A bee visiting a Hyacinth bean flower. Hyacinth bean (*Avarekai* in Kannada), a good source of B-complex vitamins, potassium, zinc and copper, is considered a delicacy and is used in seasonal food preparations.

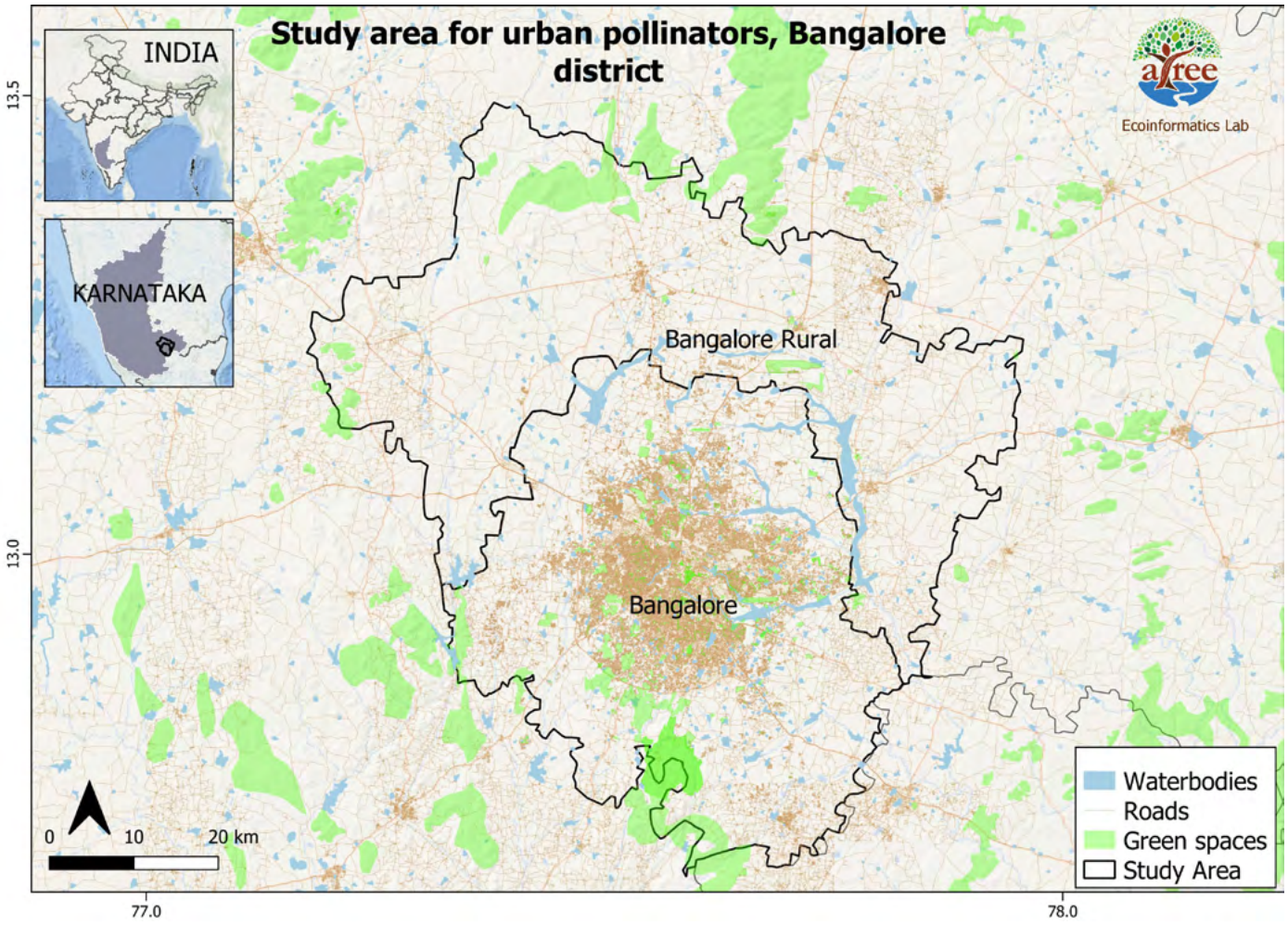
Supporting urban pollinators for food and environment

Policy brief | 2023

SHEFS

atree

Bangalore Urban



Executive Summary

Pollinators are a key component of natural and agricultural systems, helping pollinate many important foods such as fruits and vegetables. Indiscriminate use of chemicals in agriculture seriously threatens populations of pollinators. Additionally, expansion of urban development encroaches not only on surrounding agriculture, but also farm and natural habitats of pollinators. Nevertheless, urban farms and gardens, may in fact, be harnessed to support pollinators and the foods they help propagate.

In this brief, we explore the role of urban landscapes in creating habitat for pollinators, and suggest the following measures to enhance this habitat:

1. Planning pollinator habitat in urban farms and gardens
2. Adding pollinator-friendly features to urban landscapes
3. Enabling citizens and farmers to host urban pollinators

What is the Problem

Animals such as bees, flies, beetles and birds pollinate a majority of food plants. Pollination is a critical ecosystem service, with over 80% of crops depending to some extent on insect pollinators. Further, studies indicate that there is a sharp increase worldwide in cultivation of pollinator dependent crops such as fruits, vegetables, nuts, coffee and cocoa. Crops dependent on animal pollinators are rich sources of vitamins A and C, lipids, lycopene, and antioxidants. It is therefore alarming that populations of pollinators are declining all over the world. Loss of pollinator abundance and diversity would have grave consequences not just for agricultural production, but also for food and nutrition security. At the current levels of pollinator loss, the production of important foods would fail to meet the rate of consumption.

Pollinator-dependent crops are particularly significant to urban agriculture. Unlike cereals, they have lower space requirements and are more amenable to growing in cities. Besides, urban agriculture has significant benefits including reduction of dependence on rural areas for food production, shorter supply chains and thus a lower carbon footprint, making cities more sustainable and liveable. So-called green features such as lawns are popular in cities, but do not support pollinators or any other forms of urban biodiversity. Urban agriculture, on the other hand, has the potential to support a variety of life forms. Policy nudges in the form of land zoning for pollinator-friendly agriculture and gardens in urban development master plans, financial incentives for pollinator-friendly farming and gardening, and guiding pollinator-friendly greening can go a long way in supporting pollinator habitat and the nutritious foods they help produce.

Understanding the problem

External drivers

- Land development
- Increased in-migration

Urban landscapes do not sufficiently support pollinators

Urban expansion is increasingly replacing rural and urban farming

Urban and rural farming relies significantly on pollinators

The polulation of pollinators is seriously threatened by loss of habitat

Loss of pollinators poses a high risk to urban and rural food production

External impacts

- Green deserts
- Green space deficit

SHEFS

atree

The Research

Introduction

Just how much of what we eat is dependent on pollinators? Bengaluru, a fast-growing Indian city with people from different cultural backgrounds and varied dietary habits, offers an ideal setting to assess diet dependence on pollinators in an urban context. The study was designed to estimate the extent of dependence on pollinator-mediated foods, to determine what foods were highly pollinator-dependent and how important they were to urban diets. A second part of the study assessed the growing interest in urban agriculture and explored the opportunities and challenges associated with establishing pollinator-integrated edible gardens in the city.

Methods

Data was collected by means of a two-part online survey as the Covid-19 situation prevalent at the time prevented us from conducting an in-person survey. A questionnaire was designed to record the various foods consumed by the respondents, as well as the frequency of consumption. Secondary data was used to classify each food item as pollinator-dependent, partially dependent, or independent. The survey also touched upon food choice and access. The second part of the questionnaire revolved around garden space, plant composition and edible gardening.

SHEFS

atree

Findings

Our findings indicate that half to more than half of our diet relies on pollinators. Foods that are both highly pollinator dependent and regularly consumed include spices, oils, pulses, most vegetables, and fruits. These foods are also, typically, the most micronutrient-rich. Coffee, chocolate, and honey were some other highly pollinator-dependent foods that were consumed regularly by most of the respondents. Respondents ranked nutritional content and availability of foods as the most important drivers of food choice.

The results show that about half the respondents had gardens. Although growing ornamental plants was most popular, a third of garden-owners surveyed grew edibles such as vegetables and fruits. Lack of time, space and know-how were listed as the major constraints in setting up edible gardens in the city. What was noteworthy was that a staggering 80% of respondents who did not have edible gardens expressed interest in growing their own food. During the study, we also came across several gardening start-ups and companies, many of which specialised in setting up edible gardens.

Several staple and special foods in our diet are pollinator-dependent.

The growing interest in edible gardening offers scope to integrate pollinators in the urban landscape.

What can be done?

Various State Departments of Horticulture engage with urban residents and farmers on locally appropriate species of food for urban farms and gardens. These programmes should incorporate a component on capacity-building and education on the role of pollinators in growing nutritious foods, and how to support them. Residents, farmers, and businesses involved in urban farming and gardening can explore the potential of planting pollinator-friendly species in kitchen, rooftop, and vertical gardens. Local municipal guidelines on development, farming, and gardening will play an important role in prescribing species and spaces where pollinator-friendly features can be incorporated.

Financial incentives can be made available to developers and landowners to set aside and maintain a portion of pollinator-friendly habitat, along the lines of grey water recycling, rainwater harvesting, and solar energy schemes. Additionally, existing public parks, school gardens, and nutrition gardens can add a pollinator section that actively supports pollinators through design and structural features like nesting spaces and food and habitat species. Such a section would further serve to educate the public about the role of pollinators in the production of nutritious foods, and the importance of urban landscapes in supporting these pollinators.

Solving the problem

Planning pollinator habitat in urban farms and gardens

Issue farming, greening, and horticulture plants that include pollinator-friendly and indigenous food species

Offer financial incentives (e.g. tax subsidies) for land owners and developers to incorporate pollinator-friendly features

Adding pollinator-friendly features to urban landscapes

Introduce ‘pollinator park’ sections in public and school gardens for awareness and education on the role of pollinators in food and nutrition

Add pollinator-friendly indigenous species in guidelines for residential layout development along the lines of solar and rainwater harvesting

Enabling residents and farmers to host urban pollinators

Provide residents with resources on community, home, and rooftop gardening to support pollinators

Connect residents, farmers, and businesses to develop innovative non-chemical urban farming and gardening structures

Related SDGs

SHEFS

atree

How?

Planning

Guidelines and plans to plant pollinator-friendly food and indigenous species in urban farms and public and home gardens through:

- The State Department of Horticulture.

Financial incentives for land owners and developers to promote maintenance of pollinator-friendly urban spaces through:

- The local Municipal Planning Department
- The local Development Authority.

Adding

Pollinator-friendly landscape features to urban green spaces through:

- The State Department of Urban Housing and Development,
- State Department of Education,
- Municipal Parks Department,
- Local Resident Associations.

Enabling

Public awareness and **engagement** through campaigning by:

- NGOs
- Businesses.

Edibles such as beans can be grown even in small spaces such as the balcony garden shown here.

Harvest from a single Chayote squash plant in a home garden in Bengaluru city.

Insect pollinators such as bees are essential for Chayote squash reproduction.

Most of the fruits we eat, both native and exotic, are pollinator-dependent.

Policy Brief produced in 2023 by the Ashoka Trust for Research in Ecology and the Environment (ATREE) under the Sustainable and Healthy Food Systems (SHEFS) programme.

Prepared by:
Chethana Casiker, Soubadra Devy, Mridula Paul, and Mallika Sardeshpande

Design by:
Chendil Kumar P.