



# GROWTH MANAGEMENT FRAMEWORK

for Settlements in the Auroville Green Belt



# Growth Management Framework for Settlements in the Auroville Green Belt

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**Lalit Kishor Bhati**



**Auroville**



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Finally, we thank family, friends, and significant others whose love and encouragement, from start to finish, helped us make this journey an enormous success.



# meet the PROJECT TEAM



Front Row (left to right): Miles Weekes, Ajay Agarwal, Peter Huan, Meghan Robidoux, Joanna Rees

Back Row (left to right): Anna Geladi, Laurel Sharp, Jonella Evangelista, Jennifer Smyth, Sarah Ezzio, Alex Gordon, Michael Hanifi, Phillip Prell

This report was prepared by postgraduate students at Queen's University's School of Urban and Regional Planning in Kingston, Ontario, Canada. The international project team was comprised of 12 students in their second year of the Master of Urban and Regional Planning (M.Pl.) program,

The students come from diverse undergraduate programs, including journalism, criminal justice, music, geography, environmental sciences, visual arts, sociology, political science and education. Each team member is interested in varying areas of concentration in the field of urban planning. Both individually and collectively, the team is equipped with versatile skills that have contributed to the successful completion of this project.

# Executive Summary

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## Project Summary

Auroville's Perspective Master Plan (2001) includes a Green Belt zone that is intended to be used as a tool to assist in managing development and future growth around Auroville. Within Auroville's Green Belt, there are six village settlements, all of which are experiencing growth. This is ultimately putting pressure on the Green Belt. While growth can offer economic development opportunities, these pressures can also cause environmental degradation and a loss of cultural heritage. The purpose of this document is to provide a Growth Management Framework for Settlements in the Auroville Green Belt to identify ways in which Auroville and the villages can grow together harmoniously.

## Background

Greenbelt plans are widely used to manage growth pressures in urban settings while preserving environmentally sensitive areas. Auroville's Green Belt was initially created as a way to protect and promote the sustainability goals of the community. New developments in the nearby villages and throughout the Green Belt prompted the need to study the effects of growth and to develop a comprehensive strategy. Further, the research is timely due to the ongoing review of Auroville's Green Belt Development Plan (2011). The research conducted for this project is intended to inform changes to the Green Belt Development Plan and provide direction for future research.

## Process

The research process began in September 2017 in Kingston, Ontario, Canada with 12 Master of Urban and Regional Planning students from Queen's University conducting background research and interviews. The project team worked for three months in Canada to establish a baseline of knowledge on greenbelts, growth management tools and to establish an understanding of the Auroville context. Two weeks in Auroville at the beginning of December provided the project team time to further research the growth pressures experienced in Auroville's Green Belt and gain a better understanding of the relationships between

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stakeholders. The research that was conducted is intended to provide background so that recommendations for future action can be offered.

Different research methods were used to develop the Growth Management Framework outlined in this document. The first research method that was utilized was a policy and document review, which had two goals: 1) to research the social, cultural and political context of planning in Auroville; and 2) to research best practises in growth management tools and strategies. Next, six international greenbelt case studies were analyzed to understand greenbelts as a growth management tool in a variety of geographical, political and social contexts. The final research method used was a combination of interviews and focus groups. The majority of these were conducted in Auroville, however, a select few were conducted via Skype or telephone from Canada. These interviews provided insight into the views of various stakeholders on greenbelt growth management. The research collected allowed the project team to develop a variety of solutions to assist in future management within the Auroville Green Belt.

## Findings

A number of noteworthy findings came out of the research conducted. The most common finding revealed was a need for better communication between all stakeholders. More specifically, communication channels between Auroville, panchayats, state governments, landowners and villagers could be strengthened. A number of other issues arose relating to growth management solutions that fall under four key themes: land use, market-based, environmental, and social.

From a land use perspective, there is incomplete data and information regarding development and infrastructure in the Green Belt. The need for data on infrastructure was a common concern from many stakeholders in the region. In the past, Auroville has undertaken various mapping and surveying initiatives, however, many are incomplete, inaccessible or unreliable.

Auroville owns lands within and around the Green Belt and is currently using a variety of soft approaches to further the objectives of the Green Belt. Research found that market-based initiatives can be effective for growth management and would support existing efforts. Furthermore, interviews highlighted a need to increase the utility of currently owned lands.

Environmental conservation is a priority for Auroville. Managing growth is important for the region to protect environmental systems such as watersheds, agricultural land and biodiversity. Moreover, local groups are aware of the need for better environmental land uses. However, there is a lack of guidance in this matter.

Many stakeholders highlighted the need for a bottom-up approach to developing a Growth Management Strategy for the Green Belt. Balancing growth management strategies while encouraging economic development was a common issue that was discussed. Auroville is currently working to build relationships with the Green Belt residents through social outreach programs.

## Recommendations for Further Action

The research conducted by the project team is broad in scope and provides a framework for future research and study. An extensive checklist of recommendations and possible solutions is attached in Appendix B. These recommendations are categorized thematically and include: land use, market-based, environmental, and social.

The following report provides an in-depth analysis of greenbelt growth management strategies and their application to Auroville's Green Belt. Through the research, a series of solutions were developed to create a framework for the next 5-7 years. The end goal of this Growth Management Framework is to create a regional Growth Management Strategy for Auroville and the surrounding region.

### Land Use Recommendations:

- Mapping
- Population Projections
- Infrastructure Assessment

### Market-based Recommendations:

- Land Exchange
- Land Lease
- Development Rights
- Direct Purchase
- Planning and Design Guidelines

### Environmental Recommendations:

- Data Collection and Mapping
- Rural Development Programs for Auroville
- Partnerships with Villages

### Social Recommendations:

- A Collaboration Hub
- Activity Impact Assessment
- Community Asset Assessment





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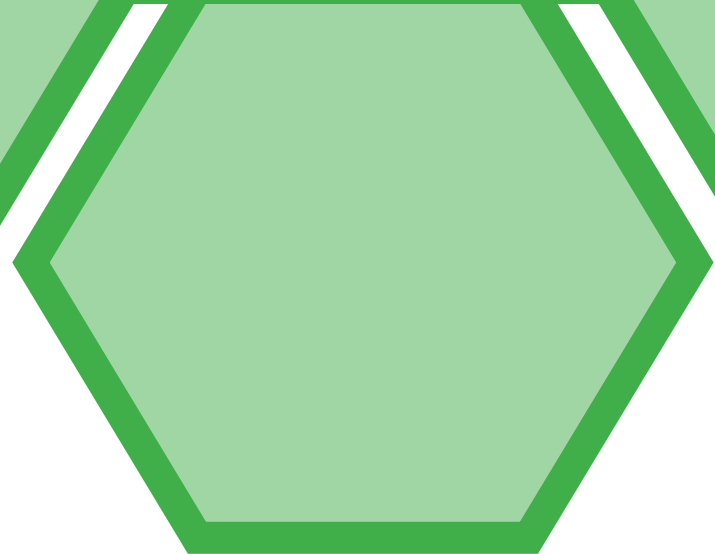
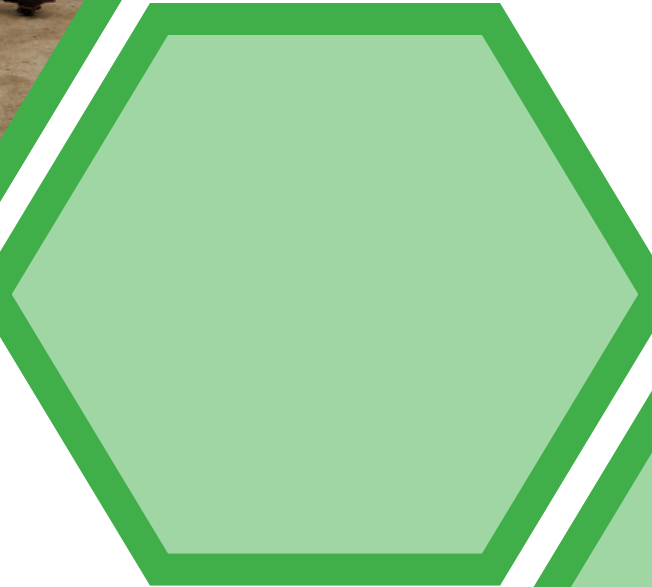
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# chapter 1

## INTRODUCTION

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# 1.1 Introduction

A greenbelt\* is a popular tool for urban growth management. Greenbelts restrict growth in developed urban areas while preserving the undeveloped and/or agricultural land surrounding urban centres. Successful greenbelt policy involves thorough implementation strategies, building consensus between various stakeholders, as well as political coordination over large geographic areas. The Town of Auroville in Tamil Nadu, India, is an example of a municipality that has implemented a greenbelt to ensure that a sustainable approach to land development is followed. As several small independent communities are located inside the Green Belt, Auroville's Green Belt presents the opportunity to develop a more cohesive Growth Management Strategy focused on best practices for guiding growth within these communities.



*Sunset at Auroville Matrimandir.*

\*Sometimes stylized as “green belt”, as is the case in Auroville where the term greenbelt is formally written as “Green Belt”.



# 1.2 Auroville Context

Auroville is a township located in Tamil Nadu, India, 15 kilometers from Pondicherry. Founded in 1968 by Mirra Alfassa, a French woman known as 'the Mother', Auroville was envisioned as an international community free of government, money, religion, and conflict. In 1996, the concept of Auroville was endorsed by the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the Government of India. UNESCO's support has been ongoing since Auroville's creation because it represents an experiment that has the potential to become a new way forward for the entire world (Statement of Support, 2016). Auroville is intended as a city for up to 50,000 inhabitants from around the world. Today, there are 2,766 residents from 54 countries living and working in Auroville (Census, 2017). Currently, Auroville is known as the first and only internationally endorsed ongoing experiment in human unity.



Figure 1: Concept drawing for Galaxy Plan (auroville.org).

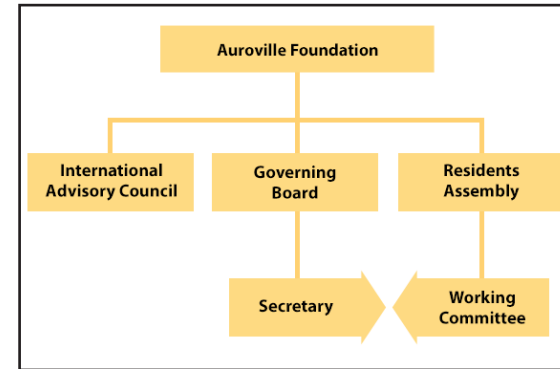


Figure 2: Auroville Governance Structure (auroville.org).

## Governance in Auroville

In 1988, the Central Government of India protected the future of Auroville after the Mother's passing through the *Auroville Foundation Act* (1988). This *Act* put the legal responsibility for the land into the hands of the Auroville Foundation (AVF), a legal entity charged with making decisions for the management and future development of Auroville lands (The Auroville Foundation, 2015). The *Act* created the governance system of Auroville, which includes the Residents Assembly, Governing Board and the International Advisory Council (Auroville, 2014) (Figure 2). The Governing Board is responsible for the ongoing development of Auroville and making sure it is keeping with its original aims, values, and ideals. It is composed of seven individuals who are nominated by the Central Government of India for their contributions to Auroville and maintaining its ideals (Governing Board, 2017). The International Advisory Council is responsible for advising the Governing Board on matters relating to management and development of the Township. It is composed of five individuals of high international reputation. The Residents Assembly consists of all residents of Auroville over the age of 18. Together these entities are responsible for evolving and implementing the Master Plan for Auroville's future development together with the Governing Board.

## Planning in Auroville

The *Auroville Foundation Act* (1988) required the AVF to create a Master Plan for the lands of Auroville to help direct the community's future (Auroville, 2014). The Perspective Master Plan was published and gazetted by the Central Indian Government in 2001 to direct growth through to 2025 (Auroville, 2001). It was based off of a concept sketch drawn by the Mother, which became the Galaxy Plan shown in Figure 1. It divided the community into four central sectors: residential, cultural, international, and institutional. These sectors are surrounded by a Green Belt to guide the community towards sustainable development (Auroville Perspective Master Plan, 2001). This Master Plan has annual reports for detailed implementation and five-year reviews of the plan to account for changes that have occurred in the community (Planning the City, 2014). The Town Development Council (TDC) manages the Master Plan (L'Avenir d'Auroville, 2014). This council deals with all matters concerning the Master Plan, including design, transportation, agriculture, and the integration of regional/village development as they relate to Auroville (L'Avenir d'Auroville, 2014). This group is responsible for ensuring that all future projects on AVF owned land conform to Auroville's zoning regulations including: land use, maximum buildable area on all floors, total floor area and minimum size of site required for development.

## Geographic Jurisdiction

The geographical location of Auroville creates an interesting challenge for planning. The governmental administration of India is hierarchically organized (from top down) into: the central government, state/union territories, districts, and taluks (Srinivasan, 2011). The state of Tamil Nadu and the Union Territory of Puducherry both have villages within the boundaries of Auroville's Green Belt, seen in Figure 3. Among the villages that fall within the Green Belt, Alankuppam is the only one that is under the jurisdiction of Puducherry and is surrounded by the state of Tamil Nadu.

These villages operate with their own planning and governance systems, posing a challenge for maintaining the Green Belt as planned.

Both Puducherry and Tamil Nadu operate on a hierarchical structure that divides regions into districts and further into taluks, which are the basic administration unit for an area. At the village level, governance administration is run by the panchayat, the elected council that deals with issues and approvals at a village level (Srinivasan, 2011). In the case of Puducherry, the Puducherry Planning Authority is in charge of urban planning. They create development plans and land use maps (Government of Puducherry, 2013).

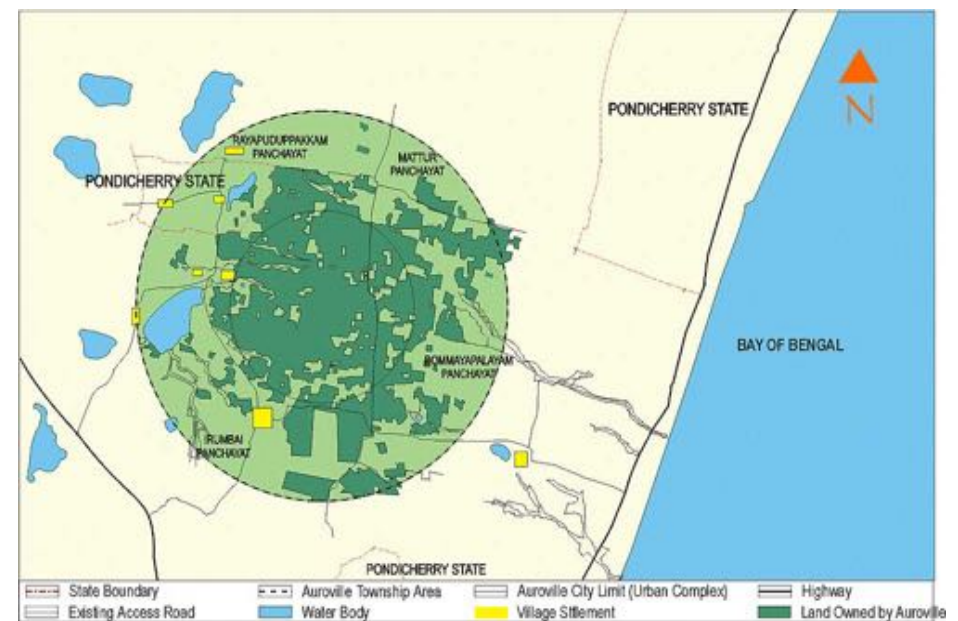


Figure 3: Map outlining the boundaries of Pondicherry State and the six village settlements within the Green Belt (Auroville, 2011).



## Village Relations in the Green Belt

The 2001 Perspective Master Plan provides an outline for the protection of land within the Green Belt (Auroville Perspective Master Plan, 2001). Since Auroville's Green Belt encompasses land outside the ownership of the AVF, strong village relationships between and within Auroville, Tamil Nadu, and Pondicherry are essential to protecting the Green Belt area while supporting the increasing needs of various village residents. The Green Belt Development Plan (2011) states that Auroville does not seek to control development within the villages, but strongly encourages these villages to adopt the principles of the Green Belt Plan, which directs development towards environmentally sustainable land management and the protection of water resources (Auroville, 2011).

Although the AVF has developed and maintained a very close relationship with the Government of India (The Auroville Foundation,

2015), the significance of planning for Auroville's Green Belt is dependent on relationships built at a local level with the panchayats of Irumbai, Edayanchavadi, Rayapettai, Sanjeevi Nagar, Kottakarai and Alankuppam. The Auroville Village Action Group has made continuous efforts to build connections among villagers and Aurovilians through the implementation of various programs that focus on educational training and employment opportunities for villagers, such as supporting small businesses (Auroville Village Action Group, 2017). Currently, these relationships have relied heavily on soft approaches that strive to build trust and foster urban-rural links (Auroville Village Action Group, 2017). However, solely relying on these approaches cannot guarantee a protected Green Belt, as developers aim to capitalize on the undeveloped land and offer villagers monetary value that may be hard to refuse.



*Project team members meet with representatives from the Auroville Village Action Group and community leaders from the village communities (December 5, 2017).*

# Auroville Green Belt

## Auroville's Green Belt

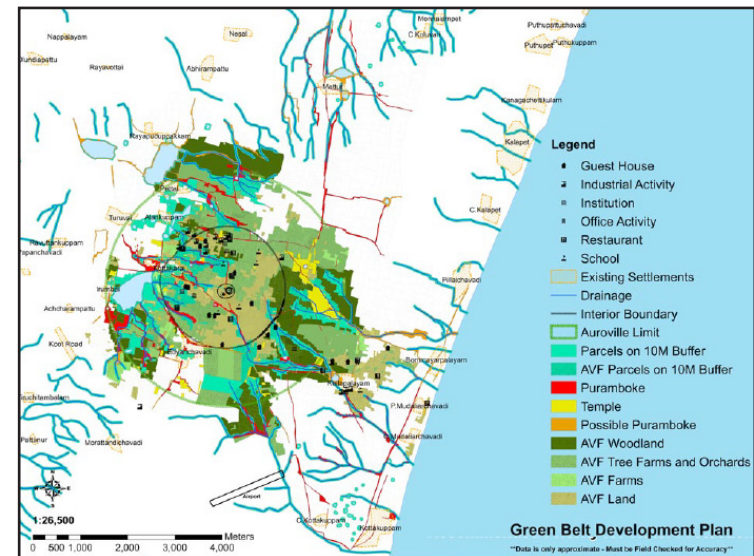
The 1.25km wide band around the urban centre of Auroville is an important bioregion for Aurovilians and surrounding communities (Auroville, 2011). When the first Aurovilians arrived, the landscape was barren and eroded (The Pioneer Days, n.d.). Their first tasks were to reforest the area, improve water irrigation, and develop the Green Belt as a barrier for Auroville's urban growth and external development pressures from Kalapet and Puducherry (Auroville Perspective Master Plan, 2001). The 2001 Perspective Master Plan officially designated this area as the Green Belt, with uses limited to farming and agriculture, recreation, and forestry and regeneration. The AVF owns approximately 25 per cent of the Auroville Green Belt area with the remaining 75 per cent in the hands of private, government and temple ownership (Auroville, 2011). While the Town Development Council controls the development of Auroville-owned land through the Master Plan, they do not have the authority to enforce these uses over privately owned land, or land within the villages.



*Idealized plan of the Green Belt (Auroville, 2011).*

## Auroville Green Belt Development Plan

The Green Belt Development Plan (2011) further clarifies the purpose and uses within the Green Belt and addresses solutions for privately owned land to protect the bioregion as a whole (Auroville, 2011) (Figure 4). Some of the clarification included adding land uses for the protection and management of water resources to the original three categories (agriculture, reforestation, and recreation) (Auroville, 2011). This framework also identifies land management categories with different strategies for the management of land proposed for the Green Belt based on ownership and the location of the land (Auroville, 2011). These techniques include identifying the lands outside of Auroville's jurisdiction for cooperative work with landowners to manage it in a way that is beneficial to the Green Belt vision. These techniques provide different ways to work with communities, states, and landowners to see the vision of the Green Belt protected for generations (Auroville, 2011).



*Figure 4: Auroville Green Belt Development Plan (Auroville, 2011).*

## Development

Pressure from new developments within Auroville's designated Green Belt jeopardizes the environmental integrity of the land. Currently, Auroville faces issues with securing the required lands for the plan envisioned by the Mother. The existing settlements within the villages illustrate that local residents have already established a livelihood within relative proximity to Auroville's centre and, therefore, should be accommodated within the plans of the Green Belt. The proposed Green Belt encompasses multiple state boundaries. Therefore, strategies to work with local and district authorities will be needed to create a comprehensive growth plan (Auroville, 2011). Yet at this point, interactions between planning authorities have been limited and current village relations are not strong enough to withstand the demands of developers.



*An example of a village home in the Green Belt.*

## Auronya College

The arrival of the Auronya College in Alankuppam presents an example of a strong growth pressure into the Green Belt. A new college campus will dictate new land uses, the construction of buildings, an influx of residents and commuters, and an overall strain on Green Belt designated land. With respect to the existing planning context, alternatives need to be looked at, where an approach beyond trust can be formalized to assure that further development within the Green Belt falls within the land uses of agriculture and farming, forestry and land regeneration, and recreation.





# 1.3 DEFINING THE PROBLEM

The challenges facing the Auroville bioregion involve multiple stakeholders, each with different and often conflicting interests. The main task facing the Project Team is to reconcile environmental protection priorities with economic development interests and any associated social costs. The Auroville Charter emphasizes the importance of living sustainably and working towards the goal of human unity. On the other hand, Green Belt residents prioritize the development of a sustained livelihood while maintaining cultural heritage. With these broad goals in mind, the problems to be addressed by the current report must be defined from both the Auroville and Green Belt residents' perspectives.

## The Auroville Perspective:

The Auroville community presents a unique perspective: balancing sustainable environmental efforts with spiritual progression and realizing human unity. Auroville has planned a Green Belt area around the city area in an attempt to curb unmitigated development and environmental exploitation. Protecting these Green Belt lands presents a significant challenge to Auroville. Most of the lands within the Green Belt are privately owned by villagers, temples and other landowners. Auroville needs to find a way to enforce Green Belt conservation efforts on privately owned lands. Further to this point, there are new developments occurring in the area that are not compatible with Auroville's goals and do not constitute sustainable developments. Auroville must work to develop stronger relationships with Green Belt residents to discourage unsustainable development while protecting valuable water sources and agricultural lands.



## The Green Belt Residents' Perspective:

Green Belt residents prioritize a different set of concerns than Aurovilians. Many local residents face a lack of economic security, aside from selling their property, providing tourism services and participating in the handicraft industry. Traditional agriculture is no longer considered to be a profitable endeavour, nor is there a significant interest in entering the profession. Meanwhile the pressure of marriage payments and meeting basic needs such as water, food, and children's education persist. As a way to meet these needs, Green Belt residents often sell their land to external developers. These developers build without regard to community character or cultural heritage, instead focusing on ways to maximize profits, which often disregards sustainability principles. This phenomenon detracts from the local surroundings and may impact future local endeavours.

Auroville currently has a comprehensive Green Belt Development Plan (2011), managed through the Perspective Master Plan (2001). However, more work is required to better account for the conflicting needs and interests of stakeholders in the Green Belt. To do so, approaches for growth management in the Green Belt should balance the socioeconomic needs and property rights of Green Belt residents with the sustainability and conservation initiatives that Auroville intends for the Green Belt.

# 1.4 PROJECT OBJECTIVES



This report provides a Growth Management Framework for the Settlements in the Auroville Green Belt. The Framework offers possible solutions to the current problems in the Auroville Green Belt from the Auroville and Green Belt residents' perspectives, as well as outlines required steps for implementation. Completing the steps included in the Growth Management Framework will allow Auroville to ultimately develop and implement an effective Growth Management Strategy for the Green Belt. Such a Growth Management Strategy is intended to eventually become part of Auroville's Green Belt Development Plan (2011), which is currently under revision. This report aims to provide solutions to achieve the following three objectives:

## Objectives:

1. To develop measures to preserve Green Belt lands for the intended uses outlined in the Perspective Master Plan.
2. To develop measures to control development within the Green Belt on non-Auroville owned lands.
3. To facilitate a collaborative and mutually beneficial planning relationship between Auroville, village, and state planning authorities.

The Growth Management Framework presented in this report is suited to Auroville's unique context, but the recommendations presented can inform growth management strategies and greenbelt plans worldwide. The report consists of several sections as follows: Introduction, Research, Possible Solutions, and Implementation.

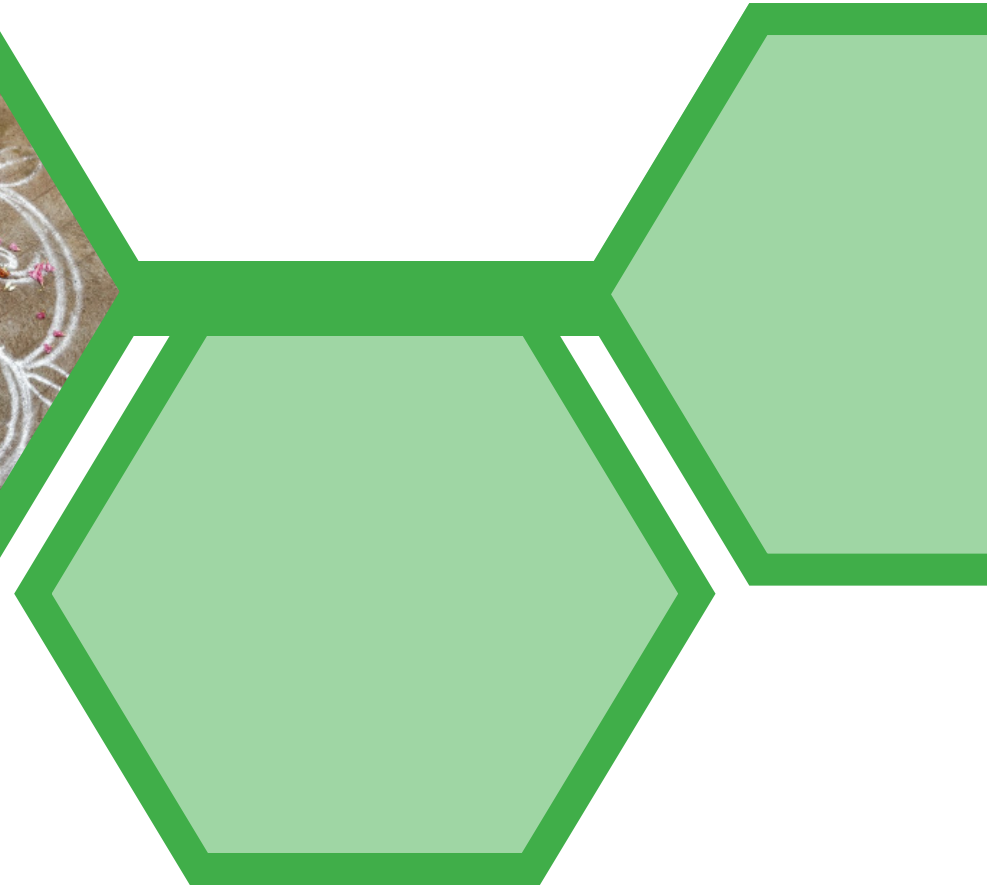
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# chapter 2

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## 2.1 Introduction

Chapter Two provides an overview of all background research completed, both prior to arrival in Auroville and while conducting fieldwork in Auroville. The report was informed by a number of different opinions and views on how to build a Growth Management Strategy that considers the interests of all stakeholders in the Auroville Green Belt. The content of this chapter includes the policy and document review, international greenbelt case studies, and results of interviews and focus groups. The policy and document review was used to develop an understanding of the social, cultural, and political context of planning in the Auroville region and to gain knowledge of best practices in growth management tools and strategies. International greenbelt case studies have been conducted to study long established greenbelts around the world and identify lessons for Auroville. Finally, interviews and focus groups provided knowledge of what local stakeholders would prefer to see in a Growth Management Framework for the Auroville Green Belt. This background research was used to inform the possible solutions presented later in Chapter Three.



*Focus with Queen's students and Auroville planners (December 6, 2017).*

## 2.2 Policy and Document Review

### Methodology

#### Objective

The aim of this method was to broaden the team's background knowledge on Auroville's planning policy and to better understand the project area. Additionally, it was used to gain comprehensive knowledge of growth management tools and greenbelts.

The first purpose of the policy and document review was to enhance the team's understanding of the planning and policy tools used in the Auroville region. Information on current and past projects undertaken in Auroville were reviewed, while also identifying potential stakeholders to contact for interviews and focus groups (Bowen, 2009). The results of the policy and document review on the Auroville context are included above in Chapter One.

The second purpose of the policy and document review was to examine a variety of growth management tools and strategies to understand the types of policies enacted and how they were implemented in different international contexts. This allowed the team to consider best practices that could be applied to growth management in Auroville's Green Belt.

The documents included in this review came from Auroville, Tamil Nadu, and Puducherry, as well as a number of international cities. These documents ranged from describing life in Auroville to more technical documents, such as the Auroville Charter, various greenbelt plans, and planning reports. The documents reviewed are listed adjacent.

#### Auroville Documents

- Auroville Charter, 1968
- Auroville Foundation Act, 1988
- Auroville Green Belt Development Plan, 2011
- Auroville Land Suitability and Land Use Proposal, 2014
- Auroville Mission Notes by A. Ravi, 2007
- Auroville Perspective Master Plan, 2001
- Pondicherry Village and Commune Panchayat Act, 1973
- Puducherry Citizen's Charter, 2012
- Puducherry Town and Country Planning Act, 1969
- Puducherry Town and Country Planning Rules, 1974
- Puducherry Bye-law Amendment, 2017
- Tamil Nadu Town and Country Planning Act, 1994
- Tamil Nadu Panchayats Act, 1994

# Growth Management Tools

A diverse range of policies and scholarly literature addressing growth management has been examined to identify various strategies and incentives to manage growth around urban areas. The tools identified in this document review have been divided into three categories: (1) environmental protection strategies, (2) financial incentives and strategies, and (3) non-monetary incentives and strategies.

## 1. Environmental Protection Strategies

An important component of any growth management program is environmental protection. In Ontario, Canada, conservation authorities are delegated the authority to regulate development and activities in watersheds by the *Ontario Conservation Authorities Act* (1990). Largely funded by municipalities, conservation authorities are encouraged to develop watershed and sub-watershed management plans to inform their municipalities' official plan policies. In particular, conservation authorities provide local watershed expertise on issues such as flooding, erosion, pollution, and conservation of land (Conservation Ontario, n.d., and Conservation Ontario, 2012). However, most watershed management plans have no legal status, meaning there is no obligation for municipal compliance with their recommendations (Worte, 2016).

In contrast to watershed management plans, environmental impact assessments (EIAs) are another environmental protection tool that often do have legal standing. EIAs are commonly required in areas of protected land, such as watersheds, to demonstrate that a proposed development will result in no overall negative impacts to the natural functions and features of the land. Completing an EIA involves identifying the natural features and functions of the land and assessing the potential environmental impacts, requirements for impact avoidance and mitigation measures, and opportunities for enhancement (Halton Region, 2009a). When and where EIAs

## Growth Management

- Framework for creating a smart growth economic development strategy: a tool for small cities and towns, 2016
- Planning Implementation Tools Transfer of Development Rights, 2005
- Incentives for the Twenty-First Century, 2015
- Whatcom County Growth Management Tools, 2015

## Greenbelts

- Canada's Capital Greenbelt Master Plan, 2013
- Metro 2040 Framework Update, (Portland Area Greenbelt Plan) 1995
- Metro's Regional Framework Plan, Summary of 2040 Growth Concept, 2011
- Wellington Town Belt Management Plan, 2017
- Wellington's Outer Greenbelt Management Plan, 2004
- Greater Golden Horseshoe Greenbelt Plan, 2017
- Growth Plan for the Greater Golden Horseshoe, 2017



will be required is most often outlined in official plans or otherwise determined by local planning authorities.

Buffers are also commonly used as a tool for environmental protection in regional and local planning policy. A buffer is an area of land with a specified width that surrounds a significant environmental feature, usually bordering lands that are subject to development or site alteration. The extent of the buffer, and the activities permitted within it, should be based on the sensitivity and significance of the feature it surrounds. In addition, buffer boundaries should be outlined in municipal planning policy documents (Halton Region, 2009b).

Finally, as growth is highly dependent on the availability of resources, undertaking a water carrying-capacity analysis or imposing water well limitations can protect a sustainable level of drinking water supply. In regards to water quality, a water carrying-capacity analysis can be used to document safe thresholds for pollutants, determine point and non-point sources of pollutants, and recommend land use and storm water management alternatives to keep water quality at acceptable levels (Banta, 1991). For water quantity, limitations of water well drilling, house size, and number of fixtures can help to ensure sufficient water is available for present and future needs (Whatcom County, 2015).

## 2. Financial Incentives & Strategies

Offering financial incentives to landowners can be an effective way of controlling what land is used for and who has access. While municipal budgets can hinder the ability to utilize financial incentives, they can be powerful tools if they are economically feasible. Land purchases provide the greatest control over the use of property, as the municipality owns the land and can dictate how it is used in the future. Municipally owned land can then be leased back to farmers for continued food production or can be used for other purposes as municipalities see fit. Purchasing of development rights is another incentive to limit development that



can occur on a property. These usually take the form of conservation easements or covenants that are registered on the land title and bind all current and future landowners (Environmental Law Centre and Miistakis Institute, 2017). In most cases, a land trust will be set up to hold the easement or covenant (Stevenson, 2011). Land purchases and purchasing of development rights are just some ways that monetary incentives can be used to manage growth.

There are also financial strategies that governments use to discourage development. Impact fees are imposed on developers with the goal of helping cities to pay for the infrastructure that is required for new developments (Impact Fee, 2017). Additional fees will restrict development of land, and have the benefit of raising revenue for infrastructure improvements. Land value taxations, where municipalities tax land at different rates based on land value, can also restrain development in undesired areas (Whatcom County, 2015).

### 3. Non-monetary Incentives & Strategies

#### Land Leasing

Land leases or ground leases are a form of rental agreements that permit the tenant to occupy or use a portion of land owned by the landlord in exchange for a rent sum. The lessor undertakes to leave property to the lessee for consideration to use or to gain proceeds from the property on a temporary basis (Bandlerova, 2016). The land is held in obligation. Land leasing is used in a variety of different contexts from retail to commercial and agricultural. In India, land leasing is a common tool used in the agricultural industry; leasing is thought to promote agricultural efficiency, equity and helps to reduce poverty (Sharma, 2016). This form of property rental can be especially useful where a property owner is in possession of a surplus of under utilized lands.





## Transfer of Development Rights

Transfer of development rights (TDR) is a zoning technique used to permanently protect farmland, natural and cultural resources by redirecting development that would otherwise occur on these resource lands towards areas planned to accommodate growth and development. Landowners within valuable agricultural, natural and cultural resource areas can be financially compensated for choosing not to develop or sell some or all of their lands. These landowners are then given an option under municipal zoning to legally sever the development rights from their land and sell these rights to another landowner or real estate development for use at another location.

The land from which the development rights have been severed is permanently protected through a conservation easement or other appropriate form of restrictive covenant. The development value of the land where the transferred development rights are applied is enhanced by allowing for new or special uses, greater density or intensity, or other regulatory flexibility that zoning without the TDR option would not have permitted. TDRs allow for owners of agricultural land to capture some of the same financial rewards

available to landowners located in areas more suitable for urban land uses (Centre for Land Use Education, 2005).

## Public Consultation

Participation by citizens and other stakeholders has often been identified as a vital element for success of growth management and open space protection efforts. Meaningful participation, starting from the outset of the planning process and occurring throughout implementation of plans, is needed if community goals and concerns are to be incorporated and local land use plans are to have legitimacy related to those affected by said plans (Bengston, Fletcher, & Nelson, 2004). Innes (1992) analyzed participatory group processes in three growth management states and found that consultation has been useful for a variety of important tasks: (1) framing the problem of growth management, (2) placing the issues on the public agenda, (3) writing growth management legislation, (4) turning general policies into specific strategies, (5) providing oversight and review of growth management laws as they are applied, and (6) negotiating differences among conflicting stakeholders.



*Community outreach event in Green Belt village (December 3, 2017).*

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### **Customized workforce, business promotion, education**

Workforce training, experience and skills, also known as human capital, are essential drivers of productivity increases and a fundamental engine of economic growth. Because workers are also less mobile than financial capital, investments in human capital are more likely to stay within a region. Newer approaches to workforce development focus less on financing and more on providing direct services to companies. Some of these services include:

#### **Job training grants**

These grants reimburse companies for the costs of training and upgrading employee skills in-house or through approved training providers. For example, Washington State's WorkStart program makes grants of \$100,000 to \$200,000 for on-the-job training in the state's target industry sectors (International Economic Development Council, 2015).

#### **Wage subsidies**

Economic Development Organizations (EDOs) may also subsidize employee wages during training to offset business costs. For example, Kings County in California provides up to 50 percent

of an employee's wages during their on-the-job training program (International Economic Development Council, 2015).

#### **Complimentary hiring assistance**

Many EDOs provide companies with labour market analysis services. Others provide recruiting, screening, and skills assessments of job candidates.

#### **Customized training programs**

EDOs partner with local colleges and other organizations to provide customized training for employers. Customized training can be the most powerful incentive for business retention and attraction. The up-front offering of customized training can have a strong effect on business location decisions, leading to an increased creation of businesses in an area and greater investment in that region (International Economic Development Council, 2015).

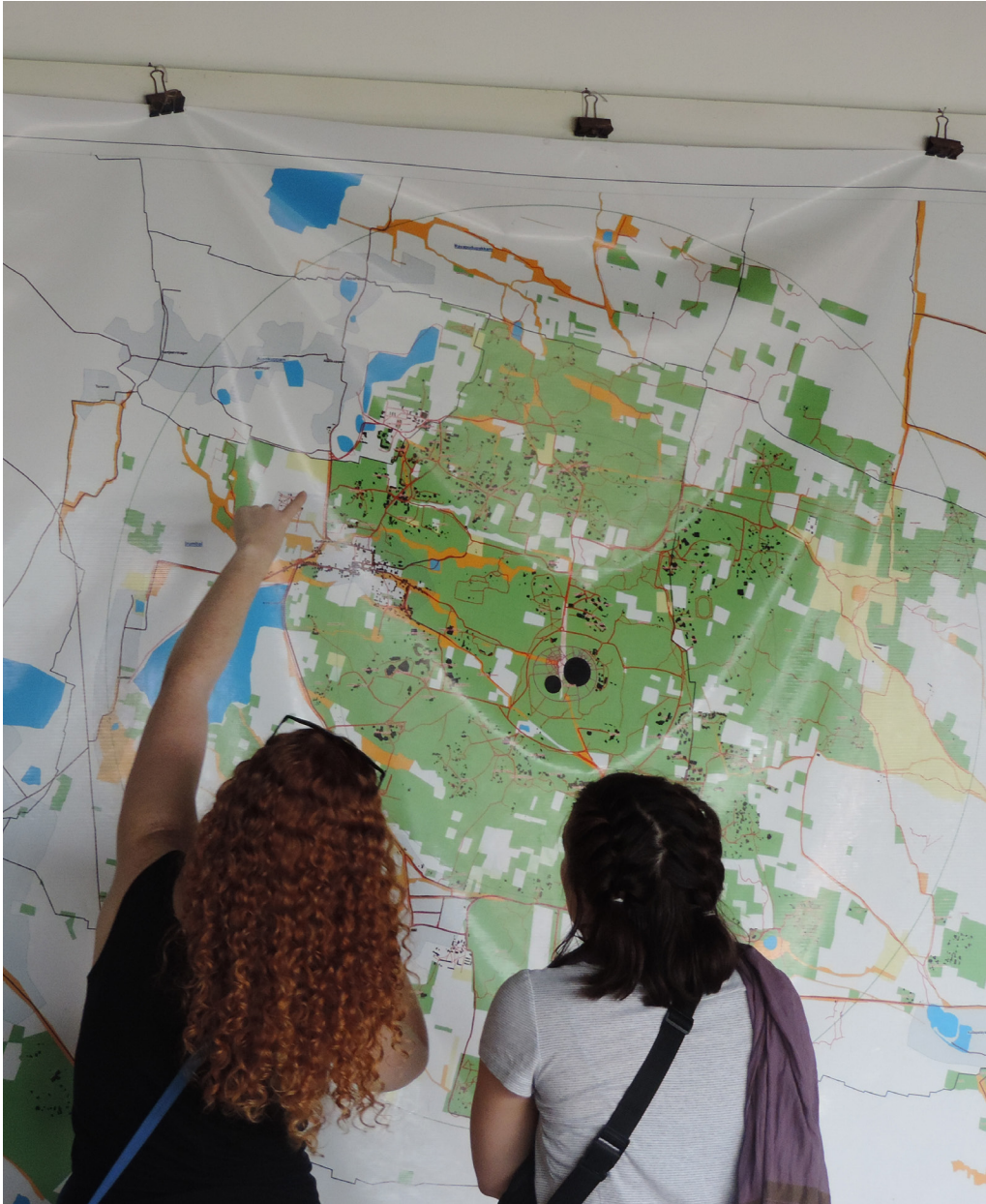
By offering residents the opportunity to learn skills for a wide range of jobs, workforce development efforts could also reduce the need for residents to commute long distances to find appropriate employment, thus improving quality of life and assisting with job/worker retention (US Environmental Protection Agency, 2016).



*Project team touring site of new community resource center (December 5, 2017).*



## 2.3 International Greenbelt Case Studies



Auroville Town Hall, L'Avenir Offices (December 8, 2017).

### Methodology

#### Objective

Case study analyses were conducted to gain knowledge of other growth management techniques within established greenbelts around the world.

Case study analyses are a valuable form of qualitative research because they help produce explanations of social phenomena that are attentive to a variety of contextual influences at various levels (Baxter, 2016). The case study analysis method provides insight on various growth management strategies within existing greenbelts from selected cases around the world. To ensure higher levels of generalizability (Baxter, 2016), a variety of case studies within an international context were selected. Initially, a large number of case studies were contemplated and broadly examined. A total of six case studies were later finalized. These represented both Canadian and international planning approaches. The six case studies were selected on the basis that they shared some form of common characteristic with Auroville and provided valuable lessons. While each of the respective case studies may not be particularly comparable in size, scale and/or context to Auroville, all of the examples provided applicable lessons to inform future growth management and greenbelt planning in Auroville.



## Greenbelt and Growth Plan *Greater Golden Horseshoe, Ontario, Canada*

**Continent:** North America  
**Size:** 720,000 ha  
**Year:** 2005

### Description

The Greater Golden Horseshoe is located in the Greater Toronto and Hamilton region. The region contains parts of Ontario's most significant ecological and hydrological natural environments, scenic landscapes, and productive farmland (Places to Grow, 2017a). The area falls under two provincially mandated policies, the Growth Plan and Greenbelt Plan. The Growth Plan and Greenbelt Plan are given legislative authority through the Places To Grow Act (2005) and Greenbelt Act (2005), respectively. The provincial plans work together to determine how and where municipalities should grow, and to protect valuable agricultural and environmental lands. Within the plans, permitted uses are determined based on three designations: The Agricultural System, The Natural Heritage System (NHS), or Settlement Areas.

The Agricultural System was designed to protect prime agricultural lands and support the agri-food network. This includes protecting infrastructure and economic activities that ensure agricultural land remains viable. The NHS identifies key hydrological features and linkages. Settlement areas have boundaries that indicate where growth and development will be directed (MMA, 2017a). Moreover, settlement areas located outside the Greenbelt may not expand into lands within the Greenbelt (MMA, 2017b). Lands within these designations are highly regulated by provincial policies and subject to strict development controls in and around the Ontario Greenbelt.



## Relevance to Auroville

- The Ontario Greenbelt and Growth Plans and Auroville's Green Belt share similar objectives and consist of primarily privately owned lands.
- The framework on how and where to grow may be applicable to Auroville in deciding which lands are most important to protect from expanding settlement in Auroville's Green Belt.
- While the provincial plans are intended to protect a larger scale area than Auroville's Green Belt, the policies are implemented on a comparable municipal scale by surrounding municipalities.
- Using a similar agricultural and natural heritage systematic approach to identify and preserve valuable ecological and agricultural lands may be applicable to protecting Auroville's rural economies and directing hamlet growth.



*Southern Ontario Greenbelt and Growth Plan map (urbantoronto.ca).*

## Lessons Learned

1

The Growth Plan provides a useful policy framework for determining how and where growth should be directed in the context of a greenbelt. This includes:

- Managing existing infrastructure, such as current wastewater and stormwater infrastructure.
- Ensuring no negative impacts on quantity and quality of water in watershed plans and avoiding hydrological features.
- Protecting prime agricultural lands should be considered when determining how and where to grow when expanding urban settlement boundaries.

2

Systematic approaches are used to identify and preserve sensitive and valuable land. The Growth Plan and the Greenbelt Plan work together to protect natural heritage systems and important agricultural land. These two specific land uses were identified and then mapped to demonstrate the locations of the most valuable land resources. This approach helps to support rural economies and ecological corridors by maintaining the connectivity of sensitive and important landscapes.

3

Strong policy and legal framework has ensured the protection of sensitive and vulnerable lands. Provincial and municipal legislation effectively regulate land use and strict development controls limit growth.



## The National Capital Greenbelt *Ottawa, Canada*

**Continent:** North America

**Size:** 20,000 ha

**Year:** 1956

### Description

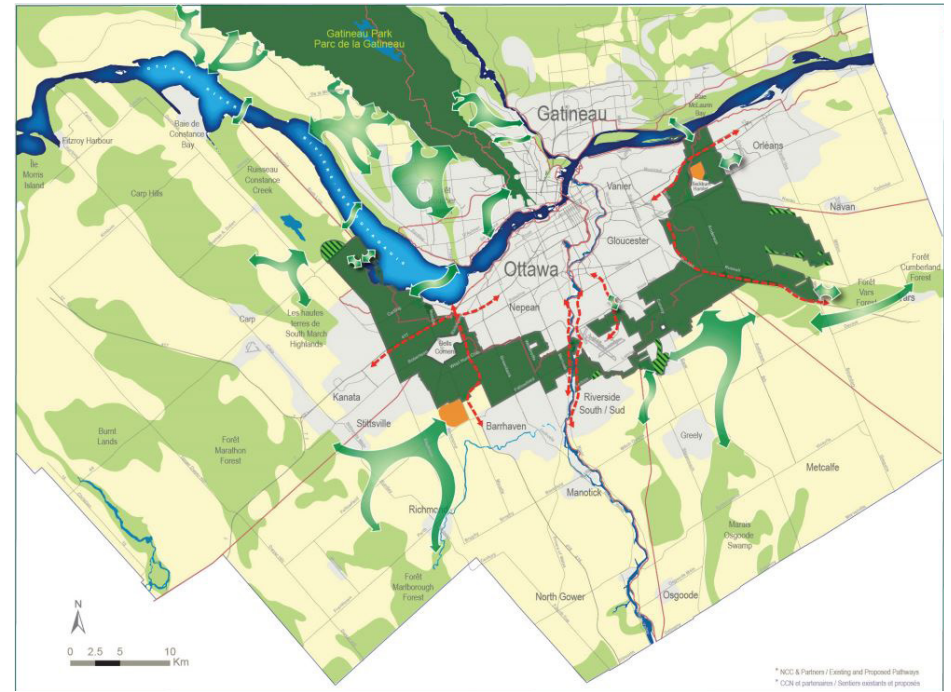
The National Capital Greenbelt lies within the urban core of the City of Ottawa and supports diverse rural landscapes, ecosystems, and recreation near the urban area. It is owned and operated primarily by the National Capital Commission (NCC), a federal agency with the authority to manage federal land in Ottawa. In 1956, the NCC started expropriating land for the Greenbelt by controversially acquiring land from the surrounding 11 municipalities. The purpose of the Greenbelt was to centralize Ottawa's future growth by preventing outward sprawl. This would enable more efficient delivery of municipal services and to reserve land for future developments, such as government buildings and private institutions (Hosse, 1960). However, in the 1970s and

1980s, growth demands instead prompted the development of satellite communities beyond the Greenbelt boundary, creating a leapfrogging effect where development continued to sprawl outwards (Amati and Taylor, 2010). Moreover, conservation was a secondary goal when the Greenbelt was initially considered (Khan, 1992). However, the natural environment is now the Greenbelt's primary role and focus (NCC, 2013).



## Relevance to Auroville

- There are multiple landowners and stakeholders operating within the Greenbelt, which is similar to Auroville's Green Belt pressures.
- The Greenbelt contained over 4,000 hectares of developed land at the time it was conceived, meaning that it can more correctly be described as a "low-density zone" (Hosse, 1960). This is similar to Auroville's Green Belt, which has various developed pockets and hamlets.
- The Greenbelt has become a staple of the National Capital identity, providing access and enjoyment to the greater public (Canada's Capital Greenbelt Master Plan, 2013). The people of Auroville also have similar sentiments to Auroville's Green Belt.



*The National Capital Greenbelt Plan map (NCC Greenbelt Plan, 2013).*

## Lessons Learned

1

The acquisition of the Greenbelt lands followed a top-down approach from the NCC down to the property owners. This created social and political tensions with the surrounding municipalities that encroached on the Greenbelt (Erickson, 2004). Using a transparent approach will assist in reducing tension among neighboring municipalities and property owners when pursuing greenbelt efforts.

2

The Greenbelt failed to contain urban sprawl. It is essential to understand population projections and take development demand into account when managing growth to prevent leap-frogging of development beyond the greenbelt.

3

The Ottawa Greenbelt failed to adhere to ecological principles of conserving spatially continuous corridors, thus resulting in only partial or isolated protection of natural systems. Creating plans that encourage collaboration among various stakeholders and landowners is key to ecological protection.



## Wellington Town Belt & Outer Green Belt *Wellington, New Zealand*

**Continent:** Oceania

**Size:** 1,760,311 ha

**Year:** 1994

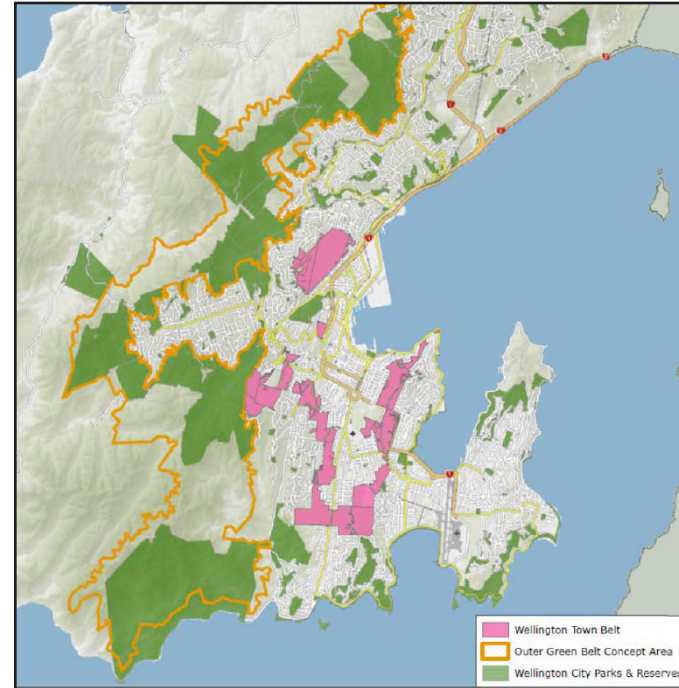
### Description

The City of Wellington has two interrelated plans, the Town Belt Management Plan (2017) and the Outer Green Belt Management Plan (2004), that provide guidelines for future ecological conservation, access to recreational areas, and cultural and historic preservation in these areas. Starting in 1873, Wellington City Council gained ownership of various lands and initiated the Town Belt Plan for the purposes of public recreation. Weak enforcement in its early years led to issues of encroachment from adjacent landowners and land claim disputes from the Maori, an indigenous Polynesian tribe (Male, 1999). The current Town

Belt Plan strengthens encroachment control related to uses and development. Wellington's Outer Green Belt Management Plan protects the skyline ridge of the hills surrounding Wellington to provide recreation for citizens, preserve the environment, and maintain the culture and history of the Maori area (Wellington's Outer Green Belt Management Plan, 2004). The Green Belt Plan outlines different methods Wellington City Council engages with landowners to achieve the goals of their Green Belt as well.

## Relevance to Auroville

- Auroville and Wellington have similar greenbelt goals, focusing on recreation and environmental conservation.
- Both municipalities are trying to control their greenbelts through purchasing land and working with private landowners.
- Focusing on education and advocacy can provide a way to advance greenbelt goals without having to purchase the land. Both municipalities want to use citizenship to empower change in their greenbelts.



Wellington Town Belt and Green Belt map.

## Lessons Learned

1

Lack of public land ownership within the Green Belt has resulted in various strategies to involve the private landowners. These include:

- Using the plan to advocate for better environmental land management;
- Negotiating with landowners to allow for public access to lands;
- Educating landowners on the goals of the Green Belt to better support the implementation of the Plan and teaching landowners how to use their lands in an ecologically sensitive manner.

2

Nine distinct areas are outlined in the Green Belt Plan, each with specific issues, goals and unique focuses, such as recreation versus environmental preservation. Each area is diverse and requires distinct considerations. All areas are connected with corridors to encourage recreation uses.

3

Wellington City Council created a strong marketing and awareness campaign to increase the awareness of the Green Belt among landowners, citizens and indigenous groups. The campaign utilized signage and flyers to promote a greater understanding of the Green Belt in the region. Overall, it created meaning for users and owners and motivated people to use the Green Belt in responsible ways.





## The São Paulo City Green Belt Biosphere Reserve *São Paulo, Brazil*

**Continent:** South America

**Size:** 1,760,311 ha

**Year:** 1994

### Description

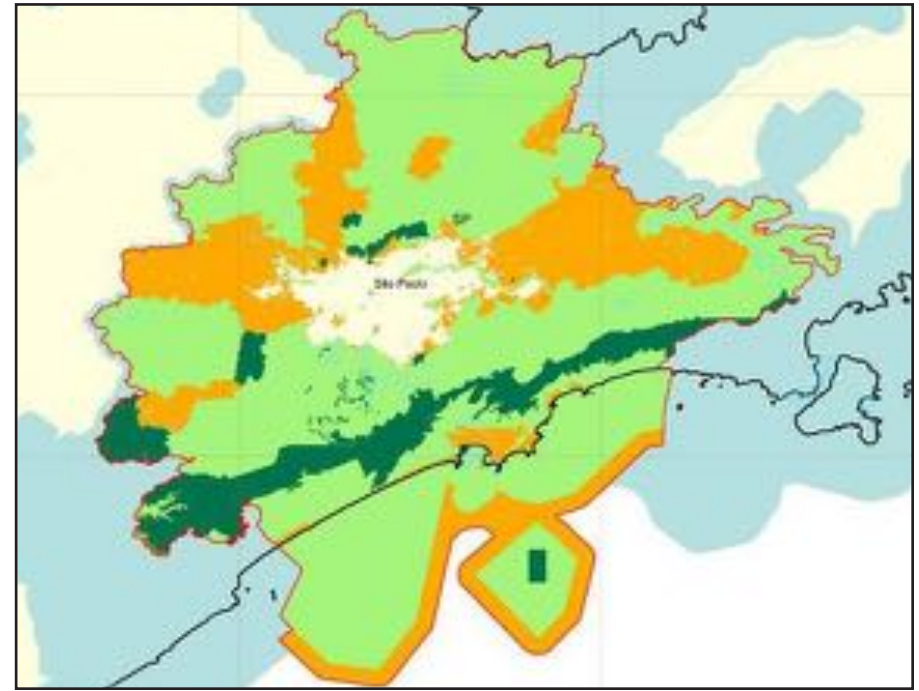
The São Paulo City Green Belt Biosphere Reserve (GBBR) encompasses the major Brazilian city of São Paulo and forms an integral portion of the larger Atlantic Forest Biosphere Reserve (Carter-Whitney, 2010). The GBBR was established in 1994 through citizenship action efforts, as the population grew frustrated with the destruction of the Atlantic Forest and its watersheds by real estate speculation (Victor et al., 2004). The result was the protection of over 1,750,000 hectares of land surrounding São Paulo and extending throughout 38 additional Brazilian municipalities (Ribeiro, 2015). The major objectives of the GBBR are to protect the natural

environment while also improving social and economic inequalities of populations within the GBBR. There are also many programs, which promote the sharing of knowledge, research, monitoring, education, training, and participatory decision-making. While there is no specific mention of the GBBR in Brazilian federal legislation, the GBBR and its programs are carried out by numerous levels of regional and local governmental bodies as well as academic and scientific institutions, non-governmental organizations, and private initiatives.



## Relevance to Auroville:

- The GBBR is a successful example of how a greenbelt can be established in the context of an emerging economy, such as India. The GBBR protects the environment while offering economic and educational opportunities to vulnerable members of the population.
- The GBBR's management model engages with public and private stakeholders in autonomous municipalities within the Green Belt so that preservation efforts and programming can be delivered to meet local needs. This is similar to what Auroville can accomplish.
- An important objective of the GBBR is to promote leading-edge research to inform worldwide preservation efforts. This aligns with Auroville's emphasis on being a progressive community, which promotes knowledge and information generation with an international focus.



*São Paulo City Green Belt Biosphere Reserve map (rbma.org).*

## Lessons Learned

1

A greenbelt does not have to be planned and implemented at a top-down level, as citizens can empower political action. Creating consensus between individuals can create a cohesive understanding of the greenbelt.

2

The utilization of creative partnerships between many institutions creates a cohesive approach to greenbelt management (Victor et al., 2004). For example, local universities carry out research and monitoring programmes in the GBBR, while enhancing its sustainability and enriching the curriculum of teaching institutions.

3

Despite greenbelts being a growth management tool, they can still contribute to the growth of the economy by creating eco-job and eco-business opportunities. For example, programs in partnership with the GBBR employ youth in recycling, ecological tourism, agro-forestry and environmental monitoring jobs (Victor et al, 2004).



## Urban Growth Boundary *Portland, United States of America*

**Continent:** North America

**Size:** 103,600 ha

**Year:** 1973

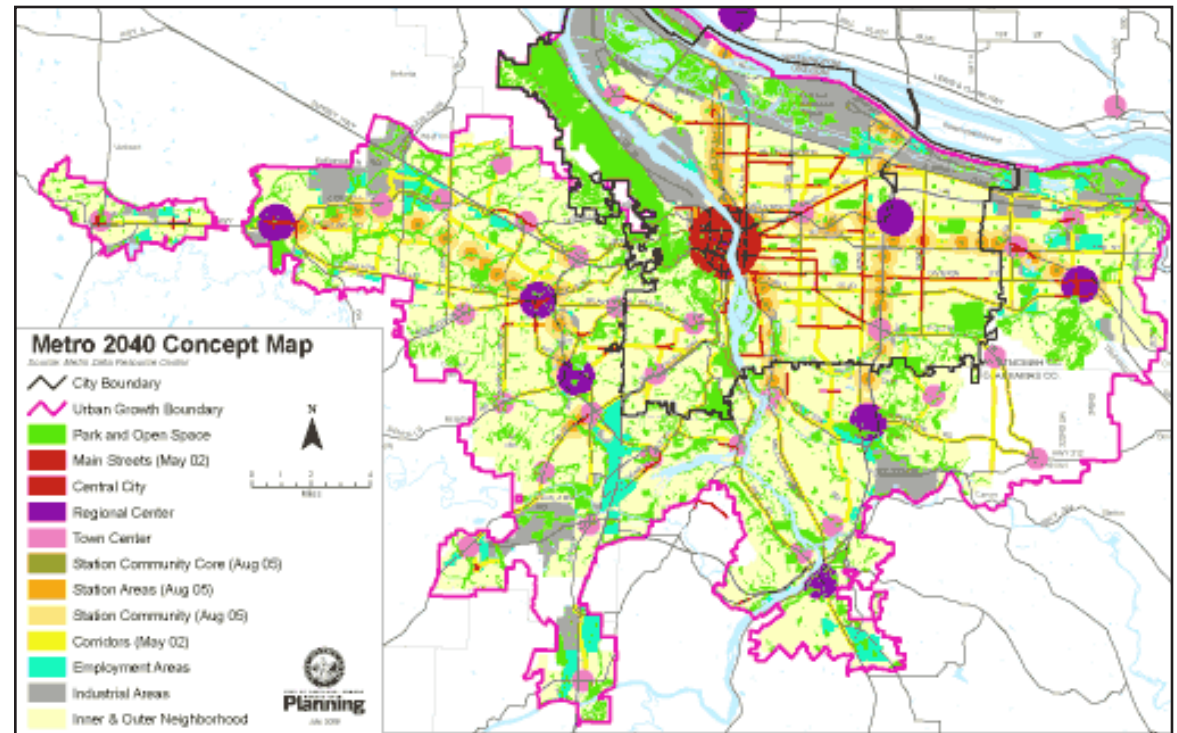
### Description:

In 1973, the Oregon State Senate gave authority to the Land Conservation and Development Commission to create mandatory Urban Growth Boundaries (UGB) around all urban centers in the state. This was to be done through greenbelts (Liberty, 2006, and Abbott and Margeim, 2008). Portland was one of the main targets of this strategy. However, social, economic and political hurdles, such as landowner disputes related to land value, made this difficult to accomplish (Jun, 2004, Grout, Jaeger and Plantinga, 2011, and Provo, 2009). Despite these challenges, Metro, a regional authority authorized to manage Portland's UGB efforts,

created the 2040 Growth Concept Plan. This plan utilized a series of growth management concepts to both encourage compact development and accommodate new residents in growth target areas. These policies included: (1) encouraging newcomers to move into satellite cities, (2) developing vacant land within the growth boundary into dense residential neighbourhoods, and (3) encouraging developers to support infill development in existing high density neighborhoods. The UGB marks the strict separation between accessible development lands and protected rural reserves.

## Relevance to Auroville

- Sustainable and organizational goals in Portland were to be achieved with a greenbelt strategy to manage urban growth, similar to Auroville's Green Belt.
- Portland's UGB required working with numerous stakeholders to regulate growth. Auroville will require similar relationship building strategies to work with the various stakeholders within the Green Belt.
- Within Portland's UGB, there are many different municipalities that are outside Portland's authority. Similarly, Auroville has to work with the villages within its Green Belt to manage growth.



Portland Urban Growth Boundary map ([portlandoregon.gov](http://portlandoregon.gov)).

## Lessons Learned

1

The Regional Authority was able to benefit from the increased value of land within the UGB through implementation of a tax policy. When the UGB was implemented, land values increased, so the Regional Authority placed a tax on the increase in the value of land. These funds were then invested into rural infrastructure and servicing for rural communities outside of the UGB.

2

Alternative methods for landowners are available to resolve land issues. Landowners can address land issues through a State Hearing Board, local city court, and state funding mediation. These methods can be used to bridge land issues and they provide a variety of systems that cater to specific needs.

3

The presence of a single government organization helps with greenbelt implementation across several jurisdictions that can often have competing interests. Metro is able to manage and balance competing political and physical planning interests. One authority is able to create a cohesive vision for the UGB and has the power to regulate development in the UGB.





## Capital Region Urban Plan Greenbelt *Seoul, South Korea*

**Continent:** Asia  
**Size:** 156,700 ha  
**Year:** 1998

### Description

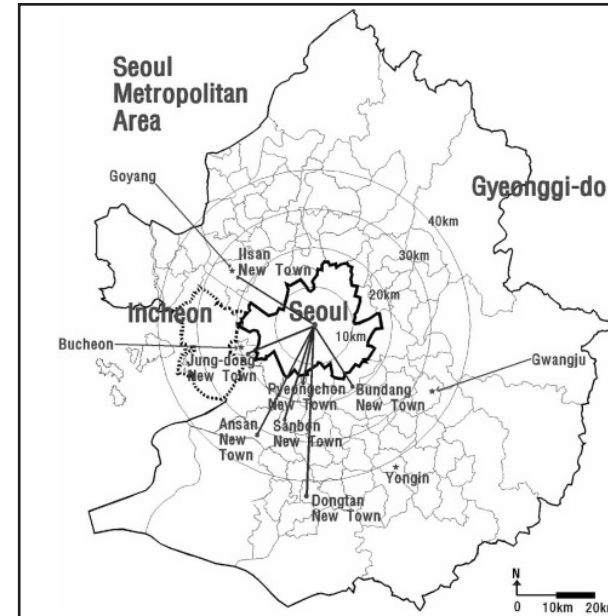
Seoul is a central city of the Seoul Metropolitan Area, which includes Seoul, Incheon, and Gyeonggi. Seoul's 1964 Capital Region Urban Plan included designing its Greenbelt within satellite towns along the corridor between Seoul and Incheon. The Greenbelt reflected many objectives: (1) to slow down population growth and industrial concentration in Seoul, (2) to prevent metropolitan sprawl that would merge Seoul with the cities of Incheon, Suwon, and Gyeongju, (3) to prevent expansion to the north because of security and military risks associated with development proximate to North Korea, and (4) to develop an environmental protection area by reserving regional open spaces such as national and regional parks, mountains and river banks, agricultural land, and later the Han River catchment area (Bae, 1998).

Korea's Greenbelt model serves as an example of top-down, centralized physical planning, as decisions are dictated by the central government's Ministry of Construction and Transportation, which is enforced by local governments (Bae, 1998). Established in 1971, Seoul's Greenbelt was originally preserved as agricultural land, with a few exceptions, such as some farmland and facilities. In 1978, the Greenbelt laws were revised, as the federal government wanted to improve the appearance of Greenbelt village towns for the upcoming Olympics. In an effort of redevelopment, urban renewal occurred in these Seoul Greenbelt villages as the government quickly stepped in and often used coercive measures to purchase land from the original owners for a low fee. The original tenants were then excluded from the entire redevelopment process and priced out of the much more expensive redeveloped homes.



## Relevance to Auroville

- Issues arose around losing traditional character and social networks when tenants were forced to move (Kim, 1990). Ensuring original character in the villages around Auroville can ensure that landowners maintain their way of life.
- Landownership issues are prevalent in the Seoul Greenbelt, as land is passed down from generation to generation and it is the only form of financial asset for many families (Kim, 1990). Auroville should focus efforts on educating and informing villagers on the proper compensation they should be receiving for their property.



Seoul Capital Region Greenbelt map (Jaeseong Cho, 2005).

## Lessons Learned

1

The top-down approach taken by the Korean government restricts local government autonomy and, in turn, hinders local governments from consulting with Greenbelt villages and including them in decision-making. Public consultation is necessary to provide local residents with a lack of financial knowledge with transparent and understandable information.

2

Urban renewal and redevelopment within these villages can cause feelings of displacement and segregation between established members and newcomers (Kim, 1990). It is important to protect socially and culturally stable communities that may exist within Greenbelt villages.

3

Selective redevelopment opportunities within a restrictive greenbelt attract real estate speculators, as is the case in South Korea. Financially competent outsiders may take advantage of original landowners' lack of knowledge. Moreover, inadequate policy protection can result in displaced original landowners. It is recommended to transfer the responsibility of greenbelts to local governments and authorities that are more aware of their local land and housing market conditions.

4

Environmental conservation principles within greenbelt policy must be enforced strictly, and monitoring processes must be clearly defined to ensure ecological protection. Conservation policies are more appropriate than preservation policies for facilitating both natural resources and the human environment.

## 2.4 Interviews and Focus Groups

### Methodology

#### Objective

The goal of these interviews and focus groups was to understand the current growth pressures in the Auroville Green Belt and contextualize what worked and what did not for growth management in the past. This method also provided an opportunity to understand what current users of the Green Belt would desire in the Growth Management Framework.

Interviews were a significant methodological component of this project. The information gathered through interviews was used to define the scope of the problem and identify potential solutions. The objectives of these interviews were to gain an understanding of current Auroville Green Belt growth pressures, contextualize the Auroville planning environment, examine relationships between Auroville and the surrounding villages, and understand the preferences that various users of the Green Belt have for these lands. Focus groups, which are semi-structured group interviews, were also conducted. Focus group interviews allowed the team to gather many opinions at once, confirm similar perspectives shared by multiple stakeholders, and have multilateral discussions on topics impacting a wide range of people.

To identify potential interviewees, a stakeholder analysis was conducted. Interviews were arranged mainly by correspondence facilitated by the client with identified stakeholders and resource persons. The international nature of this project meant that two types of interviews were conducted. Remote work in Canada involved pre-departure interviews that were carried out by telephone or Skype. The fieldwork component in Auroville meant that interviews

could be conducted in person. To keep the scope manageable for the available time given to conduct this work, this fieldwork focused on Alankuppam, a small community of 2,800 individuals located inside the Green Belt. A flexible, semi-structured and informal interview model for all interviews was selected. The research team created a pre-defined set of questions prior to each interview, but the order and questioning was flexible throughout the course of the interview, as new information was uncovered. This was meant to afford flexibility and allow interviewers to ask for clarification of points when necessary throughout the interview (Dunn, 2010). Each interview contained both general questions and specific questions to the participant's area of expertise. Interview guides for each category of interviewee are attached in Appendix A.

To assess the interview procedure prior to implementing it, a test interview was conducted to gather feedback on the questions and interview process. Feedback from this test interview was then incorporated into proceeding interviews (Dunn, 2016). In some cases, an in-person interview was also scheduled with an informant who was interviewed remotely. Due to the difficulty of connection when carrying out remote interviews, two team members took detailed notes while another conducted the interview via telephone or Skype. Second interviews provided the opportunity for follow-up questions, which were more directed to the participants area of expertise or interest. Unstructured interviews were also conducted to gather personal accounts of the growth in Alankuppam and to reduce the language barrier challenge with village residents.

Seventeen informal and semi-structured interviews were conducted with 19 people in total. The interviewees included ten Auroville resource persons, six village resource persons, and three state planners from Puducherry. Specifically, the Auroville resource persons included seven Auroville planners, one Auroville GIS

specialist, one Auroville farming specialist, and one member of the Auroville Land Trust. Three Auroville planners were interviewed a second time. Village resource persons interviewed included community leaders, key leaders of village resource programs, and organizational heads in the Green Belt. In addition to these interviews, two focus groups were held: one with a group of Auroville planners and one with a group of village leaders. The village focus group was facilitated and moderated by the Village Action Group, and 10-15 village leaders were present. Lastly, the project team attended a workshop facilitated by women village leaders at a village community centre. The breadth of interests and opinions represented by these groups ensured that differing stakes were accounted for.



*Project team members conduct an interview (December 8, 2017).*

## What We Heard

There were several common emerging themes that were identified and reinforced throughout the interviews, focus groups and workshop. The themes identified were: Green Belt awareness, Green Belt management and regulation, environmental initiatives, real estate, future growth, agriculture, relationships, and economic and social sustainability of villages. Opinions and viewpoints on these issues differed amongst participants, and are summarized below.

### Green Belt Awareness

Awareness of Auroville's Green Belt came up as a common theme from both villagers and planners. Auroville planners indicated that they were largely aware of the Green Belt and its policies as laid out by the Green Belt Master Plan. They indicated they were aware of the Green Belt's aims for water conservation, environmental sustainability, and the creation of a buffer to the outside world.

Auroville planners mostly agreed that villagers were not aware of the Green Belt and its aims. This finding was supported by the focus group with the villagers, as many indicated that they and others in their villages were unaware about the Green Belt. Interestingly, they also mentioned that male villagers were more likely to be aware of the Green Belt than were female villagers. Further, many mentioned that there is little effort from Auroville to communicate the intended purpose of the Green Belt with villagers. Planners also identified greater education and communication of the Green Belt and its purposes as one aspect where improvement is needed.



## Green Belt Management and Regulation

Being a central piece to this report, the management and regulation of the Green Belt was a common topic that was discussed during the interviews.

### Regulation

The majority of Auroville planners intend agriculture and forestry to be the main land use in the Green Belt. However, adequately regulating land use and development so that these land uses could be realized was commonly seen as an issue by Auroville planners. Land use in the Green Belt is protected only through guidelines laid out within the Green Belt Development Plan (2011), and these guidelines are not supported by any established land use laws. A planner mentioned that state planning authorities have the jurisdiction to grant protection status of the Green Belt, which would legitimize Green Belt policies and protect the intended land uses. The planner mentioned that gaining this status was an important part of the process for protecting the Green Belt. However, this is hindered by the relationship with the state, which is sometimes disjointed and uncooperative.

### Management

An Auroville Land Trust member clarified that once a land title is in the name of the Auroville Foundation, Auroville then manages the land from there. It was heard from a few interview subjects that Auroville should use their lands for more intensive uses, instead of allowing the land to remain unused or left fallow. In this way, Auroville can demonstrate to landowners how to use their lands productively. Ultimately, Auroville needs to put value on the lands they already own.

### Infrastructure

It was also highlighted by a planner that Auroville knows very little about the current infrastructure within its own Green Belt. Moreover, the GIS specialist confirmed that the Green Belt and its associated cadastral, environmental, and topographic features have only been partially mapped. As all data was collected by consultants, the accuracy or quality of data was difficult to maintain.

One suggestion offered to improve the mapping process is to establish and train an Auroville in-house team for data collection and surveying. This would ensure that data collection is carried out by people who have a long-term stake in data collection and quality. More surveys are needed to understand the full state of infrastructure in the area and any new developments that are happening in the Green Belt.



*Greenbelt awareness signage in the Ontario Greenbelt (greenbelt.ca).*



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## Environmental Initiatives

### Environmental Objectives of the Green Belt

The majority of Auroville planners identified the overarching aims of their environmental protection efforts as being to help Auroville become a self-sustaining community, to conserve natural resources so that future growth could be possible, and to conserve water resources. Village resource persons identified that they wanted environmental protection efforts to be aimed at protecting water resources. They see the depletion of water resources as the most significant environmental issue.

A village resource person mentioned that they think the definition of sustainability given by the Green Belt Development Plan (2011) is too narrow. Further, they mentioned Auroville should re-conceptualize the definition to include the economic and social sustainability of the Green Belt area as well.

### Current & Future Environmental Initiatives

Many sources mentioned a weakness in Auroville's current Green Belt protection efforts is the lack of maintenance on already purchased lands. They mentioned that Auroville tends to not maintain or carry out any programming on lands purchased for preservation. This leads to an issue with wildlife grazing, confusion over land ownership, and unintended uses being established on these lands by others. Demarcating land with fences, establishing signage, or including more programming opportunities were identified as mechanisms to protect forested lands from encroachment.

An Auroville GIS specialist mentioned four key areas where mapping data is missing: soil quality, biodiversity, accurate contour maps, and detailed infrastructure maps. It is thought that mapping these environmental variables is vital to direct future Green Belt conservation efforts and land purchasing.

The project team heard from an Auroville resource person that

the Perspective Master Plan (2001) and Green Belt Development Plan (2011) are based on geometric forms that do not reconcile proposed land uses with the lands that would be best suited to support them environmentally. It was suggested for Auroville to become more fluid in land use planning, while still respecting the cultural significance of the forms these plans propose.

### Environmental Sustainability & the Villages

An Auroville planner mentioned the importance of incorporating the wants and needs of villages into planning for the Green Belt's environmental sustainability. It was stated that villagers should be able to define how they want to grow and what environmental attributes they want to protect.

A village resource person highlighted the importance of using villagers' traditional knowledge to inform how sustainability is defined and carried out in the Green Belt. For example, it was mentioned that traditional practices of watershed management, which have been practiced on the lands for hundreds of years, could be useful. Several villagers expressed that they view knowledge sharing as a "two-way street". There are benefits from Auroville learning from the villages just as there are benefits from the villages learning from Auroville.

## Real Estate

The real estate strategies and processes that Auroville uses to purchase, lease or manage land is important for understanding growth management within Auroville and was a common topic in the interviews conducted.

### Land Purchasing

Various planners offered reasons for why few land sales to Auroville are occurring. First, land ownership is related to social status, making landowners reluctant to sell. Second, real estate speculators offer higher prices for the land than Auroville believes it is worth, meaning they are more likely to sell to outside purchasers.

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Alternatively, one planner said many of the lands within the Green Belt are not serviced, and this lack of servicing acts as a deterrent for real estate speculators. Also, most real estate speculation within the region has been deterred by the processes of No Objection Certificates (NOC). This system was identified as only partially successful, as it was said that there are also many developers who ignore and bypass obtaining NOCs from Auroville and choose to develop anyways.

Another commonly occurring issue that was brought up by many is the lengthy process of undertaking a land purchase. Land purchases predominantly occur after current landowners approach Auroville. Often many individuals share the deed to a single piece of land and all must be in agreement in order to sell. This legal process to ensure proper documentation and approvals from all landowners can take years. An Auroville planner also pointed out that many landowners utilize the Auroville Land Board to take advantage of their land assessments, even though they have no intention of selling their land.

Recommendations from Auroville planners offered three ideas for increasing Auroville's ability to obtain the rest of the Green Belt lands:

- Work with corporations and their social responsibility fund to help with land purchasing. Propose social projects like building schools to show how high value propositions can help Auroville. Ideally, this would leave the Auroville name out of the process and allow land purchases to be made as a third party, thus expediting the process.
- Garner more federal government support by showing what Auroville can do for India and how the ideals laid out by the Auroville Charter can help humanity.
- Increase awareness of Auroville across the world, and, through this, establish connections with donors.

## **Land Leasing**

A few planners and the Auroville Land Trust member spoke about land leasing as a strategy that Auroville uses in the Green Belt. Land leasing from other landowners is done in some instances to allow Auroville to establish the land uses that they want. The Auroville farming expert talked about “peppercorn leasing” as being a way for Auroville to establish ownership over their land while still allowing farmers to use it. This is done by charging a minimal fee to farmers to informally use Auroville lands, thus ensuring that ownership rights are maintained and creating a relationship with those working on the land.

Some of the planners and the Land Board expert explained Auroville uses land exchanges as way to secure land within the Green Belt. This strategy is seen as an amicable scenario because it allows landowners to continue to own land but secures Green Belt land for Auroville. This is a better way for Auroville to obtain land, as it is a “less aggressive” form of obtaining land. Auroville will exchange lands outside the Green Belt for privately owned lands within the Green Belt. These landowners are looking for value exchange of lands, meaning that many are not interested in outright selling their land.

## **Land Management**

As heard from a group of planners, mismanagement and a lack of accountability at the government level can sometimes create issues when trying to regulate development. Law enforcement is also minimal, and developers often do not follow proper planning procedures.

The issue of how much land is still available to be purchased was discussed in many interviews. As heard from the member of the Land Trust, there are only about 1,200 acres of land left to be purchased within the Green Belt. Most land cannot be purchased because lands are owned by the villages, the state and federal governments, or are temple lands that are not for sale.

The state authority planners that were interviewed discussed other methods of growth management, which included transfer of development rights (TDR). They mentioned that TDRs are not currently discussed in the *Planning Act*, but they said they hoped that this would change soon. They expressed interest in TDRs as a growth management tool.

Issues of how Auroville deals the land after it is purchased were also commonly stated in few interviews. The Auroville farming specialist spoke about Auroville needing to take active responsibility for land once it is purchased to prevent land encroachment and maintain ownership of the land.

Communication and relationship building was a common theme in most interviews and focus groups as well. When dealing with so many stakeholders on the potentially volatile issues of growth and development, creating strong relationships was stated as important.

## Future Growth

Many sources agreed that Auroville and the surrounding villages are growing at different rates, and they acknowledged that these differing growth rates add complexity to the planning process. Additionally, it was a unanimous finding in interviews that the futures of both the villages and Auroville will include the presence of a growing tourism industry.

### Growth of Auroville

Due to the process necessary to become a member of Auroville and its unique demographic profile, Auroville's growth is comparably slow. An Auroville planner said this makes it difficult to project Auroville's future population, economic growth pressures, and resource requirements. Additionally, an Auroville planner said Auroville's original intent to reach 50,000 people is not practical because the land carrying capacity cannot support this.



*Green Belt residents prepare for local celebrations (December 3, 2017).*



## Growth of Villages

Several Auroville planners agreed that villages around Auroville were growing much faster than Auroville. These planners mentioned that they would like to help the villages determine their future growth goals and create a directed growth strategy. The main goal of helping the villages grow would be to increase the villages' quality of life. An Auroville planner also mentioned that, instead of limiting or restricting village growth, it is important to find ways for the villages to grow while maintaining their traditions and integrating with Auroville.

Interviews with state authority planners identified that a draft plan for the growth of all Puducherry villages has already been submitted to the federal planning authority for approval. These plans were created by a top-down process to account for the changing population targets, market forces, political pressures, and traffic demands in the villages. Auroville has not been consulted on these plans, but there is a 60-day review period presently underway in which objections to these plans can be raised. Moreover, state planners said they do not perceive the future growth anticipated in Alankuppam to be problematic, as the area is seen as having vacant land available to support future growth.

A village resource person said that economically and socially sustainable growth in the villages should be done through inspiring the villagers to use the knowledge they already have rather than teaching them how to replicate other growth patterns. The traditional knowledge villagers possess is unique and practical, and villagers should not be taught to recreate development that has already occurred (e.g. Auroville or Western development). Alternatively, inspiring villagers to creatively shift to changing demands using their own ideas will help them determine creative solutions that are well suited to the context.



*Project team touring site of new community resource center (December 5, 2017).*

## Agriculture

### Future of Agriculture in the Green Belt

Green Belt villagers, Auroville planners, and state authority planners unanimously agreed that a strong agricultural sector is necessary to sustain the area, and that agriculture should be included as a very important land use in the Green Belt. Village leaders view a strong agricultural sector as vital to their future livelihood, a necessity for the economy, and a requirement to ensure access to adequate food sources. Auroville planners mentioned that they would like to increase the viability of farming in the Green Belt by incentivizing villagers to become farmers. Lastly, state planners determined that the long-term vision intended for the area includes predominately agriculture.



### **Farming Resources**

A village resource person mentioned that the creation of a discussion space or forum for farmers to converse openly would be useful to promote agriculture in the Green Belt. They envisioned practitioners and villagers using this space to compare practices and disseminate information on policy changes or market shifts regarding agriculture. Village resource persons also mentioned that farmers could use support from Auroville to better connect them to government assistance for agriculture. The Auroville farming specialist also mentioned that creating a recipe book of traditional food recipes that incorporated local crops could increase the popularity of the crops viable within the Green Belt.

### **Challenges to Farming in the Green Belt**

Auroville planners and the farming specialist identified several challenges to farming in the Green Belt. Firstly, the small farm lot sizes in the Green Belt inhibit the economic viability of these endeavors. Second, soil quality and a lack of water resources is a challenge to farming in the Green Belt. Third, the farming specialist mentioned that Auroville, the most sizable market for food in the area, consumes a diet sourced from all over the world that cannot realistically be grown locally. One Auroville planner also went as far as saying that farming is not viable at all within the Green Belt. However, it is important to note that this view was uncommon among interview participants.

A major barrier to farming, which both Auroville planners and villagers emphasized, was the negative perception the village communities have of farmers. While farming is viewed as necessary and important to the vitality of villages, not many villagers strive to become farmers because farming is looked down upon as not being a respectable profession. Further, there is a stigma attached to many of the crops that are best suited to be grown in the area, and these crops are seen as “poor person’s food”. There also is not enough government support for farming and it is difficult to hire farm labourers. Generational trends regarding farming practices are also deeply embedded in the villages, meaning that changing farming practices to adopt to new methods can be difficult.

### **Organic Farming in the Green Belt**

Auroville planners have emphasized that they want to see growth in organic agriculture and more sustainable farming practices in the Green Belt, representing a shift away from traditional farming practices. The Auroville farming specialist and several village representatives all mentioned that this shift is not currently viable, as there is no market for organic produce other than the small market provided by Auroville. Produce markets elsewhere are indifferent to whether harvesting is done organically, meaning that organic produce does not receive a premium over similar conventionally farmed produce. The Auroville farming specialist



said that the organic certification process would require a large investment for farmers and pose a big risk for their already small profit margins, and this deters villagers from engaging in these practices.

## Relationships

### Relationship with Villagers

Villagers identified that they could use more support from Auroville in interacting with the government. They find upper levels of government difficult to work with, and want help attaining government services such as solid waste management and increased access to fresh water. The villagers agree that communication between Auroville and the villages can be greatly improved. They expressed that Auroville was “all talk and no action,” and are quick to create new committees that they rarely follow through on. The villagers mentioned that another hindrance to communication with Auroville was their own internal village politics.



*Community visioning workshop in Alankuppam (December 9, 2017).*

Many Auroville planners talked about the Village Development Committees. These committees meet monthly to determine the needs of each village. Through this channel, Auroville is working with all villages to find common ground on development goals. Ideally, Auroville wants to prepare master plans for each village with its associated Committee. These Committees will ideally assist the Auroville Perspective Master Plan in being more meaningful, considering the growth of the villages, and determining proper joint wastewater and watershed management efforts.

Many interviewees identified that bottom-up planning processes are necessary to shape a planning strategy that meets the needs of villages. As heard in the community workshop, there is a communication barrier between Auroville and the villages. This was said to cause misunderstandings and a discontinuity of efforts. For Green Belt and sustainability ideals to be realized, it is necessary to work together as a bioregion. Many of the informants stressed the need for improved communication and the sharing of resources between Auroville and the villages. One Auroville planner mentioned that the reason for the lack of communication is that Auroville lacks the time and resources to effectively engage with the villages.

### Relationships with Other Levels of Government

The focus group with Auroville planners stated that Auroville's working relationship with the government of Tamil Nadu is not well established, and planners see strengthening this relationship as necessary for carrying out their vision of the Green Belt. This feeling was shared by the state planners that were interviewed, and they stated that Auroville has not put in much effort to create a stronger unified relationship. However, state planners said they would welcome these efforts.

### Internal Auroville Communication

Communication within Auroville came up as another source of frustration in a few interviews. Auroville planners identified weaknesses in communication within Auroville. An information



disconnect was identified between Auroville's leaders and Auroville's residents. One interviewee said Auroville has to work on fixing their government structures to ensure things operate more efficiently internally. Another Auroville planner said there is a disconnect between various groups within Auroville because there is no direct contact person. Because of this, long-term relationships and initiatives tend to diminish quickly.

## Economic & Social Sustainability

### Auroville's Role in the Villages' Economic & Social Sustainability

Several village leaders expressed that they are thankful for the skills training and economic opportunities that Auroville has given them. Similarly, Aurovilians see themselves as having the ability to increase social sustainability through supporting disempowered groups within the villages.

However, several Auroville planners and villagers expressed that Auroville could help villagers further by providing more employment for village women and more social infrastructure, such as schools. Conversely, a few Auroville planners did say that they felt as though the villagers had grown accustomed to receiving handouts and support from Auroville in a way that takes advantage of their resources.

An Auroville planner mentioned that there needs to be a balance between wanting to protect the Green Belt and wanting the villages to be able to realize development as they see necessary to their growth. Auroville has to reconcile the rights of the villages along with their own sustainability goals for the Green Belt. To do this, Auroville planners mentioned that they must work multilaterally with landowners to create plans for future growth.

### Obstacles to Economic and Social Sustainability of Villages

An Auroville planner mentioned that government mismanagement and the caste system are two systemic problems that Auroville sees as obstacles the villages face for social and economic sustainability.

Villagers expressed that sustainable growth is sometimes a secondary concern after ensuring that their fundamental needs are met. For example, selling land is often the only method villagers have to raise the revenue necessary to allow their children to have a better life. The money raised through land sales makes it possible for villagers to afford education for their children, to fund traditional weddings for their daughters, and to finance building new homes for themselves.

### Preserving Cultural Heritage

Many village resource persons view cultural heritage as critical to the future of villages and expressed the importance of incorporating traditional knowledge into planning. A village resource person mentioned that traditional practices are inherently sustainable, as villagers have been using them for the past 2,000 years to sustain themselves. To preserve cultural heritage, more support is needed to strengthen the opportunities for villagers to engage in traditional handiwork, crafts and trades.

Interestingly, a village resource person mentioned that tourism would not necessarily impede the cultural heritage of the villages if it were carried out in the correct way. Educational tourism centred around villagers teaching visitors important cultural skills could enhance the economic opportunities in villages, promote local skills and establish networks to preserve traditional knowledge.

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# chapter 3

## POSSIBLE SOLUTIONS

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## 3.1 Introduction

The following section outlines possible solutions Auroville may combine to gather further information on the growth pressures occurring in the Green Belt. The proposed solutions have been categorized thematically according to our research:

### Themes

1. Land use
2. Market-based
3. Environmental
4. Social

These themes were chosen because they closely relate to Auroville's overall vision for the region. Many of the proposed solutions apply across multiple categories, however, for clarity, they have been allotted to the most applicable category. The proposed solutions offer both long and short-term techniques that address the key issues currently occurring within the Auroville Green Belt.





## 3.2 Land Use Solutions

### Land Use Overview

When managing growth and development, it is essential to analyze and evaluate various land uses. Defining land uses will determine how land will be utilized moving forward. It is important to ensure that land uses are outlined and monitored using accurate data and maps. This allows for needs, such as water, electricity, and public institutions, to be prioritized. It also allows planners to anticipate growth trends in both population and housing. Interviews and remote research have identified existing land use strategies and challenges in Auroville. The following subsection outlines these land use strategies and how they can be further refined to manage growth.



*New community resource center under construction in Alankuppam (December 5, 2017).*

### Data Collection & Mapping for Land Use Planning

Mapping is an essential component to understanding the geographical context of a region, including land forms, soil, and vegetation. It can also be used to understand the distribution of demographic attributes such as gender, age and household income. Infrastructure such as roads, water wells and utility lines are also important features to pinpoint so that future needs and growth can be tracked. In the context of Auroville's Green Belt, mapping provides a visual interpretation of changes occurring in the Green Belt. Identifying infrastructure will allow Auroville to better manage future development. In some cases, development is dependent on connection to public infrastructure. By identifying where infrastructure is located, mapping can assist regional planning efforts.

#### Current Practices

Interviews and research revealed that Auroville has a variety of maps available that are useful to understanding the region. In the past, Auroville has hired various outside consultants to survey the lands. However, an Auroville GIS Specialist revealed that the accuracy and quality of the data from different consultants varies. Additionally, there is an ongoing issue with the consistent collection of metadata. Without this information, it is difficult to determine whether the maps need to be updated.

Aside from Auroville's current mapping, interviews with state planners from Puducherry highlighted that surveying was done in 2014 to inform a long-term plan for villages in Puducherry, including Alankuppam. This survey included land use mapping which can



contribute to understanding land management and future growth in some of the Green Belt villages.

## Areas for Improvement

Despite having a catalogue of useful maps, some key land use maps are incomplete or missing from Auroville's current inventory. These include maps on soil quality, biodiversity, contour maps, and underground infrastructure such as water pipes. It is imperative that Auroville prioritizes the proper surveying of land. This will result in more reliable mapping of various land uses, features and built sites.

From interviews, it was stated that reallocating more workers to survey Green Belt lands is needed because it is beneficial to protecting the lands and managing growth. Interviewees recommended that the hiring of outside consultants may not be the most beneficial strategy because consultants external to Auroville may have different standards of surveying and data collection. Therefore, hiring an in-house team from the region, including the villages, to survey the lands may yield more accurate and thorough results. This is because they have a long-term stake in the accuracy of the results since the mapping of land will influence their communities. If it is determined that there is not an adequate number of professional surveyors from Auroville, a program can be established that provides training to locals who are interested in a land surveying career.

Ambiguous ownership and division of land has led to land disputes, which have been challenging and resource-intensive for the Land Board to settle. All property parcels are mapped out, but land ownership information is currently unavailable. Subdivisions of land happen at a fast rate, and the subsequent sale of lands is difficult to track and monitor. Having a record of sales and transfers could be beneficial. An internal interactive map that is continually updated could show ownership status and information, which would make managing growth and development much more

accessible to Auroville planners and staff.

## Next Steps:

- Prioritize resources to include the land surveying of missing land data needed to map demographics and infrastructure
- Establish a data checklist to properly inventory and catalogue existing maps and determine where more data needs to be collected
- Establish a record of sales and transfers of land within Auroville Green Belt area



# Population Projections

Population projections are important to understanding how and where growth will occur within a community. Knowing this information will allow for better servicing of utilities, infrastructure, institutions, and housing. Population projections are important to Auroville because it has growth pressures on its periphery that have been challenging to address.

## Current Practices

According to interviews, Auroville has tried to create a population projection in the past, to limited success. Auroville currently does not have a proper population projection method to predict the population going forward. This is because Auroville has different mechanisms that drive growth within it. It is challenging because



Pondicherry Bazaar (December 10, 2017).

new residents relocate to Auroville based on intangible social values. This differs from the typical economic model geared more towards market factors such as employment and land value. Furthermore, from a regional context, the 2011 Census of India provides data on the surrounding villages that are detailed enough to provide a rudimentary projection of the surrounding region. This includes data on population cohorts. This could be useful for Auroville's understanding of the region's population and growth.

## Areas for Improvement

Due to Auroville's unique social context, it has been recognized that a carrying capacity analysis may be more beneficial than a typical population projection model within Auroville and the surrounding villages. A carrying capacity analysis focuses on resource pressures and constraints, such as drinking water availability. This is an essential determinant in sustaining the current population and fostering future growth. The proper surveys on resource availability have not yet been completed. An Auroville planner provided a recommendation for future surveys to be conducted. First, a water survey should be completed, then a land survey which will be followed by an employment and housing survey.

### Next Steps:

- Complete water, land, employment and housing surveys to better inform strategies on resource availability
- Conduct a carrying capacity analysis to highlight what resources are available to Auroville and the surrounding villages to determine where resource prioritization is needed



# Infrastructure Assessment

Infrastructure is comprised of the structures used to service society. These include facilities and various servicing utilities such as roads, sewers and power supplies. Maintaining adequate infrastructure and providing access to services is essential to the successful operation of a town. Currently, Auroville faces considerable infrastructure challenges that have been identified through interviews and are summarized below.

## Current Practices

Auroville planners stated that water quality and availability is considered a top issue for Auroville. A lack of access to drinkable water is an issue for the general population in the Green Belt region outside of Auroville. Interviews highlighted this problem as being connected to the lack of proper solid waste and sewage infrastructure in the villages, contributing to the presence of grey water. Additionally, the villages lack the facilities to convert grey water into potable water.

An Auroville planner said that the Western sector of the town is planned to receive a large water purification plant in the near future, which will provide further access to safe drinking water in Auroville and help service the surrounding villages to the West. Further, Auroville continues to plant trees to initiate groundwater recharge and residents continue to exercise sustainable household water use. However, from interviews, it was discovered that some developers are pumping water from a vulnerable sector of the water table, and this has yet to be properly addressed.

Solid waste and sewage infrastructure is another challenge. It was discovered through interviews that the collecting and processing of waste can be improved. Both sewage and solid waste management are important, however, Auroville is currently unable to mitigate the sewage issue in villages. Presently, solid waste management is being addressed through community initiatives with the Village

Action Group. This initiative educates the villagers on what items are recyclable and biodegradable and which ones are simply waste. Local village women are currently working to become the sole contractor of waste collection services that sort improperly disposed waste.

Electrical and telecommunications infrastructure are also important to continually monitor and assess. Interviews with Auroville planners revealed that the documenting of this type of infrastructure can be improved. This lack of available data can influence the accuracy of GIS maps and can increase the time and effort needed to survey land. From interviews with Auroville planners, concern has been expressed about the location of electrical services in the Auroville Green Belt.

The Green Belt regional road network is an essential public infrastructure component because of its influence on adjacent business development and tourism. In Auroville, the presence of a main road leading towards the Matrimandir, a tourist destination, creates increased traffic and an opportunity for businesses to profit from tourism by developing in the surrounding areas (Revi, 2007). This increase in traffic has led to safety concerns, which were highlighted in an interview with a village resource person. Auroville planners stated they recognize Auroville's role in increasing road traffic and have been lobbying the state government to create a bypass road to alleviate traffic and safety concerns.

## Areas for Improvement

Auroville needs to be aware of its influence on tourist-related activities in the surrounding area. The increase in tourism in recent years has put a strain on existing infrastructure. In order to plan for future tourism trends, visitor counts and other tourism studies should be undertaken in areas intended for tourism, such as the Visitor Centre. If done effectively, this can better identify future economic growth trends in the region.



With regards to existing services in the Green Belt, there is a need to map out the extent of electrical lines in the region surrounding Auroville, with the long-term goal of helping supply more electricity from Auroville to assist the local villages. It was revealed by Auroville planners that not all electrical lines are registered when they are installed, creating confusion as to how many are present and where they are leading to. This makes it difficult to maintain an inventory and understand the extent of current electrical services. Therefore, an infrastructure survey should also be conducted with an emphasis on the electrical lines. This would help in the estimation of costs surrounding future service provisions for Green Belt villages.

There are many areas within water services that need to be improved before a strategy for growth management can be established. This includes conducting an analysis of water recharge rates in the region and an infrastructure survey of the location of water wells. These will be important in all efforts to sustain water resources for future generations. In addition, it was revealed through interviews that a more in-depth study regarding the water table level needs

to be undertaken to provide a more accurate understanding of the water supply.

### Next Steps:

- Conduct tourism studies to understand tourist impacts on infrastructure sustainability
- Prepare a water carrying capacity analysis to interpret data on water recharge rate and regional water availability
- Complete infrastructure surveys to locate, manage and detail water wells and electrical lines and reference for future growth



## 3.3 Market-based Solutions

### Market-based Overview

Market-based solutions encompass the business and legal aspects of land value, economics, natural resources, market trends and housing. Auroville's current market initiatives revolve around the ability to secure and manage land parcels in the surrounding Green Belt area. Currently, the parcels not under Auroville's purview are subject to market forces that are being driven by Auroville's revitalization of the area and attraction from tourists. This has increased land value in peripheral villages surrounding the Green Belt and has led to real estate speculation from outside developers. This can hinder Auroville's goals of managing growth within the Green Belt and meeting goals within the Green Belt Development Plan (2011). Accounting for Auroville's governance structure and current resources, the strategies outlined in the following subsection provide possible solutions for securing and managing Green Belt lands.



### Land Exchange

A land exchange transaction occurs when two parties exchange land of equivalent value and quality. The transaction does not involve an exchange of funds but rather trade in estate holdings; neither party is required to possess a significant amount of capital to participate. Land exchange transactions may occur across the public-private sectors.

#### Current Practices

Several interviewees indicated that land exchange is one of three common methods Auroville uses to obtain land in the Green Belt. Auroville planners noted that this type of real estate transaction occurs typically with parties who have economic flexibility and are looking for a long-term investment. The Auroville Foundation owns approximately 3,000 acres of land, 1,000 of which is in the town centre, another 1,000 in the Auroville Green Belt, and the final portion located outside of the Green Belt, closer to the ocean. Auroville lands owned outside of the town and Green Belt are exchanged for lands within the Green Belt that are of similar value and quality. The official transfer of land is legally recorded on title and is a way for Auroville to gain outright ownership of lands within the Green Belt. This is considered by many in Auroville to be a “win-win” situation. Auroville planners have indicated that this form of land purchasing has been used mostly in West Auroville in preparation for a wastewater treatment plant and for obtaining lands of agricultural significance. Land exchange transactions help Auroville to maximize their existing assets while obtaining lands within the Green Belt.



## Areas for Improvement

Land exchange has been a useful and successful tool for obtaining outright ownership of lands within the Green Belt. As a non-financial tool for obtaining Green Belt lands, land exchanges should continue to occur where possible. Moving forward, the Land Board and Auroville Foundation should conduct dynamic marketing campaigns to raise awareness of the land exchange option available to current landowners in the Green Belt. This alternative method to purchasing may be attractive to some landowners.

### Next Steps:

- Continue to increase Green Belt land holdings by exchanging land
- Implement dynamic marketing campaigns to increase awareness of this option to private landowners in the Green Belt



## Land Lease

Land leases are a form of rental agreements that permit the tenant to occupy or use a portion of land owned by the landlord in exchange for a rent sum. The lessee pays a sum of money to the landowner to occupy or use the land and holds the land in obligation. Land leasing is used in a variety of different contexts from retail to commercial and agricultural. In India, land leasing is a common tool used in the agricultural industry to ensure all land is being exercised to its full potential.

### Current Practices

Land leasing is a much less commonly used tool in Auroville. Land leasing can be useful in establishing relationships. As it stands, Auroville leases land on an “as-needed” basis from private landowners. Land lots in Auroville tend to be small. Leasing is used in cases such as Tanto’s Restaurant, where Aurovillian businesses need slightly more space than is owned. In this instance, Tanto’s did not have enough space on the Auroville-owned lot and subsequently sits on partially leased land.

Information gathered from the interviews revealed related land use issues. Some interviewees felt that Auroville is underutilizing the lands that they own; the organic farms are not operating at full capacity and arable land is sitting fallow. This creates a negative perception of Auroville in the eyes of villagers, who see the untouched land as inefficient. Auroville planners expressed general interest and support for the potential success of land leases as a way to make use of underutilized land. Auroville planners also indicated that using the lands in sustainable ways might inspire private landowners and villagers to follow. Based on research and fieldwork, Auroville is not currently leasing any of its owned



and unused lands. Because of this lack of use, Auroville is facing encroachment and loss of value to speculators. Encroachments on Auroville lands create conflict and ambiguity with respect to land ownership. One Auroville farming specialist suggested that encroachment issues might be mitigated if Auroville began erecting fences on lands in their possession.

### Areas for Improvement

Auroville is having difficulty establishing and maintaining ownership of lands in the Green Belt. Once land is purchased, it is essential that it is managed with protection and stewardship initiatives. Erecting fencing around recently obtained land might restrict the amount of encroachments occurring.

Land leasing is an option available to Auroville to establish relationships and to help expand the sustainable uses on unused lands. “Peppercorn” leasing helps to establish the landlord-tenant ownership relationships without instigating demanding rents. The landlord charges a minimal fee, such as one rupee, to the tenant. Peppercorn leasing is used where the leasehold interest is long term. Auroville’s Green Belt objectives are long term in nature. The land is held in obligation to the landlord, however, the tenant continues to be able to use the land to his or her preference. Arable farmland located in Auroville not in use may be leased to capable farmers in the area for a nominal fee. Alternatively, Auroville might lease land back to the original landowners once the purchase is complete. This arrangement would establish Auroville as the landowner, maximize the use of available land, develop and help maintain local relationships as well as ensure that Auroville would remain in control of future development options. Demonstrating that the lands are in use or undergoing rehabilitation efforts would be a positive step to reduce encroachment and create a positive image to locals.

### Next Steps:

- Put up fencing on lands owned by Auroville that are currently not used
- Lease lands to former owners, farmers, Green Belt residents using the “peppercorn” leasing strategy



# Development Rights

Development rights are the outright authority to build and alter the land as the title holder sees fit. A transfer of development rights (TDR) program is a market-based technique that encourages the voluntary transfer of growth from places where a community would like to see less development (sending areas) to places a community would like to see more development (receiving areas). Sending areas may be environmentally sensitive properties, open space, agricultural lands, wildlife habitats or historical landmarks. The receiving areas should be places that the general public deems appropriate for additional development.

## Current Practices

Currently, TDRs are not being used in Auroville. Multiple stakeholders have expressed interest in creating policies and working with development rights to help manage Auroville's growth. Conversely, other Auroville resource persons have expressed the mixed effectiveness of TDR implementation and application across India and are skeptical of utilizing TDRs in an Auroville context. On a regional scale, Puducherry state planners are currently in the process of amending their *Town and Country Planning Act* to allow for the use of TDRs. The state government of Tamil Nadu has already amended their *Planning Act* to include TDRs with extensive guidelines. The purchaser of TDRs within Tamil Nadu state is entitled to Floor Space Index in the form of a Development Rights Certificate (DRC), which the purchaser may use or transfer to any other person (Tamil Nadu State Planning Department, 2016).

## Areas for Improvement

While Auroville would not directly benefit from DRCs or allowing increased density within their boundaries, Auroville can benefit from facilitating DRC transactions in a different manner. Auroville can purchase development rights in the form of DRCs from the landowners within the Green Belt, banking DRCs and selling them to Tamil Nadu developers through a public bidding process. The funds retrieved can be reinvested into purchasing more development rights in the Green Belt area. For example, four municipalities within Lancaster County, Pennsylvania, USA have taken active roles in facilitating TDR transactions. The townships purchase farmers' or landowners' development rights by leveraging funds from the Lancaster County Agricultural Preserve Board (Theilacker, n.d.). Utilizing a bigger funding pool enables the municipalities to increase the number of easement transactions than would otherwise be available. The model used in Lancaster County can be replicated with funds from the AVF. However, for TDRs to work in Auroville, contracts need to be upheld by the selling party for illegal land developments to stop.

### Next Steps:

- Facilitate the purchase of TDRs between Green Belt residents and other Tamil Nadu state developers

# Direct Purchase

Direct purchasing transactions occur where a property asset is exchanged for capital. Once title is obtained, all rights to the property access and management belong to the title holder. It is difficult to manage lands without holding title.

## Current Practices

According to Auroville Land Board and planner interviewees, the main method of Green Belt growth management is through direct purchase of lands. The Land Board has purchased approximately 1,200 acres of the available 2,400 acres of land within the Green Belt. The purchasing strategy is also a bottom-up approach where landowners approach Auroville with all the necessary documents once their family has reached consensus to sell. This helps to establish a collaborative rather than coercive relationship with the area surrounding Auroville. In addition, directly approaching villages with the intention of purchasing land may cause landowners to raise their asking price.

Currently, the AVF's fundraising campaigns fund direct purchases. Relationships with *Friends of Auroville* internationally are important to furthering these direct purchase strategies. There is also a few "Special Interest Projects" carried out by the Land Board. These projects conduct fundraising to purchase a specific parcel of land for a purpose. For example, Green Acres is a special interest project where an Aurovilian proposed a sustainable farming project and the AVF then raised funds to purchase suitable land for this purpose.

## Areas for Improvement

Moving forward with the direct purchase strategy, Auroville would benefit from additional special interest projects. These projects provide increased utilization of the land, thus enabling

more meaningful fundraising campaigns and the willingness for local landowners to collaborate. Furthermore, continuation of the fundraising campaigns and expansion of *Friends of Auroville* will help the AVF to reach its one-billion-dollar goal to purchase all the remaining 1,200 acres of Green Belt land. Auroville should also engage in a land data tracking initiative to record all transactions within the Green Belt. Tracking land values through variables such as location relative to Auroville, suitability, and proximity to roads can provide additional data for the Land Board to more accurately estimate land values, emerging patterns, and yearly inflation. Leases can also be tracked to help Auroville understand land use interests and patterns for further leasing of purchased lands.

Finally, Auroville can also benefit from right of first refusal agreements with landowners. Typically, first refusal rights can be included in land leasing contracts where landowners must come to Auroville first before any other party once they have reached a decision to sell. However, in the Auroville context, the Land Board could take a collaborative approach and ask all the landowners within the bioregion to approach Auroville before other parties once there is an intention to sell.

## Next Steps:

- Initiate more "Special Interest Projects" to raise funds to obtain more Green Belt lands for a specific purpose
- Continue other fundraising campaigns and expand *Friends of Auroville*
- Develop a land data tracking initiative
- Establish right of first refusal agreements



# Planning and Design Guidelines

Planning and design guidelines would provide a framework and process for shaping growth and encouraging sustainable building techniques. Design frameworks may include aspects of architecture and physical planning to ensure a common standard is established. These standards would help to promote benefits to the local community and provide ways to safeguard the environment.

## Current Practices

The most common concern revealed throughout the interviews and fieldwork research was unmitigated development. An Auroville planner noted that developers (both local and foreign) within the Auroville area are building without consideration to local form or customs. New buildings tend to stick out. Interviews and focus groups conducted with village resource persons revealed that the local villages are facing a loss of cultural heritage. Many emphasized the importance of a bottom-up approach and the need for meaningful, active consultations with local landowners and residents. The lack of consultation between developers, Auroville and residents has resulted in fragmented and haphazard developments. Meaningful collaborations would use Aurovilian expertise and knowledge to empower local visions.

As it stands, there are no existing regulations with respect to physical design or public infrastructure like transit, roads or water. Developers are building without consideration to local vision or long-term needs. The current developments are short term in vision, as they do not factor in the benefits of sustainability or the long-term effects of loss of cultural heritage. Based on interviews and focus groups, there is no movement towards regulating developers from a physical design perspective.

## Areas for Improvement

Auroville and the surrounding villages would benefit from implementation of planning and design guidelines to ensure appropriate development within the Green Belt. Interviews with Mohanam and the Village Action focus group revealed that envisioning workshops with woman and youth leaders effectively empower the community to shape itself. Combining this vision with the professional pool of knowledge in Auroville can create concrete, practical and professional documents that developers can follow. Working together on these guidelines also presents another opportunity for collaboration between Auroville and Green Belt residents.

Architectural style and physical built form need to be regulated within Green Belt villages so that cultural heritage is preserved. As seen in the Seoul Greenbelt villages case study, disruption of existing stable communities could create a feeling of displacement for the original residents. According to Edinburgh's Guidance for Development in the Countryside and Green Belt (2017), new building design, scale and layout should follow relevant local guidelines. The local greenbelt villages can then be empowered to take responsibility for their own built form and model their community through their own vision of cultural heritage (The City Of Edinburgh Council, 2017).

Auroville can also offer expertise in sustainable building guidelines (Revi, 2007). Resource persons and Auroville planners voiced their concerns regarding sustainable water usage, as well as climate change impacting the bioregion. South Lanarkshire, Scotland has an extensive Green Belt and rural area local development plan that addresses water supply when developing in the Green Belt (South Lanarkshire Community and Enterprise Resources, 2015).

Auroville can offer expertise on sustainability practices, such as solar water heating and green roofs, helping villagers deal with climate change while lowering their utility expenses.

Finally, inclusion of safety practices, standard setbacks, infrastructure requirements, and accessibility standards can improve the livelihood of all residents within these villages. By solidifying these standard practices into local village development plans, the Green Belt villages can develop in an organized manner. Auroville has the resource knowledge to help the villages implement these best practices.

### Next Steps:

- Develop planning and design guidelines in consultation with Green Belt villages to share with developers. Planning and design guidelines to include:
  - Architectural style (vision from locals, emphasis on cultural heritage)
  - Sustainable building guide (water management, passive cooling, etc.)
  - Best practices building code (safety, infrastructure, and accessibility)



*Construction in a Green Belt village (December 3, 2017)*

## 3.4 Environmental Solutions

### Environmental Overview

Greenbelts play an important role in managing growth to protect environmental systems and agricultural land. Conserving environmental systems is essential to addressing issues such as watershed planning and protecting biodiversity and wildlife. Agricultural lands provide a source of livelihood and local food security. The lands within Auroville's Green Belt face challenges regarding both environmental protection and support for viable agricultural land uses. Environmental challenges include depleting water resources, protecting and promoting forest growth, restoring degraded lands, and promoting bio-diversity. Agriculture is a primary land use within the Green Belt and was identified by village leaders in the Village Action Group focus group as a desirable land use within the Green Belt. However, due to a variety of factors, farming has limited viability and is associated with a low economic and social status. Based on interviews and research conducted, the following subsection will identify current and proposed initiatives to address environmental protection and agricultural viability within the Green Belt.



### Data Collection & Mapping for Environmental Planning

Data collection and mapping are important tools for effective environmental planning. Maps can accurately reflect a given region's environmental features, which can improve the decision-making process. Accurate data collection and mapping is paramount to preserving ecosystem functionality and the natural services they offer to the surrounding bioregion. Examples of these services include food and water sources, flood and erosion control, resources for construction, and natural removal of pollutants from the environment. These services provide measurable economic benefits to the surrounding bioregion, as artificial replication of these natural systems may be extremely costly. Thus, maintaining healthy ecosystems may save substantial future financial costs required for artificial replacements of the services naturally provided by healthy ecosystems. To protect the natural services provided by the Auroville bioregion, it is critical to expand knowledge of the existing natural features. Data may be collected on a vast array of features for topics such as watershed protection, protecting and promoting forest growth, identifying which lands are most suitable for different uses, and promoting biodiversity (Revi, 2007).

#### Current Practices

Since its inception, Auroville has amassed a substantial amount of geospatial data describing the environmental features of the bioregion. Mapping this data has allowed for the creation of easily interpreted visual representations of the critical environmental features of the Auroville Green Belt and bioregion. Auroville planners have stated that, thus far, data collection and landscape surveying efforts have been primarily conducted by contractors,



brought in from outside of Auroville. Interview and research findings indicate that Auroville has collected data on numerous environmental features, such as:

- Forested and sensitive areas
- Elevations
- Watersheds
- Surface water bodies (streams and lakes)
- Soil infiltration (permeability)
- Soil types



## Areas for Improvement

Despite the significant amount of work completed to-date, data collection efforts have been sporadic and numerous gaps in knowledge exist that need to be filled. Interviews with Auroville GIS specialists and planners have demonstrated that addressing these gaps in the database are essential for effectively mapping and prioritizing sustainable growth in the Green Belt. For example, to identify prime agricultural lands and prioritize their importance, data must be collected from the bioregion on: past/current land uses, soil quality, and preventing land fragmentation (OMAFRA, 2017). This approach uses a weighted system which places unique value on each input. While this method was designed in Canada, it could be adapted to Auroville's context by slightly altering the input data, or by changing the data weighting based on which features are most important in the local context. By expanding Auroville's database of geospatial information on the bioregion, more complex understandings of the functioning of the ecosystem may be gathered. Research and interviews with Auroville planners has resulted in the identification of the following three critical gaps in environmental geospatial data: (1) soil quality, (2) improved contour data, and (3) biodiversity.

## Next Steps:

- Fill gaps in geospatial data by collecting data on essential environmental features
- Develop a weighted mapping system, which incorporates a variety of inputs to determine the value of lands for a given purpose. For example, identifying prime agricultural lands

# Rural Development Programs

Auroville owns approximately 25 per cent of land within the Green Belt, therefore the majority is privately owned (Auroville, 2011). The nature of land tenure is divided, making it essential for the AVF to act as a leader in environmental protection and sustainability in the Green Belt. To accomplish this, Auroville planners stated that Auroville must lead by example, demonstrating the benefits of sustainable agriculture and responsible rural development on their own lands while simultaneously developing collaborative partnerships with the surrounding villages and local farmers. It is important for the AVF to explore these opportunities through continuing sustainable forms of agriculture, building practices, and renewable energy. The Green Belt plays a critical role in providing a buffer to protect sensitive environmental areas as well as the local watershed. As the primary land use within the Green Belt, supported by the Green Belt Development Plan (2011), agriculture also provides critical sources of food and income for Aurovilians and village residents alike. However, it is important to ensure that agriculture is done sustainably, as it is an intensive form of land use that has the potential to strain the watershed, disrupt natural ecosystems, and cause land degradation. By promoting sustainable practices, Auroville can make significant strides towards solutions to environmental issues found throughout the bioregion (Revi, 2007).

## Current Practices

Within Auroville, there are numerous active programs and activities which promote environmental sustainability. Agriculture is a primary land use in the Green Belt Development Plan (2011) and has a significant impact on the bioregion's sustainability and health. To promote sustainable farming practices, Auroville is engaged extensively in organic farming initiatives. In 2011, Auroville developed the Auroville Sustainable Agriculture Plan (ASAP), a five-year plan that includes all the individuals and groups involved in the growth, collection, distribution, and processing

of local produce. ASAP provides a shared organizational structure and overarching vision for sustainable agriculture in Auroville. By continually researching and experimenting with ecological agricultural practices, Auroville contributes positively to environmental sustainability by creating self-sufficient food sources, sustaining land fertility and ecological diversity, restoring degraded land, and promoting water conservation in farming practices. To support these ecological farming efforts, a system known as *Food Link* has been established which acts as a collection and distribution program for organic produce grown on Auroville farms. *Food Link* connects the farms to the community, linking local food producers to local restaurants, kitchens, schools, food processors, and residents. Complementing its active farming efforts, Auroville also offers numerous training programs in ecological agriculture.

In addition to sustainable agricultural practices, Auroville is heavily engaged in innovative and sustainable development practices. For example, reliable energy self-sufficiency has been achieved through the generation of renewable energy. This renewable energy is generated from sources such as solar, wind, bio-gas, and thermal. These innovative efforts have helped to further Auroville's goal of being a self-sustaining community, continually experimenting with new systems and technologies aimed at improving on existing renewable energy solutions. Additionally, Auroville has experimented with the use of sustainable building practices that emphasize the integration of physical and social structures with the environment. Lessons learned in Auroville provide an invaluable source of information from which other communities around the world may learn and follow.

## Areas for Improvement

Within Auroville, there is a demand for organic agriculture, but organic agriculture practices could be improved to be more sustainable. The local climate, soil and topography do not provide ideal growing conditions for all vegetables. Auroville is self-identified as an international township and, as a result, residents and visitors enjoy international dishes and produce that generates demand for non-indigenous crops, such as carrots and tomatoes. Furthermore, these crops can be more labour and resource intensive. To address this, Auroville farms, residents and eateries should work towards promoting cuisine made with crops suited for the local growing conditions. This could be achieved by creating custom international dishes at local eateries that use indigenous crops. This would acclimate Aurovilians to local foods and demonstrate the diverse ways they can be incorporated into familiar meals. Additionally, the distribution and dissemination of similar recipes would contribute to developing a stronger market for crops that are suited to the local climate. To address the demand for non-indigenous produce, efforts should be made to establish trade partnerships with domestic and international sustainable and organic farms. This would allow Auroville to satisfy demand for non-indigenous produce while ensuring farming practices are efficient and environmentally sensible. The promotion of indigenous crops will improve sustainability, encourage self-reliance and work towards creating a viable market place.

### Next Steps:

- Explore opportunities to combine indigenous crops with international cuisines
- Encourage local eateries to promote these recipes
- Make these recipes available to the public
- Establish trade partnerships to source non-indigenous organic produce

## Partnerships with Villages

The Green Belt lands are situated around existing villages and most of the Green Belt lands are privately owned. The Green Belt provides an essential buffer to protect sensitive environmental areas as well as the local watershed. Agriculture is the primary land use within the Green Belt. It is a source of livelihood and is supported by the 2011 Green Belt Development Plan. Therefore, to ensure protection of sensitive environmental Green Belt lands and support the viability of agriculture, collaboration and partnership with the surrounding villages is essential.

### Current Practices

Currently, Auroville supports a variety of village partnerships to address local conservation, water management, and agricultural practices. Mohanam is an organization, located in the Village of Alankuppam, working to educate youth and community members on the importance and history of local natural heritage. This is exemplified by a community workshop held by Mohanam to encourage women and youth to create a vision for the future of their local lake. Additionally, Auroville farms host educational sessions on sustainable and ecological farming research with regional farmers.

### Areas for Improvement

There is an opportunity for Auroville to increase partnership initiatives with the surrounding Green Belt villages to improve environmental conservation and improve agricultural viability for village farmers. Firstly, a common theme in our interviews was the need to recognize the importance of traditional village planning practices. Continuing and expanding two-way educational initiatives, such as those being facilitated by Mohanam, will play an important role in ensuring residents and Auroville have a strong understanding of local cultural and natural heritage. This will empower residents with the knowledge and understanding to initiate and support



future environmental protection programs. It will also allow them to deepen their understanding of traditional planning practices. Additionally, Auroville can partner with villages to support Green Belt farmers and improve land viability. Our research indicated that local farming practice is labour and water resource intensive, primarily small scale, and associated with low economic and social status. Auroville farms also struggle with viability and some offset their expenses by conducting research, providing educational sessions and hosting volunteers. This highlights the potential for village farmers to improve their farm's viability by participating in on-farm diversified uses. Consultation and a feasibility study could be conducted in partnership with villages to assess the potential for on-farm diversified uses. Additionally, there is a lack of a consistent communication point between villagers and Auroville. Therefore, the creation of a meeting place or forum for village farmers would improve the dissemination of information and allow for knowledge sharing. This would allow farmers to share relevant agricultural knowledge and news with one another. This would also create a consistent communication line between Green Belt farmers and Auroville.

The Auroville Farm Group and *Food Link* place an emphasis on sustainable and organic farming practices. However, it takes five years to become a certified organic farm. With little to no market for organic foods outside of Auroville, farmers do not receive fair compensation for the increased labour and inputs of organic farming. For farmers who are already faced with slim profit margins, it is not a realistic option. However, sustainable approaches, such as responsible land management and reduced inputs of fertilizers, pesticides and water, can have both positive environmental and economical benefits. Therefore, programming initiatives building from Auroville's vast knowledge on sustainable farming and based on the farmer's self-identified needs could be facilitated.

### Next Steps:

- Continue to develop environmental education programming in collaboration with Green Belt villages
- Consult with village farmers to conduct a feasibility study on on-farm diversified uses
- Work with Green Belt residents to establish a forum to allow for collaboration among farmers
- Develop agricultural education and training based on farmers self-identified needs



Pondicherry Farmers' Market (December 10, 2017)

## 3.5 Social Solutions

### Social Overview

Understanding and building social relationships between Auroville, Green Belt residents, and external bodies is necessary to the creation of a supportive and transparent planning process. Practices provide opportunities for Aurovilians and Green Belt residents to share their comments on the management of lands will provide a more inclusive and informed decision-making process.



*Community visioning workshop in Alankuppam (December 9, 2017).*

### Collaboration Hub

It is important for Auroville to work closely with the Green Belt villages when planning future growth because growth management efforts may be lost if they do not acknowledge or account for village growth in the region as well. Therefore, strengthening relationships and improving communication with local villages will be an essential component of any future growth plans. Through interviews, village resource persons stated they would support an initiative to provide a space that connects practitioners with villagers to increase opportunities for discussion, education and integration.

#### Current Practices

Interviewees, including Auroville planners, village residents, and state planners from Puducherry, all have an interest and stake in planning the Auroville Green Belt. As multiple bodies have jurisdiction over the Green Belt, it will be important to build networks involving these parties. This will allow for the development of stronger regional plans. Current relations at the state level are not well identified, as was discovered in the interview with state planners from Puducherry. The relations with the State of Tamil Nadu, however, are more developed, with various partnerships from state-sponsored groups, such as the Sustainable Livelihood Institute. Furthering these relationships and opening channels of communication is vital to the future of regional planning around Auroville.

Moreover, the Mohanam organization and the Village Development Committees create opportunities for local voices to be heard in Auroville. Village leaders stated that Auroville organizes a lot of educational initiatives, however, some barriers



persist. While efforts to build relationships between Auroville and the villages are happening, there is still room for improved engagement strategies. Some programs, such as those run by Sustainable Livelihood institute, have emphasized the importance of ongoing and consistent contact and communication, which village resource persons identified as significant to strengthening relationships in the region.

Aurovilians have connections and networks that can be leveraged to create more inclusive and unified planning decisions. Advancing these connections through increased consultation and communication with the villagers can bridge any communication gaps that remain. Strengthening the relationship is a time sensitive matter, as the villages are growing rapidly. Therefore, working with them to manage this growth in a productive way under a common vision is vital to the future of the region.



*Project team interviews Mohanam (December 5, 2017).*

## Areas for Improvement

As a leading body in the region, Auroville should be setting an example for communication and relationship building. A Collaboration Hub can provide an inclusive place that both Auroville and the surrounding populations can utilize as a forum for discussion. This could improve overall information dissemination and strengthen relationships. The purpose of this Collaboration Hub would be to provide a central location for the surrounding populations to seek information and improve access to resources offered by Auroville and vice versa. Having a space that promotes collective shared knowledge will increase levels of interaction and strengthen relationships between Auroville and the Green Belt villages.

Moreover, a major takeaway from interview findings was the desire for a bottom-up approach that puts the focus on the villages when planning within Auroville's Green Belt. The case study of Sao Paulo's Green Belt Biosphere Reserve provides valuable evidence that bottom-up planning can work among many different autonomous municipalities. The Green Belt residents and local organizations worked together to petition UNESCO for the creation of the Green Belt Biosphere Reserve. These groups now work collaboratively to protect it, as it is not recognized by the federal government. In the context of Auroville, the Collaboration Hub would provide a location to facilitate and encourage communication with the villagers on the work that is being done in Auroville, so that any plan that includes village lands also includes villagers' input and insights. Both village and Auroville resource persons suggested that if Auroville carries out activities that are recognized as good and economically viable by the villagers, they will see greater value in cooperating with Auroville.



Both Auroville and village resource persons expressed that there was “... a lot of talk, but very little action,” and that committees were often created within Auroville that did not follow through on their initial initiatives. Improving communication and building stronger relationships through the Collaboration Hub would lead to stronger engagement and, subsequently, community retention and support. Referring to the Wellington, New Zealand case study, interaction between landowners, citizens and tourists through education and advocacy programs led to an increased awareness of the Green Belt and reduced barriers of communication.

### Next Steps:

- Identify key community stakeholders and decision makers and maintain those relationships through continuous outreach and contact
- Provide a forum for discussion between Auroville and the Green Belt villages through the establishment of a Collaboration Hub



*Community outreach event in Green Belt village (December 3, 2017).*

## Activity Impact Assessment

To measure the success of activities offered by Auroville’s existing village outreach initiatives, it is recommended that an activity impact assessment be completed. This assessment is a means of measuring the effectiveness of organizational activities and the significance of changes brought about by those activities (Impact Assessment, n.d.). Conducting an activity impact assessment will help Auroville determine if the activities carried out in the villages are producing the changes they set out to accomplish. Furthermore, it will allow Auroville to learn from and improve these activities. It will also show whether programs are making a difference to the residents. The goal of an impact assessment is to bring about a more socio-culturally, economically sustainable and equitable environment by promoting community development and empowerment (Vanclay, 2003).

### Current Practices

Auroville carries out numerous activities and has helped with the implementation of various village programs including road development, solar power generation, solid waste management, income generation projects for women and construction of individual household toilets. There are also several initiatives led by the Auroville Village Action Group and the Town Development Council, such as the Village Development Committees, a liaison between villages and Auroville planning.

Activities that Auroville carries out have an impact on the local villagers (Revi, 2007). There is a wide range of groups in Auroville who are doing a great deal to help the villages. For example, “Bridging the Gap” is a program that aims to bridge the socio-economic gap created by poverty, gender, language, and caste through sports activities. Similarly, Mohanam works as a liaison between Auroville and its surrounding villages, placing an emphasis on local cultural heritage and traditions by empowering the local villagers.

## Areas for Improvement

After speaking with numerous village residents, including village leaders, the women's group, a panchayat member, and residents, as well as Auroville planners, many different perspectives emerged on the effectiveness of the engagement activities implemented within the villages. Auroville planners stated the Green Belt villages are becoming increasingly dependent on Auroville's resources and economy, which has caused a shift in integration initiatives with village residents. Instead of providing forms of charity, Auroville is working with the villagers to provide skills training, which is seen as a more self-sustaining long-term approach. It was noted by previous studies in Auroville that having evidence of how Auroville has helped villages can be used to draw the state and federal government to help invest development resources in the villages and in the people. It is therefore recommended that an activity impact assessment be conducted because it is a way of showing the impact Auroville is having and addressing which needs are currently not being met.

An activity impact assessment should be completed for each activity or program that Auroville is conducting in the villages. The data gathered from each impact assessment should be analyzed and compared to one another to identify areas for improvement. The activity impact assessment should be completed by all parties involved in the specific activity. The perspective of the village residents is especially critical, since they are the recipients of the programming. It is also necessary to identify any gaps between what Auroville believes is being accomplished and what should be done to further work with the villages and strengthen relationships. After completing the assessment, it is important to learn from and improve program activities and apply the lessons learned in a practical manner.

## Next Steps:

- Conduct an activity impact assessment for all current programming in the Green Belt village settlements
- Analyze findings from each assessment
- Develop methods to improve activities, as needed
- Create a document on lessons learned to identify how, and in what ways, Auroville is impacting the villages and if they are successful



*Project team visits Mohanam community center (December 5, 2017).*



# Community Asset Assessment

A community asset assessment examines a community based on the skills and strengths of the whole community. It is used to identify assets and resources that can improve economic development. It determines assets that are driven by the community itself, and not by external agencies (Mathie, 2002). These assets may include not only the skills and strengths of a community, but also personal relationships and networks (Mathie, 2002). Auroville's resources can be useful in assisting the villages in uncovering their asset potential and in building long-term, financially viable growth.

## Current Practices

The shift towards asset based development is already being considered by groups within Auroville, as it has been identified that providing "handouts" to the villages based on need does not work to solve the issues at hand. Instead, working to provide the villages with the skills necessary to grow more autonomously will provide the community with opportunities for more sustainable and long-term change.

## Areas for Improvement

Based on the research conducted, it is recommended that a community asset assessment be completed to understand the skills and strengths of each of the Green Belt villages. This will serve two purposes. First, it will assist Auroville in identifying areas to focus assistance in the villages through ongoing programming. Second, it will empower the villages to take action on their own development by focusing on the strengths of the community and understanding how they can further provide for sustainable development (ABCD, n.d.). The fieldwork conducted by the project team revealed that there are many assets within the Green Belt villages already, including cultural heritage and traditional agricultural practices. Through a more thorough assessment, additional assets and means of asset improvement may be identified.

The assessment will be most useful if conducted by villagers as a form of bottom-up planning. However, based on the importance of the outcome of this assessment to the development of Auroville's Growth Management Strategy, there is an opportunity for Auroville or associated groups to facilitate the discussion.

Creating and conducting the assessment is only the first part of the process. It would also involve identifying local leaders within each of the villages to follow through and take action once the assets are identified. Additionally, in order for Auroville to provide support on the identified assets, internal Auroville resource persons should be identified based on the results of the community asset assessments. They will be the main point of contact for the local leaders and will assist in establishing other connections. The importance of the local leaders and Auroville resource persons cannot be stressed enough, as many interviewees identified that the issue with existing initiatives spearheaded by Auroville is that the villages often do not know who to contact.





## Next Steps:

- Work with village local leaders to format a community asset assessment to capture the unique skills and strengths each community has to offer
- Conduct community asset assessments in all villages within the Auroville Green Belt area
- Conduct a workshop to build a community vision and plan for each village based on identified assets (Kretzmann and McKnight, 1993)
- Identify areas where Auroville skills training or programming can be utilized to assist villages



*Handicrafts for sale in a Green Belt village (December 8, 2017).*

## 3.6 Conclusion

The four subsections above (Land Use, Market-based, Environmental, and Social) provide possible solutions intended to guide the overall management of the Green Belt lands. It is critical that the proposed solutions presented be evaluated from both the perspective of Auroville and Green Belt residents before they are fully implemented. Auroville should seek to gain enough information to effectively evaluate the proposed solutions from the perspective of Green Belt residents in the imminent future.



*Village Action focus group (December 5, 2017).*

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# chapter 4

## FRAMEWORK

## IMPLEMENTATION



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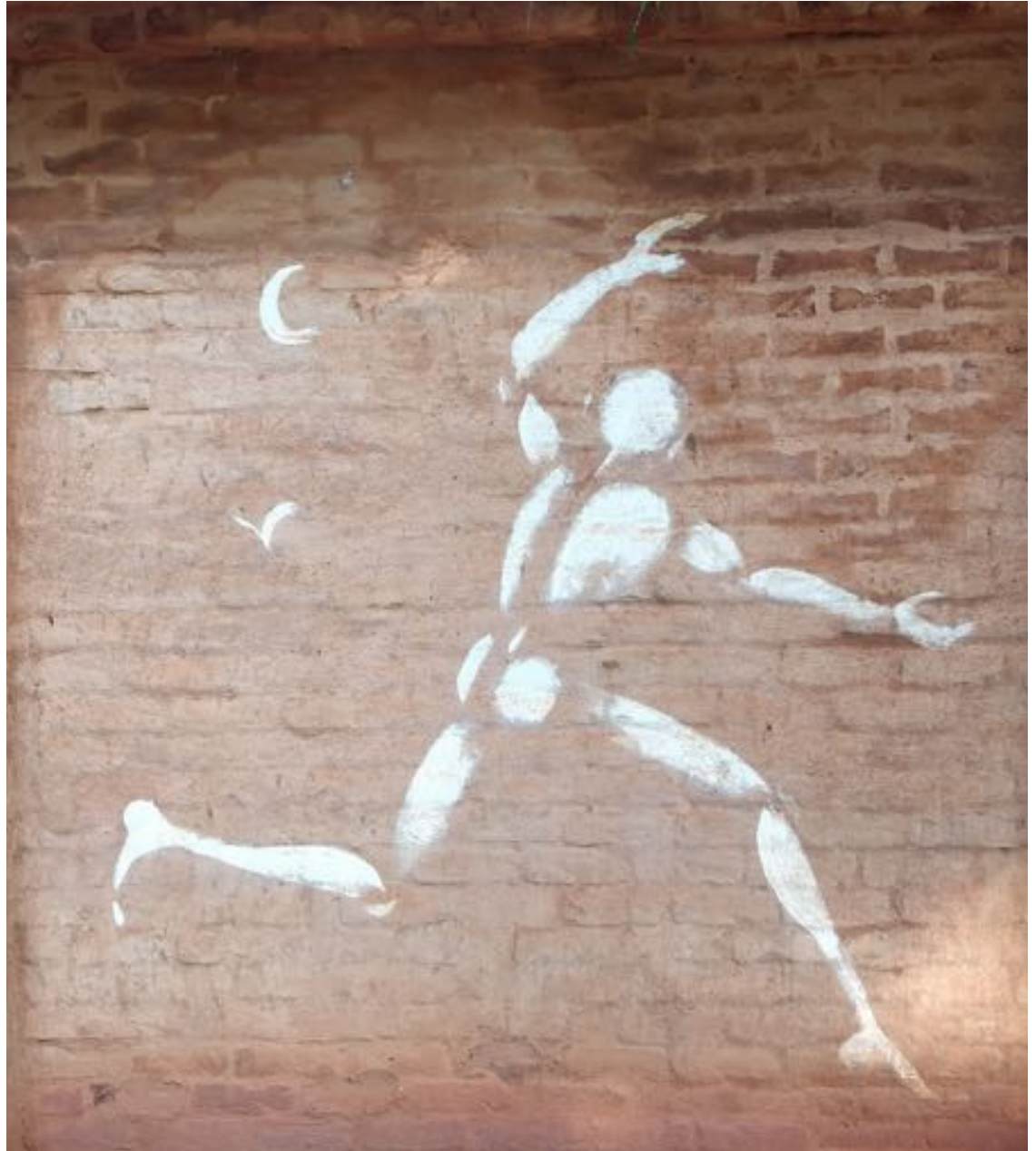
Conclusion

## 4.1 Introduction

To create the final Growth Management Strategy for the Auroville Green Belt region, a series of solutions have been recommended through this Framework model. The importance of the Growth Management Strategy to the future of both Auroville and the surrounding villages cannot be understated. Further action and research needs to be undertaken in a timely manner for the region to grow holistically and to its full potential. Since there are multiple stakeholders with a vested interest in the future of the region, fostering open communication channels throughout the entirety of the implementation process is essential.

It was noted by numerous Auroville planning experts that the timeframe for creating and implementing the Growth Management Strategy must be within the next five to seven years, or by 2025 at the latest. They noted that the villages are growing at a much faster rate compared to Auroville. Beyond the 2025 benchmark, management of growth in the Green Belt may become more difficult for Auroville to address because of disproportionate rates of growth within the region.

The following section outlines additional tools that could be used to implement the eventual Growth Management Strategy, as well as a detailed suggested timeline for initiating the proposed solutions within Auroville. When put together, these implementation tools and solutions will provide a strong basis for the creation of a regional Growth Management Strategy for the Auroville Green Belt.





## 4.2 Tools for Implementation

### Ratification of the Green Belt Development Plan

To strengthen the Auroville Growth Management Strategy in its eventual implementation, the 2011 Green Belt Development Plan should be ratified by the state government of Tamil Nadu and the Union Territory of Puducherry. This would create a collective governmental understanding of the importance of the Auroville Green Belt and create an added layer of protection over it. Ratification is necessary to legitimizing the Green Belt's land uses with other Green Belt users. This ratification would provide state government support to Auroville's growth objectives, allow land use laws and policies to be created, and allow for the enforcement of these policies.

The ratification process would require the Tamil Nadu and Puducherry government bodies to designate land use for the Green Belt according to their existing land use definitions. Further, all three bodies (Auroville Foundation, Puducherry Union Territory and Tamil Nadu) should work cooperatively to permit only the activities on that land that are sustainable and offer benefits to all users. State ratification would increase the power that the Auroville Foundation and the Town Development Council has in preserving the Green Belt lands that are currently not under Auroville's ownership.

Through land use designations at the state level, an approval process and request for change of land use would need to be submitted for new developments on state lands, thus creating another limitation for developers in the Green Belt. Furthermore, this ratification would enhance Auroville's relationships with the state governments and develop a collective responsibility within the Green Belt. An international example of how legal ratification can assist land in management is found in Ontario's Greater Golden Horseshoe Greenbelt in Canada, which has a strict provincial legal framework that enforces the land uses and controls development through the Greenbelt region (MMA, 2017).



## Signage

Signage can be a useful tool for raising awareness of the Auroville Green Belt to Aurovilians, village residents, and other landowners within the Green Belt. Establishing signs throughout the existing Green Belt would help to demarcate Auroville's land and provide a visual aid for locating Green Belt boundaries. These signs should be positioned in areas of high visibility, such as along roadsides, to signal when people are entering the Green Belt. In addition, more detailed informational signage should be used to signify the important cultural and natural heritage features within the Green Belt lands. This will provide information, education and context to residents and visitors regarding the significance of protecting and preserving the Green Belt lands. Creating Green Belt signage also offers Auroville another opportunity to collaborate with the Green Belt villages. This collaboration would generate a collective knowledge base on the features in the Green Belt that should be protected as well as areas of cultural and historic interest. It can also foster inclusion in decision-making and highlight the Green Belt's significance for many different users. Signs have been used to highlight greenbelts worldwide, such as in Ontario, Canada and Wellington, New Zealand. While implementing informative signage is not a new practice, it is a useful one in raising awareness.





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## Green Belt Communication Directory

While conducting interviews and focus groups, it became quite apparent that effective communication is often hindered by a lack of clarity on who the contact persons for certain initiatives or programs are. It was heard from village resource persons that this lack of clarity is often problematic, as there is difficulty identifying who to go to for different initiatives, such as starting a discussion on a Green Belt related matter, creating a new Green Belt partnership, or inquiring about an existing initiative operating within a village. As such, the creation of a directory of individuals and organizations who are important to creating and maintaining the eventual Auroville Growth Management Strategy is essential. This directory would work with the recommended Collaboration Hub to provide both Aurovilians and villagers with knowledge of key contacts when issues or questions arise about Green Belt related initiatives. The directory would be a living document, subject to revision if individuals or parts of the Strategy change. However, the basis would ensure that communication lines remain open. It is important to remember that the Auroville Growth Management Strategy is not being implemented in isolation and, therefore, ensuring open communication networks is necessary for its success.

## Developing an Assessment Toolkit

After the proposed solutions are completed and the Growth Management Strategy is developed, it is recommended that an assessment toolkit be created to ensure Auroville can evaluate and further refine the Growth Management Strategy, when needed. Assessing the Growth Management Strategy will allow any issues to be addressed and provide an opportunity for it to adapt to changes over time in the Green Belt. To assess the Strategy, a series of goals should be developed. These can be broken down into subcategories based on central themes (land use, market, environmental, and social). To ensure the effectiveness of the assessment, goals should be specific, measurable, achievable, realistic and timely (abbreviated as SMART) (Chamberlin, 2011). This will allow for the Strategy's progress and success to be measured over time and play an important role in refining the Strategy's implementation.



## 4.3 Implementation Timeline

In the adjacent table, a five-year timeline has been outlined to further break down the four themes and subsequent solutions. This timeline serves as a guideline for when the recommended solutions should be initiated to achieve the most effective outcome and complete the development of the Growth Management Strategy within the outlined time (5-7 years). Despite the project team's best efforts to be mindful of differing visions in the creation of this Growth Management Framework, certain solutions may not entirely align with both Auroville or Green Belt residents' visions for the future. Therefore, the first step in this timeline would be the evaluation of the Growth Management Framework from both the perspective of Auroville and that of the surrounding village populations. These evaluations must occur in order to move forward with the proposed solutions. The evaluation process from the Green Belt residents' perspective should attempt to include as many different Green Belt users as possible, including local residents and external landowners.

As mentioned previously, the need for these solutions to be completed by 2025 is paramount, as growth pressures will have a significant impact after this time, making it much more difficult for Auroville to manage. To establish other solutions outlined in this framework, there are some that need to be started as soon as the evaluation is completed. This includes the creation of the Collaboration Hub, which will serve as a resource centre for various initiatives and partnerships with the villages.

While there is no specific deadline assigned to each of the solutions, it is recommended that all solutions be initiated sometime in the next three years and completed within the next four years. Some solutions are dependent on access to certain resources and the time to obtain these resources may take more or less time than the team could foresee. Ongoing efforts of relationship building

and communication recommended for Auroville and the villages should occur throughout the Strategy's creation, implementation and maintenance.

After the recommended solutions for Year 4 are completed, the research and input necessary for creating the Growth Management Strategy will be gathered. The recommended assessment toolkit should be created in Year 5, in conjunction with the creation of the Strategy's goals. These goals can be broken into measurable objectives, which can then be assessed. These objectives can be used to measure the Strategy's success and be adjusted as objectives and goals are met. It is important to note that the achievement of a goal and its maintenance are two different things, and this distinction must be considered at the assessment stage. Many aspects will involve continuous monitoring to ensure goals are still being met over time.



*Dr. Agarwal providing instruction to the project team (December 13, 2017)*

## Implementation Timeline

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Framework Evaluation</b>	Evaluation from: <ul style="list-style-type: none"> <li>Perspective of Auroville</li> <li>Perspective of Green Belt Residents</li> </ul>				
<b>Land Use Solutions</b>	Data Collection & Mapping  Infrastructure Surveys	Water Carrying Capacity Analysis  Population Projections	Tourism Studies	Completion of All Solutions in the Growth Management Framework	
<b>Market-based Solutions</b>	Land Leasing	Direct Purchase  Development Rights  Land Exchange	Planning and Design Guidelines		
<b>Environmental Solutions</b>	Data Collection & Mapping  Partnerships with Villages	Rural Development Programs			
<b>Social Solutions</b>	Collaboration Hub  Activity Impact Assessment	Community Asset Assessment			
<b>Implementation Tools</b>	Ratification of the Green Belt Development Plan (2011)	Green Belt Signage	Green Belt Communication Directory		Growth Management Strategy Development  Assessment Toolkit Development

## 4.4 Conclusion:

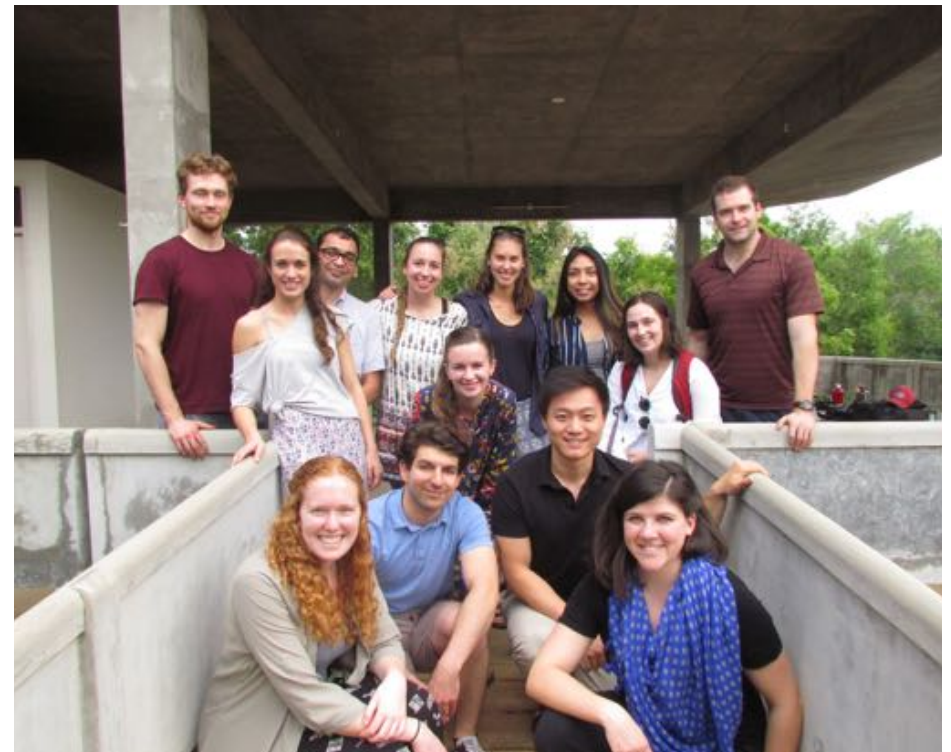
Growth management in greenbelts can be successful in a variety of different social, political and geographical settings. Four months of intensive research and data collection yielded as many questions as answers. The stakeholder opinions and perceptions collected were diverse, but helped to contextualize Auroville's unique position within the region. Frequently occurring opinions emphasized the need for improved communication, collaboration and knowledge sharing across all Green Belt users. A bottom-up approach is necessary to ensure that the perspectives of Green Belt residents are captured and incorporated into the future planning of the region. The unique sociopolitical setting in Auroville requires a distinct approach. Balancing local residents' basic needs with the environmental aims of Auroville presents a clear challenge. This report provides a Framework to inform a Growth Management Strategy to manage growth pressures in Auroville's Green Belt.

It is important to acknowledge the limitations encountered throughout the research and data collection process. Perhaps the most substantial limitation was the language barrier. The project team was not able to interview some stakeholders due to the difference in language and thus these perspectives are not represented in this report. Furthermore, other situations where translators and interpreters were used present additional language limitations, as these translators may or may not have presented the information the same way the original speaker intended.

With only two weeks to conduct this research on the ground in Auroville, there were time constraints. Evaluating the solutions outlined in the report against the perspectives of Auroville and the region was unachievable in the time allotted. Moreover, an even more in-depth study may have revealed other perspectives not captured in this report. Other limitations included a broad project scope, locational difficulties associated with international

projects, and cultural differences. Finally, all of the interviews were conducted on a voluntary basis and do not necessarily capture the views of all stakeholders.

The creation of a Growth Management Strategy for the Auroville Green Belt is essential to Auroville's eternal pursuit of knowledge and human unity, as well as the future of the bioregion. Completion of the land use, market-based, environmental, and social solutions identified by this Growth Management Framework, as well as the tools for implementation, will provide a solid foundation on which to develop and implement a Growth Management Strategy by 2025.



*Project team after completing final presentation in Auroville (December 15, 2017)*



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# Appendix

## APPENDICES



A1

Interview Guides

B1

Complete Solutions Checklist



# A - Interview Guides

## State Planning Representatives

### Introduction

1. Can you tell us about your roles as state planners in Puducherry?
2. What are some of the issues and challenges with the implementation of planning decisions?

### Planning Relationship with Auroville and Villages

1. What kind of planning relationship do you have with Auroville?
2. What is the long-term vision for Alankuppam?
3. Are there currently any infrastructure projects being implemented in Alankuppam?
4. What is the anticipated population growth of Alankuppam?
5. How familiar are you with Auroville's Master Plan and Green Belt Plan?
6. Are you aware of transfer of development rights? Would it be practical to implement?

### Conclusion

1. Other questions/comments.

## Land Board Representatives

### Introduction

1. Can you tell us about your role with the Land Board?
2. How do you see the villages fitting into the Green Belt in terms of future growth?

### Land Use and Development

1. What challenges does the Land Board face acquiring land in the Green Belt?
  - What other methods have you thought of to acquire, purchase, or manage the land?
2. What strategies are Auroville currently using to protect Green Belt lands?
3. What is drawing developers to the land in the Green Belt?
4. Is there a lot of competition for land in the Green Belt?
5. Are developers aware of Auroville's Master Plan and the Green Belt Plan?
6. How do developers interact with Auroville residents, planning bodies, & authorities?
7. Does data or information on land values within the Green Belt exist?

### Conclusion

1. Other questions/comments.

# Village Resource Persons

## Introduction

1. Can you tell us about your role/the role of your organization in working with the Green Belt villages?

## Understanding Village Development

1. When looking to the future, how do you see the villages growing?
2. What are the main occupations/skills that the village residents have?

## Villages and Green Belt Development

1. How does the Green Belt impact the villagers?
2. What is your biggest priority and challenge when supporting the villagers within the Green Belt?
3. What unique challenges to sustainability have you identified for this region and the villages surrounding Auroville?
4. How do you see the villages fitting into the Green Belt in terms of future growth?

## Village Relationships with Auroville

1. How do the Green Belt villages currently work with Auroville?
2. How is information communicated between Auroville and your village/organization?
3. Can you tell us more about the work your organization does in the villages in Auroville's Green Belt?

## Conclusion

1. Other questions/comments.

# Auroville Planners

## Introduction

1. Can you tell us more about your role as a Planner in Auroville?

## Land Use and Development

1. In your opinion, what is the objective of planning for a Green Belt around Auroville?
  - What is your biggest priority when planning for the Green Belt?
  - What is the biggest challenge when planning for the Green Belt?
2. What type of development is happening in the Green Belt and where?
3. How do you monitor development in the Green Belt?
  - What kind of law enforcement is there for development? How could it be improved?

## Communication with Surrounding Communities

1. How do you work with villages in the Green Belt?
2. How does Auroville communicate with the villages on planning related matters?
3. How do you see the villages fitting into the Green Belt in terms of future growth?
4. What efforts do you see as most effective to protect the Auroville Green Belt?

## Conclusion

1. Other questions/comments.



# B - Complete Solutions Checklist

## LAND USE SOLUTIONS

- Prioritize resources to include the land surveying of missing land data needed to map demographics and infrastructure
- Establish a data checklist to properly inventory and catalogue existing maps and determine where more data needs to be collected
- Establish a record of sales and transfers of land within Auroville Green Belt area
- Complete water, land, employment and housing surveys to better inform strategies on resource availability
- Conduct a carrying capacity analysis to highlight what resources are available to Auroville and the surrounding villages to determine where resource prioritization is needed
- Conduct tourism studies to understand tourist impacts on infrastructure sustainability
- Prepare a water carrying capacity analysis to interpret data on water recharge rate and regional water availability
- Complete infrastructure surveys to locate, manage and detail water wells and electrical lines

## MARKET-BASED SOLUTIONS

- Continue to increase Green Belt land holdings by exchanging land
- Implement dynamic marketing campaigns to increase awareness of this option to private landowners in the Green Belt
- Put up fencing on lands owned by Auroville that are currently not used
- Lease lands to former owners, farmers, and Green Belt residents using the "peppercorn" leasing strategy
- Facilitate the purchase of TDRs between Green Belt residents and other Tamil Nadu state developers
- Initiate more "Special Interest Projects" to raise funds to obtain more Green Belt lands for a specific purpose
- Continue other fundraising campaigns and expand *Friends of Auroville*
- Develop a land data tracking initiative
- Establish right of first refusal agreements

- Develop planning and design guidelines in consultation with Green Belt villages to share with developers. Planning and design guidelines to include:

- Architectural style (vision from locals, emphasis on cultural heritage)
- Sustainable building guide (water management, passive cooling, etc.)
- Best practices building code (safety, infrastructure, and accessibility)

## ENVIRONMENTAL SOLUTIONS

- Fill gaps in geospatial data by collecting data on essential environmental features
- Develop a weighted mapping system, which incorporates a variety of inputs to determine the value of lands for a given purpose. For example, identifying prime agricultural lands
- Explore opportunities to combine indigenous crops with international cuisines
- Encourage local eateries to promote these recipes
- Make these recipes available to the public
- Establish trade partnerships to source non-indigenous organic produce
- Continue to develop environmental education programming in collaboration with Green Belt villages
- Consult with village farmers to conduct a feasibility study on on-farm diversified uses

- Work with Green Belt residents to establish a forum to allow for collaboration among farmers
- Develop agricultural education and training based on farmers self-identified needs

## SOCIAL SOLUTIONS

- Identify key community stakeholders and decision makers and maintain those relationships through continuous outreach and contact
- Provide a forum for discussion between Auroville and the Green Belt villages through the establishment of a Collaboration Hub
- Conduct an activity impact assessment for all current programming in the Green Belt village settlements
- Analyze findings from each assessment
- Develop methods to improve activities, as needed
- Create a document on lessons learned to identify how, and in what ways, Auroville is impacting the villages and if they are successful
- Work with village local leaders to format a community asset assessment to capture the unique skills and strengths each community has to offer
- Conduct community asset assessments in all villages within the Auroville Green Belt area
- Conduct a workshop to build a community vision and plan for each village based on identified assets (Kretzmann and McKnight, 1993)

- 
- Identify areas where Auroville skills training or programming can be utilized to assist villages

## IMPLEMENTATION TOOLS

- Evaluate the proposed Growth Management Framework from the perspective of both Auroville and the surrounding village populations to ensure solutions align with various visions for the future
- Ratify the 2011 Green Belt Development Plan with the state governments of Puducherry and Tamil Nadu
- Create informative and educational signage for the Green Belt boundaries
- Create goals and objectives for the assessment of a Growth Management Strategy
- Develop a Green Belt communication directory