

## The 2030 Sustainable Development Goals and their applicability to Economic Progress in Rural North Coastal Andhra Pradesh

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### Abstract

The famous phrase, "Think globally, act locally" was introduced in 1915 by the Scottish planner and conservationist, Patrick Geddes. Exactly after one hundred years, the Sustainable Development Goals (SDGs) were set up in 2015 by the United Nations General Assembly (UN-GA) as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. It is planned globally that the development must balance social, economic and environmental sustainability, eradicate poverty in all forms and create a thriving world where every person lives to the fullest everyday.

Now the challenge is to achieve these global goals locally. Whilst countries have begun efforts towards achieving these goals, there is a need to study, analyse and evaluate the practical aspects of the applicability of these goals to populations that are region specific. This study will be critical to frame region specific policies and development strategies that are suitable to the people therein and their development. The interest of this paper is in line with this assertion: to find the synergy and the applicability of the Sustainable Development Goals to the sustainable progress of the "Rural North Coastal Economy" in the state of Andhra Pradesh. Thus this paper aims to give a local perspective to a global cause and proposes policy frameworks and measures to achieve the Sustainable Development Goals.

The present study starts with some introduction of SDGs, including the basis for the UN SDGs, the formation of the UN SDGs, Rural population and the rural blend of the North Coastal Andhra Pradesh. A rural coastal economic framework was pictorially represented. The need for synergy between UN SGOs and North Coastal Andhra Pradesh Economy is presented. The key propositions, opportunities and threats to achieve the UN adopted 17 SDGs in the regions of North Coastal Andhra Pradesh are briefly outlined. The same are summarised in a tabular form at the end.

**Keywords:** *Sustainable Development Goals, United Nations, economic progress, rural coastal population, sustainability*

### 1. Introduction

*The United Nations Sustainable Development Goals:* The world is at the brink of a global transformation. The international community, through the United Nations (UN) Organisation (UNO), has set in motion a historic plan with 17 Sustainable Development Goals (SDGs) that aim to build a more prosperous, more equal, and more secure world by the year 2030 [1]. The 17 SDGs encompassed with 169 targets are part of the 2030 Agenda for sustainable global development [2]. This was adopted by 193 member states at the UN General Assembly Summit in September 2015, and which came into effect on 1 January 2016. These goals are the result of an unprecedented consultative process that brought national governments and millions of citizens from across the globe together to negotiate and adopt the global path to sustainable development for the next 15 years. At the core of this global agenda for 2030 is the principle of universality: 'Leave No One Behind' [3]. It is critical to the implementation of these targets that they should be relevant to all governments and actors. Development in all its dimensions must be inclusive of all people,

everywhere, and should be built through the participation of everyone, especially the most vulnerable and the marginalised [4]. It is very apt to mention at this juncture that the UN SDGs are directly inline with the vision and tireless efforts of Bhimrao Ambedkar, the Father of the Indian Constitution, towards ensuring excluded groups were politically, socially and economically empowered. The UN Development Programme Administrator Achim Steiner has categorically stated that Ambedkar's vision of equality and social justice echoes the ambitions of the UN's 2030 development agenda [6].

**1.1 The Basis for the UN SDGs:** The SDGs build on tremendous work by countries and the UN including the UN Department of Economic and Social Affairs. In June 1992, at the Earth Summit in Rio de Janeiro, Brazil, more than 178 countries adopted Agenda 21, a comprehensive plan of action to build a global partnership for sustainable development to improve human lives and protect the environment [7]. The Member States unanimously adopted the Millennium Declaration at the Millennium Summit in September 2000 at UN Headquarters in New York. The Summit led to the elaboration of eight Millennium Development Goals (MDGs) to reduce extreme poverty by 2015 [8, 9]. By adopting these plans, the industrialised countries recognized that they have a greater role in cleaning up the environment than poor nations, who produce relatively less pollution. The Johannesburg Declaration on Sustainable Development and the Plan of Implementation, adopted at the World Summit on Sustainable Development in South Africa in 2002, reaffirmed the global community's commitments to poverty eradication and the environment, and built on Agenda 21 and the Millennium Declaration by including more emphasis on multilateral partnerships [10]. At the United Nations Conference on Sustainable Development (Rio+20) in Rio de Janeiro, Brazil, in June 2012, Member States adopted the outcome document "The Future We Want" in which they decided, inter alia, to launch a process to develop a set of SDGs to build upon the MDGs and to establish the UN High-level Political Forum on Sustainable Development. The Rio +20 outcome also contained other measures for implementing sustainable development, including mandates for future programmes of work in development financing, small island developing states and more.

**1.2 The formation of the UN SDGs:**In 2013, the General Assembly set up a 30-member Open Working Group to develop a proposal on the SDGs. In January 2015, the General Assembly began the negotiation process on the post-2015 development agenda. The process culminated in the subsequent adoption of the 2030 Agenda for Sustainable Development, with 17 SDGs at its core, at the UN Sustainable Development Summit in September 2015 [11]. The year was a landmark year for multilateralism and international policy shaping, with the adoption of several major agreements including the Paris Agreement on Climate Change (December 2015) and the 2030 Agenda for Sustainable Development with its 17 SDGs. Now, the annual High-level Political Forum on Sustainable Development serves as the central UN platform for the follow-up and review of the SDGs. The Division for Sustainable Development Goals (DSDG) in the United Nations Department of Economic and Social Affairs (UNDESA) provides substantive support and capacity-building for the SDGs and their related thematic issues, including water, energy, climate, oceans, urbanisation, transport, science and technology, the Global Sustainable Development Report (GSDR), partnerships and Small Island Developing States. DSDG plays a key role in the evaluation of UN system wide implementation of the 2030 Agenda and on advocacy and outreach activities relating to the SDGs. In order to make the 2030 Agenda a reality, broad ownership of the SDGs must translate into a strong commitment by all stakeholders to implement the global goals. DSDG aims to help facilitate this engagement.

It is good to mention here that the Government of India is strongly committed to the 2030 SDGs Agenda as evidenced by the statements of the Prime Minister Shri Narendra Modi, "These goals reflect our evolving understanding of the social, economic and environmental linkages that define our lives."

**1.3 Rural population:** The definition of “rural” differs by country, though it is usually used in contrast to “urban”. For instance, this word is defined based on population density in India according to the Reserve Bank of India as those areas with a population of less than 49,000 (their 3 to tier 6 cities). In Japan, it indicates an area other than “an area with over 5,000 people, which consists of each district with a population density of over 4,000 per square kilometre”. The definition is country specific. Moreover, due to the fact that the concept of “rural” varies from Asia to Africa, it is difficult to define it uniformly. Therefore, the use of “rural” (including fishing and mountain villages) as a relative concept to “urban”, based on social, economical, and natural conditions in each country may be most adequate. The term could also be used to describe areas where a majority of the residents are engaged in agriculture in a broad sense including livestock farming, forestry, and fisheries. In India, it is generally said that the rural areas house up to 70% of the country’s population.

**1.4 The rural blend of the North Coastal Andhra Pradesh:** India has got extensive coastline of about 7517 kilometres covering the states of Gujrat, Maharashtra, Goa, Karnataka, Kerala, Dama and Diu on the Western Coast, Lakshadweep group of island in the south western coast of India, Tamil Nadu, Puducherry, Andhra Pradesh, Odisha, West Bengal in the Eastern Coast and Andaman Nicobar group of islands in the southeastern coast of India. Taken altogether, India boasts of 5423 kilometre mainland and 2094 kilometre island territories of coastline [12, 13]. The spatial zone where land and sea interact is termed the coastal zone (or coastline). The state of Andhra Pradesh was formed on the first day of November, 1956 from the erstwhile Tamil Nadu and was reorganised in June 2014 to form a new Telangana state. The Andhra Pradesh state now has two regions as shown in Figure 1, Coastal Andhra and Rayalaseema.



Figure 1. The representative map of Andhra Pradesh and Telangana

It currently spans around 162975 square kilometres and boasts of the second longest coastline in India of about 974 kilometres. The Northern Coast region of Andhra Pradesh in India consists of the districts of East Godavari, Visakhapatnam, Vizianagaram, and Srikakulam which can be seen in Figure 1. The region is locally called Uttarandhra and Kalingandhra [14, 15]. There is no terrain that has such a dual advantage as do these coastal zones. This area is ever thriving as the land is rich in moisture and suitable for agriculture. Moreover, there is tremendous scope for fisheries development. North Andhra coastal zones are endowed with rich vegetation, large habitats of coral reefs, sand dunes, salt marshes, etc., which allow biotic and abiotic processes to thrive continuously. This zone assumes importance because of high productivity of its ecosystems and concentration of rural population. Coastal zones continuously vary their spatial model due to natural processes like storms, shoreline shifts, anthropogenic forces, etc. That is to say, the coastline is as beneficial to mankind as it is prone to environmental damages and disasters. Hence it is important to form

rigorous policies and implementation agendas to protect, cultivate and develop rural coastal regions. Careful management of this rich spatial zone is very critical for the socioeconomic development of the people within.

## **2. Motivation towards the present work:**

The author, (Professor James Stephen Meka), has been serving as Principal (highest ranking administrative position) of the Wellfare Institute of Science Technology and Management (WISTM), an engineering education institution located in the picturesque rural location of Pinagadi Village, Pendurthi Mandal, Visakhapatnam District, Andhra Pradesh since 2013.

This long standing tenure has given him the opportunity to interact and involve himself with thousands of students and parents who belong to the marginalised classes of the north coastal districts of Andhra Pradesh. He has seen firsthand the economic backwardness of the student households, the financial struggles and gender based discrimination parents undergo at their workplaces and the immense mental agony families, especially the students experience in their tender age due to financial disempowerment and economic stigmatisation.

On the other side, the author also serves as the coordinator of the “Unnat Bharat Abhiyan”, a flagship programme of the government of India and inspired by the vision of transformational change in rural development processes by leveraging knowledge institutions to help build the architecture of an Inclusive India. The Mission of Unnat Bharat Abhiyan is to enable higher educational institutions to work with the people of rural India in identifying development challenges and evolving appropriate solutions for accelerating sustainable growth. It also aims to create a virtuous cycle between society and an inclusive academic system by providing knowledge and practices for emerging professions and to upgrade the capabilities of both the public and the private sectors in responding to the development needs of rural India. Five rural villages in Pendurthi Mandal (Pinagadi, Gorapalli, Kotlavani palem, Rampuram, Karakavani palem) had been adopted by WISTM College under the leadership of the author to work towards transformative results in the lives of marginalised people.

The author has, in his capacity as an educational administrator and social issues campaigner, been able to make a difference in the lives of such marginalised people. He was able to create awareness for stoppage of open defecation in many villages in Pendurthi mandal. He could get constructed in-house toilets in five villages. He received appreciation Award from the Govt. of Andhra Pradesh in recognition of his efforts in the rural villages. He is instrumental in holding regular awareness camps for sanitation and clean water.

The author has always motivated marginalised students of rural backgrounds to work in innovative projects that improve the standard of living of people in these rural areas. Along this line, he was instrumental in developing and donating electronic egg incubators and smart water taps to many village panchayats. His relentless efforts in uplifting the unprivileged and marginalised students have tangible results. One in many achievements is that the students of WISTM, under his mentorship, have stood as the National Champions in the AICTE Smart India Hackathon 2018. As part of this event, they developed Smart Systems for Sustainable Lives hence improve quality of living. They competed with premier institutes like IITs, NITs and Central Universities and stood India's number one. This achievement proved what these unprivileged marginalised students can do if proper motivation is given and opportunities are created.



**Fig 2: The SIH - 2018 winning team, WISTM Students receiving one lac cheque**

The author has gotten number of opportunities to closely follow the administrative, executive policies and mechanisms followed in rural villages and observe the need for sanitation and clean water and the dire requirement for healthy agricultural practices for good crop produce. Moreover being born in the north coastal district of East Godavari has given him the vantage point of directly seeing the economic problems of the people belonging to both the agricultural and fisheries sectors.

Despite the state and central governments making committed efforts to uplift the economic status of households by means of welfare schemes and subsidies, the author is of the strong opinion that there is still a tremendous need to have a sustainable development framework to improve and equalise the living conditions of households. He has observed that there is a need for, (a) providing quality education at an affordable price, (b) creating education-cum-skill based equal employment opportunities where everyone earns and eats, (c) encouraging entrepreneurship and start-ups from amongst rural students in rural areas, (d) developing a sanitised environment for healthy living conditions, and (e) creating awareness on healthy agricultural practices. The UN SDGs echo these concerns and observations in a way truly and wholly conformant to author's convictions - that there should be no one who cannot read or write, no one who sleeps without a meal and no one who commits suicide due to poverty.

Therefore the author chose to study the impact and applicability of the SDGs on the marginalised sectors of the North Coastal Andhra Pradesh. His involvement with rural people over many years puts him at a vantage point to conduct extensive study, perform correlation and analytic analysis and propose local level policy decisions that achieve the global SDG outcomes in an execution-friendly manner.

### **3. A Framework of Rural Coastal Economies:**

At the very beginning of this present work, we felt that it is very much necessary to understand the conceptual framework for the bio-economic local general equilibrium before getting into the synergy between UN SGDs and North Coastal Andhra Pradesh Economy. The households in the regions of rural coastal districts of East Godavari, Visakhapatnam, Vizianagaram and Srikakulam mainly depend on fishing and agriculture for their livelihoods. This framework is a feedback-loop like structure where the global market is dependent on the local market and vice versa via the

households in these regions. Figure 3 shows a pictorial representation of a rural coastal economic framework.

We have categorised the local households in the rural coastal regions into two categories. The first is those that belong to the fishing sector and the second is those that do not belong to the fishing sector. The households that do not belong to the fishing sector primarily depend on agriculture for their livelihood. These two categories are again subdivided into those that are economically backward and the wealthy. The wealthy section belonging to the fishing sector are majorly those that own boats and trade enterprises at the local and global level. It is most likely that this sector creates employment in the fishing sector in these rural regions. In order to achieve the UN SDG outcomes of equal opportunities and holistic and economic progress for all involved in the fishing sector, and especially the poor, it is important to maintain their economic status by providing tax benefits to increase their fish production and do more trade and thereby further improve the local and global economy. The economically weaker section of people belonging to the fishing sector mainly rely on fishing and selling their catch in the local markets. This section can be uplifted by creating income opportunities including procuring fishing equipment at subsidised prices and the opportunity to perform trade in the local market at minimum market price. The economically weaker section of people not belonging to the fishing sector mainly rely on agriculture. This section of people can be uplifted by providing them with agricultural capital and facilitating in procuring seeds, fertilisers and agricultural and irrigation equipment at subsidised rates. There has been a long standing demand to fix a minimum market price to their crops and aid direct farmer trade in the local markets. The wealthy section of people in this category are primarily the ones into trade of agricultural produce at the national and international level.

As shown in the figure 3, the wealthy facilitate global trade, propagate new technological advancements in both fishing and agriculture and create equal employment opportunities. The poor facilitate a thriving local market where the agricultural produce and the livestock like fish are sold to the people living therein. A strong policy framework within this feedback-loop structured global-local economy is the key for the sustainability and progress of the local economies. Within this structured framework, this paper correlates the global SDGs local districts of north coastal Andhra Pradesh and gives a descriptive analysis of the threats and policy solutions for holistic economic progress.

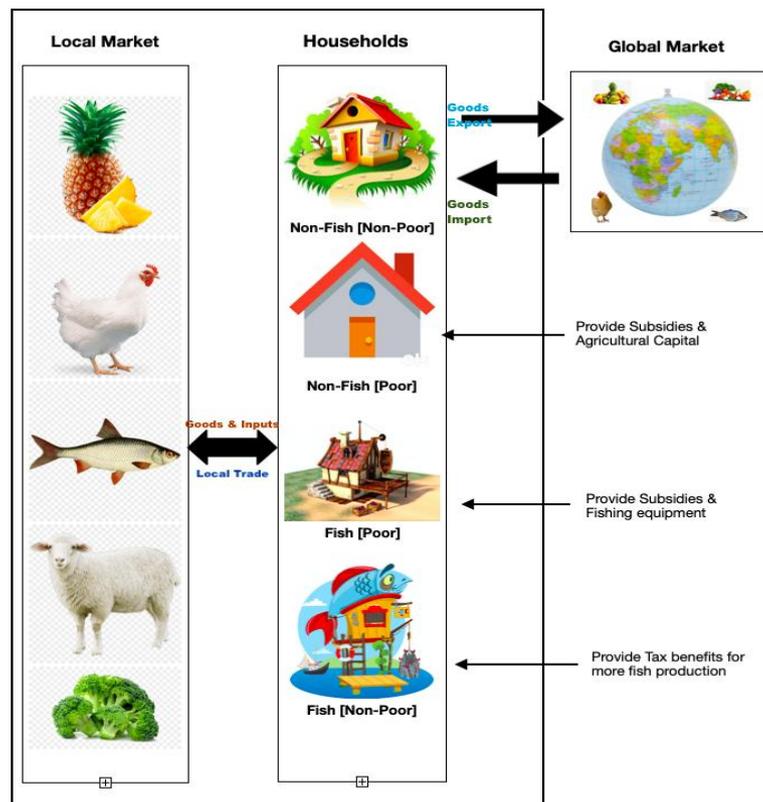


Figure 3. ARural Coastal Economic Framework

#### 4. The need for synergy between UN SDGs and North Coastal A.P. Economy:

Despite the ongoing global development, nearly 28 percent of India's population live in extreme poverty and struggle to meet basic needs such as health, education, and access to water and sanitation. In the north coastal districts of Andhra Pradesh, the Vizianagaram, Srikakulam and East Godavari districts are still categorised as poor with less than USD 1.25 per capita income [16]. The Visakhapatnam district has seen economic emergence with the establishment of port industries but there remains a lot more economic development to reach the lower rung of people in this region [17]. There is a need to find a synergetic means to apply and implement the UN adopted SDGs to North Coastal Andhra Pradesh, especially in the rural coastal regions to alleviate poverty and improve the standard of living. This paper outlines the practical aspects of policies and development strategies for the Rural North Coastal Andhra Pradesh population in line with SDGs, its applicability, inapplicability, opportunities and threats in the context of the targets and outcomes framed therein.

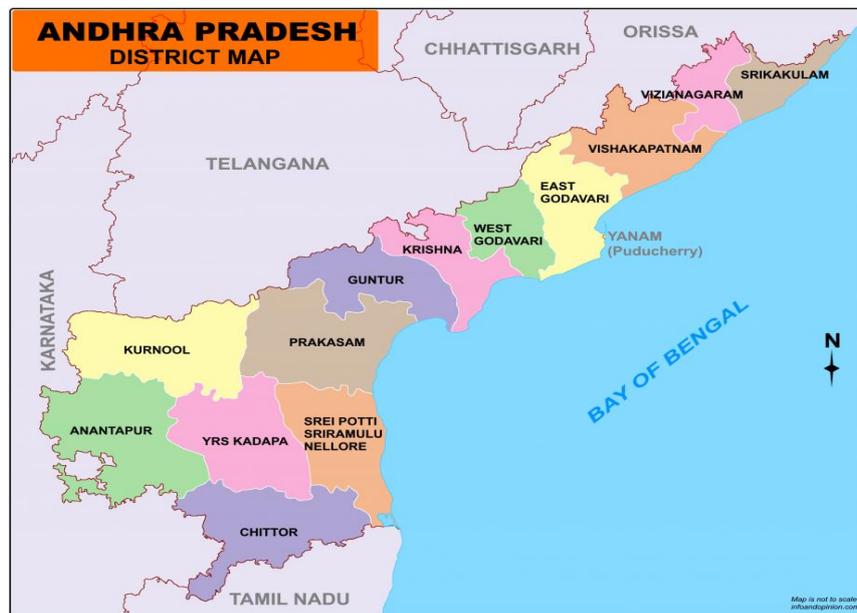


Figure 4. The map of Andhra Pradesh including the north coastal districts

#### 5. Synergy of SGDs with Economic Progress in North Coastal Andhra Pradesh

In this section, we briefly outline key propositions, opportunities and threats to achieve the UN adopted 17 SDGs in the regions of North Coastal Andhra Pradesh.

##### 5.1 SGD 1 - No Poverty

Extreme poverty remains prevalent in the north rural coastal regions of Andhra Pradesh despite the regions being rich in vegetation, fisheries and port trade. Without a significant shift in social policy, extreme poverty will dramatically increase by 2030. The UN SDG 1, one of the 17 Sustainable Development Goals established by the United Nations in 2015, calls for the end of poverty in all forms. Achieving this goal includes finding solutions to new threats caused by climate change and conflict. SDG 1 focuses not just on people living in poverty, but also on the services people rely on and social policy that either promotes or prevents poverty. The goal has seven targets and 13 indicators to measure progress. The five "outcome targets" are: eradication of extreme poverty; reduction of all poverty by half; implementation of social protection systems; ensuring equal rights to ownership, basic services, technology and economic resources; and the building of resilience to environmental, economic and social disasters. The two targets related to "means of achieving" SDG

1 are mobilisation of resources to end poverty; and the establishment of poverty eradication policy frameworks at all levels.

The causes of poverty in north coastal Andhra Pradesh, especially in the categorically poor East Godavari, Vizianagaram and Srikakulam districts include low income standards for employees and less support to agricultural and fisheries sectors. Economic development and an influx of jobs directly affects the poverty index. To improve the economic standard for employees, it is important to create jobs by encouraging local entrepreneurship and mobilising medium and small scale industries. The potential investment opportunities in the north coastal regions of Andhra Pradesh include ports, fisheries, tourism, transport, irrigation and water treatment, energy and gas. The corresponding development in recent years included 3 industrial hubs and 3 industrial corridors, 4 major ports and 4 airports, 32 special economic zones and several industrial parks [18]. What is important is to let the common man take full part in this progress and ensure strict adherence to policies and rules so the rich do not exploit the development scheme of the state and union governments.

A critical means to improve economic standard in the agricultural sector is to give minimum support price to farmers and create more avenues for direct trade thus reducing the impact of brokerage affairs that impair the assets of the farmers. It is striking that Visakhapatnam, fondly called the city of destiny, selected as one of the Smart Cities of India by the union government of India, has seen an upsurge of 741 slums housing nearly 8.42 lakh people [19]. The key to eradicate poverty and large economic differences in small spatial regions is to introduce extensive people welfare policies and ensure they benefit the utterly downtrodden of the society. Another critical aspect is to give small scale business subsidies and employment to these marginalised people and thus uplift their economic status.

In fisheries sector, the major step to eradicate poverty by means of explosion of fisheries trade was laid in 2015 by the Government of Andhra Pradesh, by effect of G.O.Ms.No.30, by identifying the fisheries sector as a growth engine for social economic development of the north coastal districts of Andhra Pradesh. The programme aimed to promote the rational exploitation and utilisation of the state's fishery resources in a manner consistent with the overall goal of sustainable development with a view to enhance the fish production to 42 lakh tones in the next five years from the then level of 19.64 lakh tones and to double the exports value from the present level of about Rs.16000 Crores. The main policy of this program is that the fisheries and aquaculture play a significant role in providing employment, reducing poverty and promoting health [20]. To this effect, the Visakhapatnam fishing harbour can be selected as an aqua hub to promote fish production by developing marine reserves and aqua life sanctuaries. These could enhance the already flourishing tourism trade in Visakhapatnam.

## **5.2 SGD 2 - No Hunger**

Globally, 1 in 9 people are undernourished, the vast majority of whom live in developing countries. Undernutrition causes wasting or severe wasting of 520 crore children worldwide. It contributes to nearly half (45%) of deaths in children under five – 30 lakh children per year. After decades of steady decline, the number of people who suffer from hunger, as measured by the prevalence of undernourishment, began to slowly increase again in 2015. Current estimates show that nearly 69 crore people are hungry, or 8.9 percent of the world population, up by 1 crore people in one year and by nearly 6 crore in five years. If recent trends continue, the number of people affected by hunger would surpass 84 crore by 2030 [21]. The UN SDG 2 aims to achieve Zero Hunger and end all forms of hunger and malnutrition by 2030, making sure all people—especially children—have sufficient and nutritious food all year. This involves promoting sustainable agriculture, supporting small-scale farmers and equal access to land, technology and markets. It also requires international

cooperation to ensure investment in infrastructure and technology to improve agricultural productivity.

In Andhra Pradesh, the underweight index has fallen from 33% in 2005-2006 to 32% in 2015-2016 among children less than 5 years old, and from 33% in 2005-2006 to 18% in 2015-2016 among women aged 15 - 49 years [22]. This index shows that there is a need to improve nutritious food for children. This can be done by implementing lunch schemes at government schools which have the dual advantage of educating as well as nourishing the children. We have conducted a survey with a sample size of 120 subjects in the Antarvedipalem Village in East Godavari district. The subjects are mothers in households having school going children. In this survey nearly 80% of the subjects voted for assertive schemes to provide food at subsidised rates to poor households to alleviate hunger. Increasing agricultural productivity and sustainable food production are crucial to help alleviate the perils of hunger.

### **5.3 SGD 3 - Good Health and Well-being**

The SDG 3 aims to ensure healthy lives and promote well-being for all at all ages. This SDG 3, specific to the north coastal districts of Andhra Pradesh, should focus on some critical targets. The first is to prevent child deaths. It is important to prevent child and mother deaths by upgrading the rural health centres in the villages of north coastal districts with good maternal health checkup and medical facilities. It is also important to ensure timely vaccination to children. Second, there should be extensive online awareness of transmissible diseases like AIDS and people should be encouraged safe sexual practices. Third, road safety is one very critical element to ensure the health and well-being of individuals.

The coastal districts of Andhra Pradesh, especially the villages around the coastline, have a high density of people. Hence the traffic density in these regions is also high. A majority of roads should be laid asphalt and modernised and traffic rules should be followed strictly to prevent road accidents and deaths. The mandatory use of helmets, introduced by the Government of Andhra Pradesh, is one small step towards a big goal to absolve all road related deaths by 2030. Fourth, with families becoming more nuclear, the elderly are left to fend for themselves. They fail to do so due to sickness and age. It is important to encourage the joint familial system, a traditional age old living system in Indian culture. The system also lets the elderly to tend to the children in the absence of the parents. While most families in the villages of north coastal Andhra Pradesh still remain joint, the cities have nearly become nuclear [23]. Finally, the most important aspect is to provide nutritious food to all people at all times. This can be achieved by increasing sustaining food production practices with rigorous vigilance and monitoring.

### **5.4 SGD 4 - Quality Education**

The SDG 4 ensures inclusive and equitable quality education and promotes lifelong learning opportunities for all. The SDG aims to provide children and young people with quality and easily accessible education plus other learning opportunities. One of its targets is to achieve universal literacy and numeracy.

The literacy rates in India and Andhra Pradesh for the year 2014 are listed in Figure 5. It can be seen that the state's literacy rate is not far from the national average. The relentless efforts of the former Chief Minister of Andhra Pradesh (Late) Shri YS Rajasekhara Reddy in giving free professional education to all poor people (see Figure 6) has turned upside the entire education fabric of Andhra Pradesh and the state is teeming with engineering and other course professionals ready to take a job [24, 25].

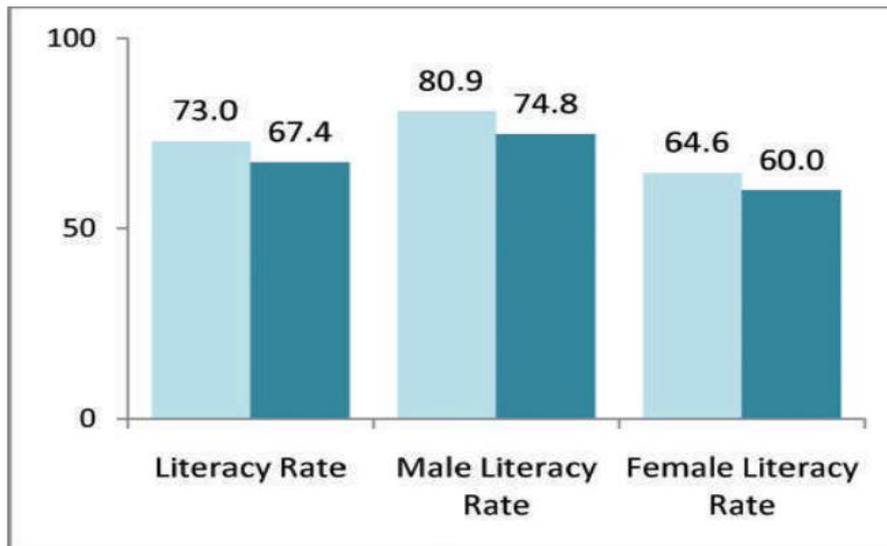


Figure 5. The literacy rate in India and Andhra Pradesh in the year 2014 according to the Government of Andhra Pradesh, “Demography” Report. The darker bar refers to Andhra Pradesh.

Despite an average of nearly 65% literacy rate, the rural coastal regions of Andhra Pradesh still suffer from the effects of illiteracy especially in children from the rural coastal districts. This problem can be alleviated by modernising and regulating the schools. There should be strict vigilance and monitoring of all amenities and educational facilities in schools. This would encourage parents to join their children in government regulated schools. Moreover, providing free breakfast and lunch will be a good means to attract children to study. Introducing night schools for the uneducated rural population, which can be densely seen in the tribal north coastal districts of Srikakulam and Vizianagaran will immensely help in eradicating illiteracy.



Figure 6. (Late) Shri YS Rajasekhara Reddy Former Chief Minister of Andhra Pradesh, giving full fees reimbursement to students.

### 5.5 SGD 5 - Gender Equality

The SDG 5 aims to achieve gender equality and empower all women and girls. Based on data from 87 countries, 1 in 5 women and girls under the age of 50 will have experienced physical and/or sexual violence by an intimate partner. It has been found that women do 2.6 times more unpaid care and domestic work than men [26]. While families, societies and economies depend on this work, for women, it leads to lower earnings and less time to engage in non-work activities. In addition to equal distribution of economic resources, which is not only a right, but accelerates development in

multiple areas, there needs to be a fair balance of responsibility for unpaid care work between men and women. Gender equality by 2030 requires urgent action to eliminate the many root causes of discrimination that still curtail women's rights in private and public spheres.

In the north coastal regions of Andhra Pradesh, especially in districts of East Godavari, Srikakulam and Vizianagaram, it is important for women to be given equal opportunity, right and reservation to compete with men in all forms of employment and entrepreneurship opportunities. In the most developed city of Visakhapatnam, it is important that women be given many opportunities to participate politically in direct and indirect electioneering. The most critical policy should be to consider giving school and college education to all girl students so they get to a vantage position of utilising their skills to empower themselves. The corporates and industrial managements in these regions should be regulated to follow equal gender employment ratio and should promote gender equal work culture within their organisation. The women should undergo training in self defence skills which can be tremendously helpful in time of need. It is needless to say that the UN SDG 5 aims to accomplish the vision of the Father of India Mahatma Gandhi who said, "The day a woman can walk freely on the roads at night, that day we can say that India has achieved independence." According to data collected from the Ministry of Women and Child Development, the percentage decrease of the number of crimes against women in Andhra Pradesh from 2014 to 2015 is 3.38 [28]. This indicates that the above proposed measures be strictly enforced to achieve women empowerment. This directly reflects an improved economic status to women and their families.

### **5.6 SGD 6 - Clean Water and Sanitation**

The SDG 6 aims to ensure availability and sustainable management of water and sanitation for all. In order to accelerate the efforts to achieve universal sanitation coverage and to put focus on sanitation, the Prime Minister of India launched the Swachh Bharat Mission (SBM) on 2nd October, 2014. SBM intends to make cities totally sanitised, healthy and liveable by deriving public health and environmental outcomes for all citizens with focus on hygiene and affordable sanitation for urban poor and women. The primary objective of the mission is the elimination of open defecation, achieving 100 per cent collection and scientific processing, disposal, re-use and recycling of municipal solid waste [29]. Swachha Andhra Corporation [30] was created in the year 2015 in line with the launch of Swachh Bharat mission at the national level. Thereafter, in June 2015 MoUD, GoI launched the Atal Mission for Rejuvenation and Urban Transformation (AMRUT) for urban renewal. The purpose of the mission is to provide basic infrastructure related to water supply, sewerage, urban transport and green spaces in the next 5 years. Under AMRUT, the Andhra Pradesh Government has proposed a plan for 31 cities and towns at an estimated cost of over Rs 28,756 crore.

The state of Andhra Pradesh is poised to become one of the first states of India to become an "Open Defecation Free" state. It has been observed by the Municipal Administration and Urban Development Department, Government of Andhra Pradesh that pollution load is quite high in the water bodies in north coastal regions primarily due to the direct disposal of the municipal sewerage. There is a need to create awareness in people on sanitation and the need to have in-house toilets [31].

### **5.7 SGD 7 - Affordable and Clean Energy**

The SDG 7 aims to ensure access to affordable, reliable, sustainable and modern energy for all. Electricity consumption is one of the most important indices that decide the development level of a nation. The per capita consumption of electricity in FY 2012-13 was 917 units, which is around 20% of that in China or 5% of the level in the USA. The Government of India is committed to improving the quality of life of its citizens through higher electricity consumption [32]. Our aim is to provide each household access to electricity, round the clock. The 'Power for All' programme is a major step in this direction (see Figure 7) [33]. In the first phase of the programme, Andhra

Pradesh has been chosen along with Rajasthan and Delhi. Since 2004, the performance of the power sector in Andhra Pradesh did not keep up pace with the development in other sectors resulting in increased energy deficit (17.6% in 2013). It is envisaged to cover the entire state under PFA programme in a phased manner and provide 24x7 power supply to all domestic, industrial and commercial consumers for all connected households by October 2016 and all un-connected households by March-2017.

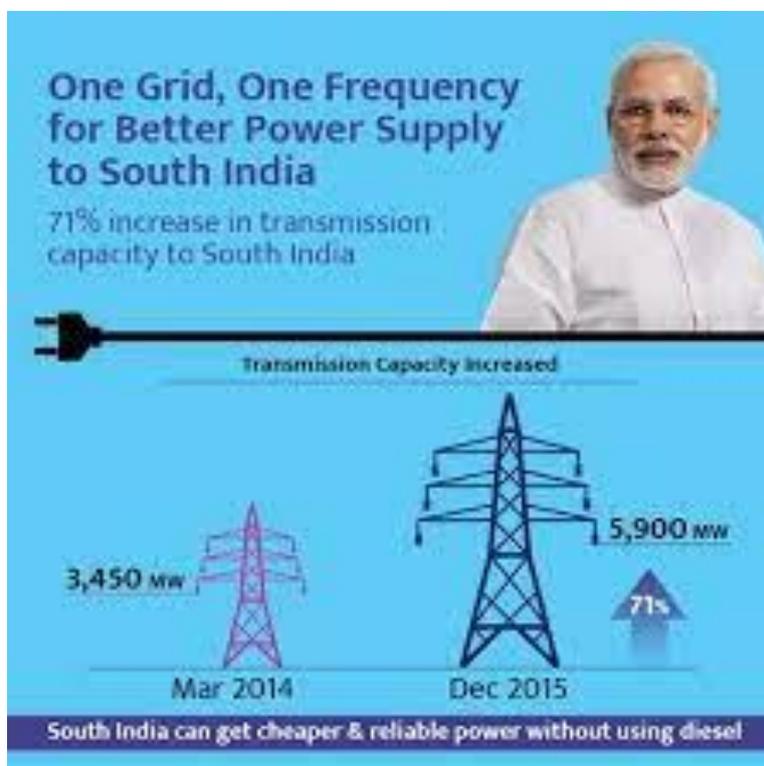


Figure 7. The “Power For All” initiative of the Government of India to echo the SDG 7.

The initiative of Power For All requires a rigorous renewable energy plan. The use of smart energy metres and automatic turn on and off of water and power supply should be introduced. Other technological advancements like introducing sleep mode to electrical appliances and using solar powered traffic lights ensure an efficient use of power and consequently allows for more consumers to reap the benefits of this initiative. In the transport sector, the use of diesel vehicles should be prohibited and electric ones should be rather strongly encouraged. The BS6 emission norms should be promoted in all vehicles. These measures will ensure clean and affordable energy to all users. The diesel motors used in the agricultural sector should be replaced with electric motors.

### 5.8 SGD 8 - Decent Work and Economic Growth

The SDG 8 aims to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. Over the past 25 years, the number of workers living in extreme poverty has declined dramatically despite the lasting impact of the 2008 economic crisis. In developing countries, the middle class now makes up more than 34% of the total employment, this number has nearly tripled from 1991 to 2015. However as the global economy continues to recover, we are seeing slower growth and widening inequalities. There are not enough jobs to keep up with the growing labour force. According to the International Labour Organisation, more than 20.4 crore people were unemployed in 2015 [34].

We propose that this SDG applies in generality to all regions. The generality is to promote local industries and employment sectors to create more job opportunities and create a healthy employment strategy to moderate employment opportunities with all genders, social and economic statuses. From the 2001 census [35], the employment percentage in the north coastal Andhra Pradesh districts can be seen in Table 1. The Srikakulam and East Godavari districts have more

people in the agricultural sector and hence there is a need to improve agricultural opportunities [28]. The economy in Visakhapatnam thrives from fisheries, port trade and industrial development and there is a large workforce of people employed in industries in this city. The data indicates there is a tremendous need to provide more employment opportunities to all people by promoting the local work opportunities.

District	Workers	Marginal workers	Non workers
Srikakulam	34.3	13.1	56.2
Vizianagaram	40.6	11.6	47.8
Visakhapatnam	34.7	7.8	58.2

**Table 1. The employment % in districts of north coastal Andhra Pradesh from 2001 census.**

### 5.9 SGD 9 - Industry, Innovation and Infrastructure

The SDG 9 aims to build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation. The key sectors that thrive in the rural north coastal Andhra Pradesh include vegetation, fisheries and port trade. In the fisheries sector, the major step to eradicate poverty by means of the explosion of fisheries trade was laid in 2015. The programme promotes the rational exploitation and utilisation of the state's fishery resources in a manner consistent with the overall goal of sustainable development with a view to enhance the fish production to 42 lakh tones in the next five years from the then level of 19.64 lakh tones and to double the exports value from the present level of about Rs.16000 Crores [20]. Additionally, the construction of flyovers and high rises to foster smooth and fast transport and increased business enterprise expansion. Since the rural north coastal districts of Andhra Pradesh are more prone to flooding and storms, more dams should be constructed and the high rises near the coastline should be made more storm resilient using green technologies.

### 5.10 SGD 10 - Reduced Inequality

The SDG 10 aims to Reduce income inequality within and among countries. This UN's 2030 Agenda for Sustainable Development, "Equality of opportunity development for all" at its heart is the shadow of its forerunner ideologies of Mahatma Gandhi and Bhimrao Ambedkar who made groundbreaking contributions towards reducing social and economic inequalities in India [36, 37]. Reducing inequalities and ensuring no one is left behind are integral to achieving the SDGs. Inequality within and among countries is a persistent cause for concern. Despite some positive signs toward reducing inequality in some dimensions, such as reducing relative income inequality in some countries and preferential trade status benefiting lower-income countries, inequality still persists.

The inequalities prevalent in rural north coastal districts of Andhra Pradesh relate to social and economic. The socially backward SC, ST and BCs are found to be backward economically also [38]. It is also known that the agricultural workers as a group are the most backward among economic groups. When the agricultural workers group is analysed, it is found that there are 36.4% SC households, 8.65% S.T. households and 44.74% B.C. households, the three groups together constituting 89.79% of the total agricultural workers' households. So, 90% of the most economically backward agricultural workers group is coming from socially backward groups (i.e.) S.C., S.T. and B.C. which means Economic backwardness and social backwardness are synonymous. But, social oppression is an additional burden for socially backward groups.

The biggest group involved in agricultural operations is the class of agricultural workers whose major income comes from working as hired workers on the land of others and at tasks outside crop

production. Most of them are landless. There are 56% landless households among agricultural workers in the state. Landless households among agricultural workers are 63% in south coastal Andhra, 55% in Rayalaseema and 53% in north coastal Andhra [38]. Welfare schemes relating to selling land at subsidised price to the marginalised landless people is one critical measure to reduce land based inequalities. The measures to reduce socio-economic inequalities include enhancing working rates, increasing wage rates, reducing gender discrimination and eradicating exploitation by contractors.

### **5.11 SGD 11 - Sustainable cities and communities**

The SGD 11 aims to make cities and human settlements inclusive, safe, resilient, and sustainable. The Andhra Pradesh north coastal districts comprise mostly of rural areas. However the cities like Kakinada, Rajahmundry, Visakhapatnam, Vizianagaram, etc. are there for development. Even the most developed city, Visakhapatnam, selected as one of the few smart cities of India has many slums. Adequate, safe, and affordable housing facilities and basic services to all people, especially for those near slums should be provided. Safe and affordable transport systems should be brought in place. Localities should be well equipped with health facilities like parks, recreation centres, open gymnasiums and there should be a local representative of the government to monitor and regulate the issues. The local body administrators like the counsellors and corporators should be more proactive in resolving people's issues.

### **5.12 SGD 12 - Responsible consumption and production**

The SDG 12 relates to ensuring sustainable consumption and production patterns. By 2019, 79 countries and the European Union have reported on at least one national policy instrument to promote sustainable consumption and production patterns. This was done to work towards the implementation of the “10-Year Framework of Programmes on Sustainable Consumption and Production Patterns”. Global fossil fuel subsidies in 2018 were \$400 billion This was double the estimated subsidies for renewables and is detrimental to the task of reducing global carbon dioxide emissions [39]. The following measures are critical to build a responsible consumption pattern of natural resources in the north coastal districts of Andhra Pradesh. The waste management should be improved. The dry and wet waste should be categorically separated and recycled. The consumption of pollution prone diesel motors and vehicles should be eradicated. Instead electric motors and vehicles should be encouraged. Subsidies should be given to these electric machines. Plastic waste should be discouraged and the plastic economy should be limited to industries. The use of refined and packaged foods should be discouraged and fresh organic foods should be encouraged. The government regulated prices on organic foods should be reduced and direct farmer trade with daily fresh supplies should be encouraged. As such these measures are not limited to north coastal Andhra Pradesh, but remain very critical for immediate focus in this coastline belt.

### **5.13 SGD 13 - Climate action**

The SDG 13 aims to take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy. Currently climate change is affecting the global community in every nation across the world. The impact of climate change not only impacts national economies, but also lives and livelihoods, especially those in vulnerable conditions. By 2018, climate change continued exacerbating the frequency of natural disasters, such as massive wildfires, droughts, hurricanes and floods. Over the period 2000–2018, the greenhouse emissions of developed countries in transitions have declined by 6.5%. However, the emissions of the developing countries are up by 43% in the period between 2000 and 2013. In 2019, at least 120 of 153 developing countries had undertaken activities to formulate and implement national adaptation plans [40].

The critical issues that need to be addressed in the Andhra Pradesh rural north coastal region in line with the SDG 13 include agricultural, coastal and industrial issues.

**Agriculture:** The potential climatic threats in this sector include the decrease in winter rainfall has a negative impact on winter crops [41] (Rabi crops), especially in the rainfed areas or East Godavari, the decrease in area under crops on account of insufficient rainfall, and the loss in fertility of soil in many areas due to excessive use of fertilisers and pesticides. These threats can be overcome by development of new crop varieties that are resilient to heat, insuring farmers against crop failures and intensive research work on stable agriculture in the context of climate change.

**Coastal zone management:** The potential climatic threats in this sector include increase in the number and severity of cyclones in the north coastal regions, especially near Kakinada and Visakhapatnam ports, loss of life and infrastructure due to cyclonic events, coastal erosion and severe marine pollution due to setting of thermal power plants, pharmaceutical companies and sand mining activities. These threats can be overcome by soil and water conservation in forest lands, restoration of mangroves, afforestation and eco-development through community involved programmes.

**Industrial maintenance:** The potential climatic threats in this sector include increasing fossil fuel consumption and carbon emissions from the industries, increasing storms to impede economic development in agricultural industry, depletion and degradation of surface water, aquifers and leaching from dumps causing acid mine drainage, destruction of habitat and loss of biodiversity. These threats can be overcome by enforcing cleaner water production processes and waste minimisation across industries. Improving drainage, alternate water supply sources can minimise environmental damage caused by industrial and sand mining activities.

#### **5.14 SGD 14 - Life below water**

The SDG 14 aims to conserve and sustainably use the oceans, seas and marine resources for sustainable development. Oceans and fisheries support the global population's economic, social and environmental needs. Oceans are the source of life of the planet and the global climate system regulator. They are the world's largest ecosystem, home to nearly a million known species. Oceans cover more than two-thirds of the earth's surface and contain 97% of the planet's water. They are essential for making the planet livable. Rainwater, drinking water and climate are all regulated by ocean temperatures and currents. Over 3 billion people depend on marine life for their livelihood. However, there has been a 26 percent increase in acidification since the industrial revolution [42]. Effective strategies to mitigate adverse effects of increased ocean acidification are needed to advance the sustainable use of oceans. The current efforts to protect oceans, marine environments and small-scale fishers are not meeting the need to protect the resources [44].

India has the highest population of fishing communities globally. These communities are spread over 3,600 fishing villages. More than 14.50 million people depend on fisheries for their livelihood [43]. The north coastal districts of Andhra Pradesh basically thrive on fisheries. Each of these districts has a well developed port and a fishing harbour. In order to ensure sustainable development of the sector, a number of measures have been taken by the Andhra Pradesh government, with an emphasis on livelihood creation as well as resource conservation. Some of the measures include modernization and upgradation of fishing centres as well as banning mechanised fishing in certain areas. India's Prime Minister Shri Narendra Modi has emphasised the need for a "Blue Revolution" wherein the plan envisages connecting 15 million beneficiaries for livelihood opportunities through various interventions [45]. Furthermore, the government has emphasised maintenance of the ecological integrity of the marine environment, in order to ensure that there are no adverse effects on endangered marine species. Various national and sub-national legislations are in place for the management and protection of the coastal and marine environment.

In specific relation to the north coastal districts of Andhra Pradesh, plastic waste and sewage management are two important criterions. The plastic waste like bottles and entangled nets sink to the bottom and sea creatures accidentally try to eat them. Thus the plastic waste is rendered harmful to aquatic life. The people and fishermen should be made aware to not discard plastic in the oceans and rivers. The sewage waste, especially in the Visakhapatnam coastal belt, when released into the oceans causes immense pollution in sea and harms the life therein. It is critical to install sewage treatment plants. One of the key drivers of global overfishing is illegal fishing. It threatens marine ecosystems and puts food security and regional stability at risk, and is linked to major human rights violations and even organised crime. Hence there is a need to regulate and monitor the fishing activities using marine police departments.

### **5.15 SGD 15 - Life on land**

The SDG 15 aims to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Humans depend on earth and the oceans to live. This goal aims at securing sustainable livelihoods that will be enjoyed for generations to come. The human diet is composed of 80% of plant life, which makes agriculture a prime economic resource. Forests cover 30 percent of the Earth's surface, provide vital habitats for millions of species, and important sources for clean air and water, as well as being crucial for combating climate change [46].

The threats to vegetation, in specific to the north coastal districts of Andhra Pradesh include receding coastlines, illegal and over sand mining, carbon emissions in industries, public discarding of plastic. These can be overcome by strict government monitoring and regulation and public awareness.

### **5.16 SGD 16 - Peace, Justice and Strong Institutions**

The SDG 16 aims to promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels. The north coastal districts of Andhra Pradesh have long been known to be the most peaceful region of the country. The key reason for this is the socio-economic blend of people and the religious and cultural harmony they enjoy. The peace can be sustained by friendly policing and controlling crime by strict patrolling. A strong institution of decentralised governance where people benefit directly from governmental welfare and development schemes is the need of the hour. This helps bypass illegal benefits the middlemen enjoy.

### **5.17 SDG 17- Partnership for goals**

The SDG 17 envisions to strengthen the means of implementation and revitalise the global partnership for sustainable development. Successful action on SDGs at the national or sub-national level calls for an “orchestrator” - a key actor within the government who can take the lead in adoption of SDGs, strategizing to achieve time-bound goals, and periodic monitoring for reporting and course-correction. For Andhra Pradesh, the Planning Department assumes this responsibility. The organic link with the framework, identification of concern areas and design of strategies, and real-time progress reporting are undertaken by the Planning Department. The periodic data for SDG reporting is obtained from all relevant line departments through the State Indicator Monitoring Framework (SIF) managed by the Planning Department. The Planning Department also acts as a coordinating entity within the state government by engaging with other line departments on the issues pertaining to SDG goal and target setting while also coordinating with the NITI Aayog [47].

The state government should work in collaboration with the union government to release special purpose grants to secure universal primary education, health, employment, affordable housing, and urbanisation provide a solid collaborative basis for securing the SDGs. In addition, the Centre should also supplement states finances by providing them with appropriate fiscal space.

It is also critical that the Public-Private Partnership (PPP) programmes be driven locally within the coastal districts to ensure business enterprises provide substantial financing to agendas that echo the SDGs [48]. This can be achieved by giving tax benefits to such private players. At the international front, the north coastal regions of Andhra Pradesh have a subsidised installation of the drip irrigation system that conserves water resources.

## 6. The summary

The summary of the proposed applicability of the UN SDGs to the localised implementation in rural north coastal districts of Andhra Pradesh for their economic progress and sustainability are listed in Table 2. This table summarises the SDG proposed at the global scale, the local threats/opportunities in the regions of rural north coastal Andhra Pradesh, and the proposed opportunities/ suggestive measures to overcome the threats.

SDG - Global goal	Local Threats	Opportunities /Suggestions
SDG 1 - No poverty	<ol style="list-style-type: none"> <li>1. Farmer deaths due to poverty</li> <li>2. Falling per capita income</li> <li>3. Wide economic disparities</li> </ol>	<ol style="list-style-type: none"> <li>1. Minimum support price for farmers.</li> <li>2. Extensive welfare schemes.</li> <li>3. Enhance fish production.</li> </ol>
SDG 2 - No hunger	<ol style="list-style-type: none"> <li>1. Very low decrease in hunger index.</li> </ol>	<ol style="list-style-type: none"> <li>1. Subsidised food canteens.</li> <li>2. Full meal provision to school going children.</li> </ol>
SDG 3 - Health & Well being	<ol style="list-style-type: none"> <li>1. Child deaths.</li> <li>2. Road accidents.</li> <li>3. Unhealthy food.</li> <li>4. Nuclear families.</li> </ol>	<ol style="list-style-type: none"> <li>1. Maternal health care.</li> <li>2. Safe road system.</li> <li>3. Sustainable farming practices.</li> <li>4. Joint families.</li> </ol>
SDG 4 - Quality Education	<ol style="list-style-type: none"> <li>1. High illiteracy rates.</li> </ol>	<ol style="list-style-type: none"> <li>1. Modernisation of government schools and regulation of fees.</li> <li>2. Full meal provision for school going children.</li> <li>3. Full fees reimbursement to poor merit students.</li> </ol>
SDG 5 - Gender equality	<ol style="list-style-type: none"> <li>1. Women still remain the less paid workforce despite being equal or more productive than men.</li> </ol>	<ol style="list-style-type: none"> <li>1. Provide equal employment opportunities to women.</li> <li>2. Encourage women participation in politics.</li> </ol>
SDG 6 - Clean water & sanitation	<ol style="list-style-type: none"> <li>1. Open defecation is still prevalent.</li> <li>2. Clean drinking water is not available to everyone.</li> </ol>	<ol style="list-style-type: none"> <li>1. Build inhouse toilets.</li> <li>2. Install water treatment plants in villages.</li> </ol>

SDG 7 - Affordable and clean energy	1. Daily power cuts to rural population.	1. "Power for all" initiative of the Union Govt. Of India in collaboration with Govt. of Andhra Pradesh to provide 24 hour power supply to all households.
SDG 8 - Decent work & economic growth	1. Many people still remain unemployed.	1. Create more farming employment opportunities in Srikakulam and East Godavari districts. 2. Provide more industrial employment opportunities.
SDG 9 - Industry, Innovation & Infrastructure	1. Heavy traffic. 2. Frequent flooding.	1. Construction of flyovers. 2. Construction of storm resilient high rise structures along the coastline.
SDG 10 - Reduced inequality	1. Social inequality. 2. Economic inequality.	1. Enhancing working rates. 2. Increasing wage rates. 3. Reducing gender discrimination. 4. Eradicating exploitation by contractor
SDG 11 - Sustainable cities and communities	1. Increase in the number of slums. 2. Lack of local health promoting facilities.	1. Adequate and affordable housing facilities provision. 2. Health facilities like gym, park, etc. at every locality.
SDG 12 - Responsible consumption & production	1. Water wastage. 2. Diesel consumption. 3. Plastic disposal. 4. Packaged foods.	1. Incentives to electric vehicles. 2. Public awareness of reducing plastic usage. 3. Incentives to organic foods.
SDG 13 - Climate action	1. Decrease in winter rainfall. 2. Excessive use of fertilisers and pesticides. 3. Increase in the number of cyclones. 4. Marine pollution from industries. 5. Carbon emissions. 6. Depletion of surface water.	1. Development of new crop varieties. 2. Intensive research on sustainable farming practices. 3. Afforestation and eco-development through community programmes. 4. Waste minimisation, improved drainage system, electric vehicles, etc.

SDG 14 - Life under water	<ol style="list-style-type: none"> <li>1. Discarding plastic in rivers and oceans.</li> <li>2. Letting untreated sewage into oceans.</li> <li>3. Illegal fishing.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce use of plastic.</li> <li>2. Proper sewage treatment.</li> <li>3. Regular vigilance of fishing practices using marine policing.</li> </ol>
SDG 15 - Life on land	<ol style="list-style-type: none"> <li>1. receding coastlines.</li> <li>2. Illegal sand mining.</li> <li>3. Carbon emissions.</li> <li>4. Public discarding of plastic</li> </ol>	<ol style="list-style-type: none"> <li>1. Increased awareness in people and rigorous vigilance.</li> </ol>
SDG 16 - Peace, Justice & Strong Institutions	<ol style="list-style-type: none"> <li>1. Corruptive practices of middlemen in implementing government welfare schemes.</li> </ol>	<ol style="list-style-type: none"> <li>1. Decentralised government vigilance and monitoring to give direct benefit to all eligible people.</li> </ol>
SDG 17- Partnership for goals	<ol style="list-style-type: none"> <li>1. A long term plan for capital generation to achieve the SDGs.</li> </ol>	<ol style="list-style-type: none"> <li>1. Niti Ayog initiatives in collaboration with the federal states.</li> <li>2. Public private partnerships. Adoption of foreign technologies like the drip irrigation system, etc.</li> </ol>

**Table 2. The summary of the proposed applicability of the UN SDGs to rural north coastal Andhra Pradesh.**

## 7. Conclusion

This article presented a descriptive analysis of the UN 2030 SDGs for sustainable development of all people around the globe, and its applicability to the rural north coastal districts of Andhra Pradesh. This article at its heart echoes the phrase “think globally, but act locally” and hence identified potential threats that undermine the adopted 17 SDGs and proposed measures/opportunities to overcome the same. The successful and rigorous implementation of these proposed measures, each executed to suit the local conditions, will let arise a new world filled with global happiness and peace and sustained economic progress.

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