Introduction to the Green Belt of Auroville: A Detailed Description on How its Actual Practices Contribute to the UN SDGs

Boglárka Nagy[1] and Zita Szabó[1]

[1]*PhD student, Szent István University*

Abstract

The South-Indian city of Auroville was founded in 1968 with the ambitious plan to become an utopist city for 50,000 habitants. The once heavily eroded land was transformed to a lush green area thanks to the past decades of landscape restoration work. The city aims to create a new type of human habitat where the residents live in harmony and close relation with nature. As part of its master plan a 2.5 km wide Green Belt is envisioned around the city zone that would contain organic farms and restored forest that provides timber and refilled underground water resources. The Green Belt is not only home to various projects of education and nature conservation but also an ecological system that already proved to locally reduce the severe effects of climate change.

The original master plan was designed by Roger Anger a French architect. While most of the development within Auroville is based on this original plan visiting researchers and experts warn that present social and spatial reality shows a very different scene. The nationally and internationally praised city faces serious threats. The growing real estate business, hotel developments, encroachment of lands and a planned highway in the Green Belt of Auroville are endangering the restored ecosystem.

Presently there are less than 3,000 Aurovilians, people of 50 countries, who are committed to live in Auroville and work for "the city the earth needs". In the same time due to the above mentioned dynamics already more than 25,000 people live within the planned area of Auroville, (over)using its ecological services.

The paper will describe the past and present development of Auroville with focus on the Green Belt. Based on the writers' personal experience and knowledge, collected during her years of living and working in Auroville, it will also attempt to describe the future scenarios. The role and significance of the Green Belt will be addressed through assessing its performance on the UN Sustainable Development Goals.

Keywords: Sustainable Development Goals, Landscape rehabilitation, Reforestation, Rain water catchment, Climate change

Introduction

The experimental city of Auroville was funded on 28th of February in 1968 on the Coromandel Coast of South India with the aim of creating a new model of life where humanity and nature can coexist in harmony. Over the past 50 years the heavily eroded area has undergone exemplary landscape rejuvenation and a small city has been formed with 3,000 residents from 54 countries of the world. The UNESCO,

national governments, international organizations and universities support and observe the development of this experiment.

Today the Greenbelt around the galaxy shaped city of Auroville is mostly perceived as the zone of the landscape rehabilitation and natural conservation work. The integrity of this zone is threatened by construction developments.

Background and Literature Review

City concept of Auroville

The city concept is based on Sri Aurobindo's work and philosophy, and the city plan was developed by Mira Alfassa a spiritual leader and Roger Anger a French architect, during years of collaboration and research. Their aim was to develop a city that considers all human needs, and offers a safe and healthy environment for 50,000 habitants. Available data shows that in past decades the number of habitants has been increasing in an accelerating movement (ARS 2018), so the original idea to reach 50,000 habitants does not seem so unrealistic after all.

The master plan of Auroville divides the city into 6 regions, that includes a galaxy shaped township and a 1.5 km wide outer green belt around it (Figure 1.).

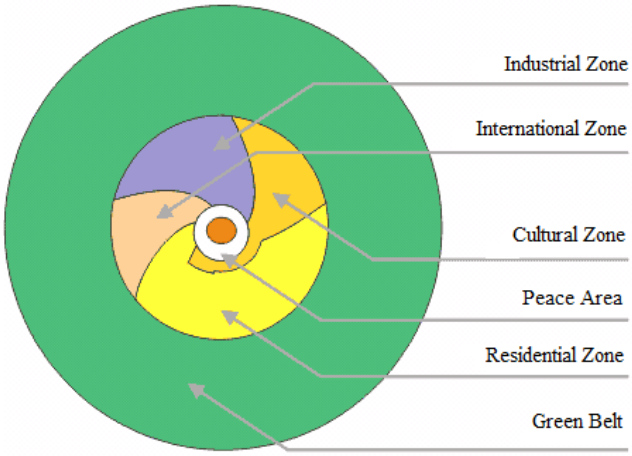

Figure 1. The Zones of Auroville as named in the Master Plan of Auroville, Copyright: Tensi

Figure 2. The Galaxy Plan Copyright: Auroville Archives (AA*)*

The central is the Peace Area, from where the roads and zones of the galaxy shaped township originates (Figure 2.). The urban area is divided into four zones. The 189 acres Residential Zone with parks and various height buildings offer space for individual and community life. The area can be built up to 45% and is designed for at least 55% green space (Thomas 2013). The Cultural Zone is the centre of education and artistic expression. Here are the schools, concert halls, theaters and sports facilities. The 109 acre Industrial Zone focuses on Auroville's self-sustainability and environmentally friendly development through green industries. The 74-acre International Zone is home to national and cultural pavilions and events by continent grouping (Fassbender 2018).

The outer Greenbelt is designed as Auroville's lungs, which surround the inner areas and protect them as a buffer zone and create a unique microclimate. This zone is an area of organic farms and forests that create a living space for wildlife and provide food, herbs and timber for the inhabitants of Auroville. Most of the rainwater catchment ponds are also located here. This paper focuses on the Greenbelt of Auroville and in comparison, with other greenbelts of the world it attempts to enhance the value of greenbelts reflected in the United Nations (UN) Sustainable Development Goals (SDG).

Greenbelt policy and the development and protection of greenbelts

A green belt or greenbelt is a land use town planning policy. The greenbelts are designed around cities to control the growth of the city core while preserving the rural landscape. Development on greenbelt land is supposed to be tightly controlled so that it can fulfill its main purpose: to serve as a buffer between towns, and between town and countryside (Sallay 2011).

While greenbelts were already mentioned in the Old Testament surrounding the Levite towns, as an urban planning policy it became popular from the nineteenth century. It is present in Australia, Brazil, Canada, Dominican Republic, Korea, Japan, Iran, Russia, United States and several countries of the European Union.

The most famous greenbelts are in England, where 14 greenbelts cover more than a tenth (12.4%) of the land of the country and provide a breath of fresh air for 30 million people (Campaign to protect Rural England 2019).

The protection of the greenbelts requires effort and perseverance in every country. Changing social, economic and political needs demand new constructions in the green areas near cities. Such lobby threatens the integrity of greenbelts even in England where national regulations protect them (Munton 2007).

Gaining land ownership was the initial attitude for protecting the greenbelts in London, Vienna and Ottawa. However in the absence of adequate financial resources other ways were required. Therefore, it became customary in international practice to protect the greenbelt areas through national or local regulations that strictly constrains construction developments (Sallay 2011).

Threats and possible protection of the Auroville Greenbelt (AVGB)

The AVGB is planned for 1200 hectares, but so far only 400 hectare is owned by Auroville. Further extension and proper management of new areas can ensure soil, water and biodiversity conservation (Nagy 2018).Since the early 2000’s, Auroville planners have been seeking ways to protect the land from unwanted developments. The Ministry of Human Resource Development of India, Auroville’s nodal ministry, approved the Master Plan of Auroville in 2001 and has published it in the Gazette of India. But this approval only offers a genuine protection once the State of Tamil Nadu, in which Auroville is located for the most part, transcribes it into State regulations, because in India, all matters related to land are the prerogative of the states, not of the Central Government (Bertrand 2018).

As AVGB is not protected by local regulations, acquired land ownership is the current practice to secure the land. Purchasing the missing land requires funds far beyond Auroville’s current means. The real estate pressure has pushed up the prices to levels that often match those of western industrialized nations, bringing the total amount required for the extension of AVGB to an estimated 250 million USD.

The AVGB area has become increasingly attractive to developers of private housing projects and hotels (Agrawal 2018). India foresees a population expansion of 300 million by 2050, and the real estate pressure on Auroville will increase accordingly. To date there are more than 60 private and unsolicited construction projects within the Auroville area, while the villages within the Master Plan area are expanding at extreme speed (Bertrand 2018). Collaboration with the six local villages that have territories within the AVGB might be essential in the future. As Cristo, an old time Aurovilien explained in his interview: "Therefore, there are two choices in front of Auroville. One is ignoring the village needs for expansion altogether and let happen what will happen. The second choice consists in being proactive and harmonizing village infrastructure developments by integrating them into Auroville's own Master Plan (Alan 2018).

A recent threat on the AVGB is the planned new highway that was announced in November, 2018 by the National Highways Authority of India. Their plan is to build a National Highway through the AVGB for a length of 3.5 kilometers. The new highway will serve as an artery for an ambitious program of industrialization and will become a busy freight corridor (Carel 2018).

Goals and Objectives

On 25 September 2015, the UN General Assembly adopted the 2030 Development Agenda. This agenda has 17 Sustainable Development Goals (SDG) and the associated 169 targets. The SDG plan focuses on key areas including poverty alleviation, democratic governance and peace building, climate change and disaster risk, and economic inequality.

The history on the origin of the London Greenbelt says that in 1580 Elizabeth I of England banned new building developments in a 3 mile wide greenbelt around the City of London in an attempt to stop the spread of plague (Sallay 2011). This act protected the health of the city's inhabitants, and centuries ago contributed to the 3rd SDG that aims to: "Ensure healthy lives and promote well-being for all at all ages". The above example attempts to point out that greenbelt practices and policies have been contributing to universal goals of humanity, even before such goals were adopted by the UN General Assembly as Sustainable Development Goals. The paper aims to describe the applied AVGB practices that contribute to the Sustainable Development Goals. Bringing attention to the importance of local and international greenbelt practices through the lenses of SDGs might contribute to gain adequate funds, awareness and regulation policies to protect the greenbelts.

Research Methods

The research was made in Auroville, where the researcher has been living and made her personal observations between 2005 and 2018. The literature review was based on the relevant literatures as listed in the references. An analytical study was made on the Global Indicator Framework for the Sustainable Development Goals and Targets of the 2030 Agenda for Sustainable Development UN document. Due to the wording limitations of this paper six goals were chosen, the ones that are the most relevant to the conference topic. The performances on the 2nd, 4th, 6th, 7th, 13th and 15th Sustainable Development Goals were then described with the AVGB practices.

Results

The following section contains brief description on how the actual practices of the Auroville Greenbelt contribute to the selected SDGs.

GOAL 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture

Figures 3 and 4. Organic tomato varieties at the Auroville Botanical Garden *Copyright: Auroville Outreach Media (AOM).* Buddha Garden vegetable bed Mulching and drip irrigation is combined in the vegetable garden. Copyright: AOM

Various alternative agricultural methods and proper water management of the AVGB allow producing food even in the most challenging weather conditions. Laying hens, dairy cows and work bullocks are kept and the cultivation of various plants occurs on AVGB's 22 farms. Each farm is organic and utilizes only environmentally friendly products for pest and disease control such as Neem tree extracts or EM. There are ongoing studies and experiments in the field of food production, including different types of permaculture and aquaponics systems.

Aurovilians have collected and preserved the seeds of local cereals such as samai, kombhu, varagu and ragi and have consistently saved the seeds in private and community seed-banks. These crops grow well during dry seasons and drought, and have excellent nutritional content. Garden vegetables have also been introduced since the 1990s. By collecting and replanting the seeds of imported vegetables and fruits, tasty and abundant new varieties have been developed that are adapted to the local conditions (Figure 3). A combination of different irrigation methods is used in Auroville. Rice is grown with flood irrigation during and after the monsoon season, while drought-resistant crops are planted for the dry season. Mulch-covered drip irrigation systems preserve the soil moisture in the vegetable gardens and orchards (Figure 4)

Figure 5. Spirulina Farm in Auroville Copyright: Aurospirul

In the concept of vertical horticulture, the heat-sensitive vegetable gardens are located in the shade of trees. This method lengthens the production period of certain vegetables and fruits. Experiments are underway in several AVGB forests to plant and propagate tree varieties that are suitable for food and biofuel production. Ayurvedic medicinal herbs are successfully grown in the forests and are used as nutritional supplements and medicines. Herbs are also used for the production of soaps, detergents, and environmentally friendly sprays for agricultural pest and disease control.

Food Link the distributor of the Auroville farm products limits food price volatility, by using yearly fix rates for the products. Currently an estimated 15% of Auroville's food is produced by its AVGB farms (AVFG 2015). The number of spirulina farms in AVGB is gradually increasing (Figure 5.). Spirulina is a fresh water algae containing high concentration of micronutrients and is labeled as a superfood due to its extremely high nutritional value. Spirulina farms require relatively little water.

GOAL 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all

Figure 7. Utilization of Wind Energy The AV55 windmill at work in the Auroville greenbelt Copyright: AOM

Figure 6. Rainwater catchment Rainwater catchment ponds are created in a systemic way, and follow the surface level. Copyright: Kireet

In the past decades numerous green educational centers developed in the once barren land of the AVGB. One is The Botanical Garden that collaborates with 120 state school and yearly 3,000 children participates in its educational activities (Emma 2018).

GOAL 6: Ensure availability and sustainable management of water and sanitation for all

Auroville lies on a slightly sloping plateau, and sudden rainfall tends to rush towards the sea. The goal of water management is to achieve zero rainwater runoff and to refill the underground water resources, thus creating water reserves and preventing flooding or erosion. The needed rainwater catchment system of ponds, dams, bunds and canyons are situated in the greenbelt. The system collects the water in permeable water bodies, from which it slowly leaks into the soil and recharges groundwater resources (Figure 6.). The dams in the canyons are staged, and the boulders and rainwater catchment ponds follow the natural contours and levels of the landscape. This system captures precipitation, gradually refilling groundwater resources and avoiding floods (Kireet 2017). Auroville has more than 60 types of sewage treatment systems in operation. There are efforts today to make a centralized waste water treatment plant in the greenbelt, from where the cleaned waste water would be used for the irrigation of Auroville landscapes.

GOAL 7: Ensure access to affordable, reliable, sustainable and modern energy for all

In the AVGB energy policy allows only the use of renewable energy. Therefore this area always focused on the inventions and developments of technologies that use renewable energies (Figure 7.). The Auroville

Electrical Service explained in a discussion, that currently Auroville produces four times of its consumed electricity, and the surplus is shared with neighboring villages through the Tami Nadu Electricity Board system.

GOAL 13: Take urgent action to combat climate change and its impacts

According to various climate impact studies, the area of Auroville is expected to become drier and hotter which most likely results more droughts to occur. The rainfall will become unpredictable. The total amount of rainfall will increase but the length of rainy days will shorten. The intense rainfalls will increase the risk of landslides, sudden floods and other natural disasters (Potsdam Institute 2013).

Recent weather events suggest that the landscape rehabilitation methods that were used and developed in Auroville offer certain protection from the impacts of climate change through a complex, holistic system. In this system, the transformed AVGB landscape best suit the environmental conditions. The stressed water situation, which occasionally creates abundance and sometimes scarcity, is remedied by the rainwater catchment system. With the help of the green plant coverage such as forest, a hot environment is converted into a pleasant microclimate. Certain agricultural methods can allow food production to continue under extreme weather conditions (Nagy 2018). Methods used in Auroville to counteract the effects of climate change are mainly local, but have the potential to indirectly result in global effects.

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

The success of reforestation in past decades has contributed substantially to the development of a pleasant microclimate and the refilling of groundwater aquifers. It has been estimated that there are approximately 5 million trees in Auroville today. In the beginning, fast-growing trees were planted that were mostly Acacia varieties imported from Australia. Later, the focus moved to indigenous trees, and plant propagating materials were collected from temple gardens and sacred groves where strict religious restrictions have preserved the trees for centuries. Nurseries and botanical gardens were set up, and soon millions of trees, bushes and creepers have been planted. With the return and proliferation of the indigenous animal species, the forest became self-sustaining because the seeds are dispersed by the animals. Auroville's reforestation work accounts for 4% of the total area of Tropical Dry Evergreen Forest (TDEF) in India (Land and Nature 2017).

Discussion and Conclusions

On 25 September 2015, the UN General Assembly adopted the 2030 Development Agenda. This agenda has 17 Sustainable Development Goals focusing on key areas including poverty alleviation, democratic governance and peace building, climate change and disaster risk, and economic inequality. The greenbelts, that balance the natural and human habitats, have been contributing to such universal goals long before these were adopted by the UN.

Most greenbelts are customary protected by governmental regulations; unfortunately currently no such regulations support the Auroville conservation work. Due to the increased land prices ownership of the planned 800 hectares expansion is difficult to obtain. The present threat of a planned highway through the AVGB expansion area draws attention to the importance of Auroville's collaboration with the local villages and Tamil Nadu Government.

In the past 50 years the barren plateau of Auroville has gone through exemplary landscape rehabilitation (Figure 8, 9.). While international and national discourse praises Auroville for its decades of conservation work, no description was available until now about its performance on SDGs. Viewing greenbelts as contributors to the UN SDGs might open new discussions to obtain needed regulations and funds for the protection and development of greenbelts.

Figures 8 and 9. The change of the Auroville Landscape,
The once heavily eroded land became a luscious forest with the Peace Area in its centre.
Copyrights: Dominique Darr, AOM

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