Mission
NWMP	National Water Quality Monitoring Programme
LCEC	Low Carbon Emission Concrete
LIG	Low Income Group
OBC	Other Backward Classes
ODA	Official Development Assistance
O&M	Operation and Management
OOSC	Out of School Children
OSC	One Stop Centers
PCB	Pollution Control Board
PCMA	Prevention of Child Marriage Act
PBR	People's Biodiversity Registers
PWEPA	Population and Women's Empowerment Policy of Assam
PGR	Professional Grazing Reserve
PHC	Public Health Center
PMAY	Pradhan Mantri Awas Yojana
PMFBY	Pradhan Mantri Fasal Bima Yojana
PMKSY	Pradhan Mantri Krishi Sinchaye Yojana
PKVY	Paramparagat Krishi Vikash Yojana

PLV	Para Legal Volunteer
PPP	Public-Private Partnerships
PRI	Panchayati Raj Institution
PS	Police Station
PwD	Persons with Disabilities
PWSS	Piped Water Supply System
RKSK	Rashtriya Kishor Swasthya Karyakram
RMSA	Rashtriya Madhyamik Shiksha Abhiyan
RPWD	Rights of Persons with Disabilities
RTI	Right To Information
PTR	Pupil Teacher Ratio
RTO	Regional Transport Office
SAPCC	State Action Plan for Climate Change
SCADA	Supervisory Control and Data Acquisition
SEBA	Secondary Education Board Assam
SC	Sub Centers
SC/ST	Scheduled Caste/Scheduled Tribe
SFC	State Finance Commission
SFM	Sustainable Forest Management
SGDP	State Gross Domestic Product
SHC	Soil Health Card
SHG	Self Help Group
SIDBI	Small Industries Development Bank of India
SIPRD	State Institution of Panchayat and Rural Development
SJPU	Special Juvenile Police Unit
SMS	Short Message Service
SNCU	Sick New born Care Unit
SOP	Standard Operation Procedure
SLTC	State Level Technical Committee
SPAP	Strategic Paper and Action Plan
SRI	System of Rice Intensification
SRHR	Sexual and Reproductive Health and Rights

SSA	Sarva Shiksha Abhiyan
STF	Special Task Force
STS	Secretariat Training School
SWM	Solid Waste Management
TDR	Transfer of Development Rights
TES	Total Environmental Rural Sanitation
TISS	Tata Institute of Social Sciences
T&V	Training and Visit
TGL	Tea Garden Labor
TS	Traditional Knowledge
TTI	Teacher's Training Institution
ULB	Urban Local Bodies
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational scientific and Cultural Organization
UNICEF	United Nations Children's Fund
UNIDO	United Nations Industrial Development Organization
UT	Union Territory
UTP	Under Trial Prisoners
V&AT	Vigilance and Anti Corruption
VAW	Violence Against Women
VFX	Visual Effects
VGR	Village Grazing Reserve
VHND	Village Health Nutrition Day
VHSNC	Village Health Sanitation and Nutrition Committee
VLMCC	Village Level Management and Conservation Committee
VLSI	Very Large Scale Integration
VSBK	Vertical Shaft Brick Kiln
WASH	Water Sanitation and Hygiene
WHO	World Health Organization
WTI	Wildlife Trust of India
WUA	Water Users' Association

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Goal 1: End poverty in all its forms everywhere

This goal focuses on removing all forms of poverty over the next 15 years. It resolves that all people, everywhere, should enjoy a basic standard of living including social protection benefits for the most vulnerable. It also focuses on ensuring that people harmed by conflict and natural hazards receive adequate support, including access to basic services.

Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Goal 2 seeks sustainable solutions to end hunger in all its forms by 2030 and to achieve food security. The aim is to ensure that everyone everywhere has enough good-quality food to lead a healthy life. Achieving this Goal will require better access to food and the widespread promotion of sustainable agriculture. This entails improving the productivity and incomes of small-scale farmers by promoting equal access to land, technology and markets, sustainable food production systems and resilient agricultural practices. It also requires increased investments through international cooperation to bolster the productive capacity of agriculture in developing countries.

Goal 3: Ensure healthy lives and promote well-being for all at all ages

Goal 3 seeks to ensure health and well-being for all, at every stage of life. The aim is to improve reproductive and maternal and child health; end the epidemics of HIV/AIDS, malaria, tuberculosis and neglected tropical diseases; reduce non-communicable and environmental diseases; achieve universal health coverage; and ensure universal access to safe, affordable and effective medicines and vaccines. It aims to support research and development in health sector, increase health financing, and strengthen capacities to reduce and manage health risks.

Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Goal 4 aims to ensure that all people have access to quality education and lifelong learning opportunities. The Goal focuses on the acquisition of foundational and higher-order skills at all stages of education and development; greater and more equitable access to quality education at all levels as well as technical and vocational education and training (TVET); and the knowledge, skills and values needed to function well and contribute to society.

Goal 5: Achieve gender equality and empower all women and girls

Empowering women and girls to reach their full potential requires that they have equal opportunities to those of men and boys. This means eliminating all forms of discrimination and violence against them, including violence by intimate partners, sexual violence and harmful practices, such as child marriage. Ensuring that women have better access to paid employment, sexual and reproductive health and reproductive rights, and real decision-making power in public and private spheres will further ensure that development is equitable and sustainable.

Goal 6: Ensure availability and sustainable management of water and sanitation for all

Sustainable Development Goal 6 goes beyond drinking water, sanitation and hygiene to also address the quality and sustainability of water resources, critical to the survival of people and the planet. The 2030 Agenda recognizes the centrality of water resources to sustainable development, and the vital role that improved drinking water, sanitation and hygiene plays for progress in other areas, including health, education and poverty reduction.

Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

This Goal focuses on access to affordable, reliable and sustainable energy for achieving the Sustainable Development Goals – from poverty eradication via advancements in health, education, water supply and industrialization to mitigating climate change.

Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 8 focuses on the need for sustained and inclusive economic growth as a prerequisite for sustainable development, which can contribute to improved livelihoods for people around the world. Economic growth can lead to new and better employment opportunities and provide greater economic security for all. Moreover, rapid growth, will assist in reducing the wage gap relative to developed countries, thereby diminishing glaring inequalities between the rich and poor.

Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

Sustainable Development Goal 9 addresses three important aspects of sustainable development: infrastructure, industrialization and innovation. Infrastructure provides the basic physical facilities essential to business and society; industrialization drives economic growth and job creation, thereby reducing income inequality; and innovation expands the technological capabilities of industrial sectors and leads to the development of new skills.

Goal 10: Reduce inequality within and among countries

Goal 10 calls for reducing inequalities in income as well as those based on sex, age, disability, race, class, ethnicity, and religion. The Goal also addresses issues related to representation and development assistance, safe migration especially in relation to conflicts and natural disasters. It also highlights the growing income inequality which requires to give more opportunities to the poorest and most marginalised communities.

Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable

Goal 11 focuses on developing safe and sustainable cities and communities. Today, more than half the world's population lives in cities. By 2030, it is projected that 6 in 10 people will be urban dwellers. Despite numerous planning challenges, cities offer more efficient economies of scale on many levels, including the provision of goods, services and transportation. With sound, risk-informed planning and management, cities can become incubators for innovation and growth and drivers of sustainable development.

Goal 12: Ensure sustainable consumption and production patterns

Sustainable Development Goal 12 encourages more sustainable consumption and production patterns through various measures, including specific policies and for the management of materials that are toxic to the environment. Sustainable growth and development requires minimizing the use of natural resources and toxic materials, and reducing and recycling the waste and pollutants generated, throughout the entire production and consumption process.

13 CLIMATE ACTION

Goal 13: Take urgent action to combat climate change and its impacts
. Goal 13 calls for urgent action not only to combat climate change and its impacts, but also to build resilience in responding to climate-related hazards and natural disasters. Climate change presents the single biggest threat to development, and its widespread, unprecedented effects disproportionately burden the poorest and the most vulnerable

14 LIFE BELOW WATER

Goal 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Goal 14 focuses on marine resources which are particularly important for people living in coastal communities, who represented 37 per cent of the world population in 2010. Oceans provide livelihoods, subsistence and benefits from fisheries, tourism and other sectors. They also help regulate the global ecosystem by absorbing heat and carbon dioxide (CO_2) from the atmosphere. However, oceans and coastal areas are extremely vulnerable to environmental degradation, overfishing, climate change and pollution.

15 LIFE ON LAND

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

Goal 15 focuses specifically on managing forests sustainably, halting and reversing land and natural habitat degradation, and stopping biodiversity loss. All these efforts combined aim to ensure that the benefits of land-based ecosystems, including sustainable livelihoods, will be enjoyed for generations to come.

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

Goal 16: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels

Central to the 2030 Agenda for Sustainable Development is the need to promote peaceful and inclusive societies based on respect for human rights, the rule of law and transparent, effective and accountable institutions. Many regions still face protracted violence and armedconflict, and far too many people are poorly supported by weak institutions and lack access to justice, information and other fundamental freedoms. This goal focuses on creating effective, inclusive and transparent systems to build strong institutions which promote peace and justice.

Goal 17: Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

Goal 17 focuses on building partnerships for achieving all the goals by 2030 through partnership that brings together Governments, civil society, the private sector, the United Nations system and other actors, mobilizing all available resources. Meeting implementation targets through proper planning, capacity building, technological inputs and monitoring systems, is key to realizing the Agenda 2030.