



ALLEGHENY COLLEGE

FS 201 Chapter 5 Summary

Ch.5 Summary

Submitted To:

Utz, Steven

Professor

Environmental Science

Department

Submitted By :

Daniel Ocampo

Jason Patterson

Spring Semester

Contents

1	Introduction	2
2	Walls	2
3	Roads	4
4	Railways	5
5	Infrastructural trees	6
6	Sewers and Canales	7
7	conclusion	8
8	Questions	8
9	Self Evaluation	9

1 Introduction

The building of cities and towns has been apart of the development of human society since its beginning. Eventually the cities developed their own unique ecosystems based around the changing from nature to an urban environment covered in man-made buildings and other infrastructures. The book *Urban Ecosystems: Understanding the Human Environment* explores this new urban ecosystem looking at different aspects of it. A new part of urban ecosystems is the man-made structures that dominant urban environments. Despite that it might seem that these various infrastructures do not possess any real ecological worth or opportunities to support biodiversity, these built environments can support some diverse environments within an urban setting. The different man-made structures that make up the urban ecosystems all offer conditions very different from natural ecosystems that can support a wide range of plants and organisms. Urban buildings and infrastructure are important pieces of the urban ecosystem that can support a range of species.

2 Walls

Buildings are the basic structures of every populated place and walls are a component feature of buildings. Walls are a necessity to create urban environments and as so dominant urban settings. Walls can maintain a surprisingly high level of biodiversity

evidenced by a British study that documented 226 different plant species on walls in Durham, United Kingdom (Francis 91). The ecosystems that develop on walls are made up of multiple different micro environments with two large habitat areas forming on the bottom and top of the walls where sediment with nutrients and moisture can accumulate and offer the conditions for the growth of seeds that end up in cracks and fractures in walls (Francis 93). The vertical surfaces of walls usually have minimal plant growth that is mostly lichens due to a moisture gradient that goes down the wall. There are many factors that can affect wall environment and can impact the walls carrying capacity which include age of the wall, dimensions of the wall, building materials, moisture, pollution levels, and others (Francis 92). Species that can be found in wall environments are generalist species that live despite the tough conditions of the wall environments and are generally disturbance tolerant species. Living walls and green facades are becoming an increasingly popular option among cities in recent years and offer the potential to increase levels of biodiversity in urban settings and offer advantages like limiting runoff and decreasing surface and building temperatures (Francis 94). Walls are the building blocks of civilization and offer the ability to support wide range of organisms and plants.

Roofs like walls are the building blocks of man-made environments and make up a large piece of urban space. Roofs are basic environments that do not offer a lot to support a diverse environment. Birds and other small organisms that can fly are

most often found on roof environments for the safe place to nest and roost (Francis 95). Just like living walls, living roofs have become increasing popular features and possess the same benefits as living walls. Living roofs can be made to replicate different environments by changing factors like soil nutrients or pH. There are multiple types of living roofs that support varying levels of biodiversity, for instance brown roofs are made to simulate brownfields for their relatively high biodiversity in urban environments (Francis 97). There is limited amounts of research on roofs and their ecosystems but because of their presence in urban areas roofs represent major pieces of urban ecosystems.

3 Roads

Roads are important features of urban areas and are the main transportation corridor for humans. Roads also act as transportation corridors to facilitate species movement as well as offer habitat (Francis 98). Because of the heavy use of roads and frequent disturbances that urban roads experience there is lower levels of diversity on the roads themselves but other features of roadways offer more potential. Verges along the side of roads offer the highest levels of diversity and are similar to edge environments for the relative large diversity in smaller space, generalist species, and buildup of nutrients, sediments, and seeds (Francis 99). While roadside verges

offer the most diversity along road corridors there are limited number of verges in urban areas and are often more intensely managed limiting diversity. Roads offer the opportunity for species movement and can support some generalists in urban environments.

4 Railways

Railways bring great diversity for species by providing railing. The reason is because the railing and gravel stones provide a nice habitat for species that can survive living under rocks. Similar to roads many of the railways have the ability to provide a good place for plants such as herbs. Railways also contribute to grass species. For example, in Germany there have been over 1000 plants species, that were found in urban railways. Due to the new structure that is provided by the railways, 305 new species have created a new habitat in the railways.

Underground railways are usually located under urban locations, although there is not much study done in underground railroads. With the studies that have been done, researchers found that there are negative impacts based on the pest found there. For example, mosquitoes in underground railroads have been known to bite humans. The negative impact is that they have the potential to transfer virus to other individuals.

5 **Infrastructural trees**

Infrastructural trees are usually the main source of a vegetated ecosystem in urban locations. Most urban locations had between 50 and 80 trees per 1000 residents, although many factors contribute to the demand for trees with some places that were 6 tree per 1000 residents. Specifically urban places in early Hong Kong, that are younger and less dense. Although, there are benefits to ecology of having trees in urban areas, there are also some negative effects. For example, trees can ruin roads, block views, spread plant diseases, contribute to allergens, and in some case the tree itself can damage property by falling. These are some of the main factors that contribute to trees being unappealing to urban areas.

When trees are planted in location where they cannot get their proper requirements to maintain a living tree, it tends to shorten the lifespan, and the growth of the trees. The average lifespan of trees is between 10-60 years, depending on the resources in the urban city. Cities tend to take proper maintenance of tree so that they can survive for good period of time. Despite maintenance in urban areas, vandalism tends to occur. 30% of vandalism for new planted trees occurred in the UK. although in european countries we were able to see that that vandalism was under 5%.

Diversity in the subject of trees has great importance because it prevents the spread of tree disease. Although many of the trees come from the same genera the diversity

in trees is very high in urban areas. Trees in urban areas are very important because of the ecological impact. Each individual tree brings its own species that help build the urban ecosystems

6 Sewers and Canales

Canals are either created or modified to give irrigation and give water supply. Canals are not really researched and not looked at for ecological impact enough. There is still much that is unknown for the topic of canals. What is known about canals is that urban areas tend to be polluted. Despite this there is still a large aquatic ecological factor in the canals. Many animals like plants, fish, algae, diatoms, and birds manage to live in canals.

Sewers tend to overflow and thus create pollution for canals. This could potentially be dangerous because of the bacteria that can be drunk because some of the canals supply fresh water. This can potentially cause severe sickness for those exposed. Sewers are very unique in the sense it could potentially have a very complex ecosystem but because of the lack of interest much is not known about sewers. This is despite the fact there could be a wide range of unknown species living down there. For instance there have been cases where new creatures have been found living in the sewers that have never been seen before. The sewers are expected to have a higher ecosystem in

the future, then the ones that currently exists.(Sewers are known to have pest such as cockroaches, rats, and mosquitoes making it very unattractive.)

7 conclusion

Urban ecosystems are unique environments found across the globe. The surprisingly high diversity that is found on walls or roofs as well as other places shows the ecological value they hold within an urban setting. These structures despite being man-made are important places of habitat for many species and sometimes are the only source of vegetation within urban settings. The value of these infrastructures ecologically is immense and provide opportunities to increase biodiversity in urban settings.

8 Questions

1. What are the main similarities and differences between urban green spaces and build environment? The main differences I though was diversity in urban green spaces, where as in a build enviroment the person gets more of the same generic stuff.
2. Have you seen a living roof or wall? Why is their popularity growing in urban

areas?

Well for starters many people are starting understand the benefits of having living roof. I have not seen one around my city.

3. What factors would you need to consider when planning a planting campaign?

The factors that we considered before planning a green wall would be if it looks pleasing and if so what effects would it have on the city.

4. Why are sewerage and canal systems relatively under-explored as ecosystems?

Sewerage are hard because of the pest that live down there and the awful smell that is left. There is also a bad connotation as well.

9 Self Evaluation

I felt that some of the questions were a little off topic, question 2 in particular caught my attention. Maybe if the real question for 2 would be the pros and cons of having a living roof or wall. I think this would have had the students think more, while also getting the conversation to where they have seen a living roof or wall. This question was mainly directed to question two. Another question that might be improvised that would make for a better discussion would be on question 4. It was a very easy question to answer and

felt it should have been modified to how and not why. In the sense that how would we get people to explore the sewers. I feel that getting people to be open about the subject should be very interesting. Considering the fact it is indeed a novel study. The next best thing is explore. For example, the canals, maybe show them if the canals are polluted through microscope if possible.

References

- [1] Robert A Francis and Michael A Chadwick. *Urban ecosystems: understanding the human environment*. Routledge, 2013.