Urban strategies for Waste Management in Tourist Cities

D2.6 – Ecosystem services and tourism in the URBAN WASTE pilot cities

Part 1: literature review, survey results and ideas for ecosystem service assessment

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Abstract

This is the first part of Deliverable 2.6 of the H2020 project URBAN WASTE. The Deliverable deals with the connection of ecosystem services and tourism. Understanding how ecosystem services contribute to touristic experiences fosters engaging in practices related to sustainable tourism, which plays an important role for waste production and management in the 11 pilot cities.

The current version of the deliverable reviews relevant literature and summarizes results from a survey on tourists’ and tourist staff’s perceptions of ecosystems services in the cities, conducted in URBAN WASTE’s work package 3.

For the second and final version of the Deliverable, we propose to conduct a benchmark of the cities’ state of environment based on various European and global datasets, followed by descriptions of selected ecosystem services in the cities. This can be used in the later work on strategies (work package 4) and impact assessment (work package 7).

Contributors

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<th>NAME</th>
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List of abbreviations

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<tr>
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<td>UCPH</td>
<td>University of Copenhagen</td>
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<td>WP</td>
<td>Work Package</td>
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<td>Deliverable</td>
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<td>CoP</td>
<td>Communities of Practices</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>EU</td>
<td>The European Union</td>
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<td>EC</td>
<td>European Commission</td>
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<td>EASME</td>
<td>European Agency for Small and Medium Enterprises</td>
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<td>ES</td>
<td>Ecosystem Services</td>
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1 Introduction

This report deals with the connection of ecosystem services and tourism. Understanding how ecosystem services contribute to touristic experiences fosters engaging in practices related to sustainable tourism, which plays an important role for waste production and management in the 11 pilot cities of the URBAN WASTE project.

The current version of the deliverable provides an overview of the relation between ecosystem services and tourism, based on a short literature review (Chapter 2) and results from a survey with tourists and tourist workers in the pilot cities (Chapter 3). There is no consensus in the literature on how to assess ecosystem services and empirical research on cultural and urban ecosystem services is limited. Most relevant in the context of URBAN WASTE are some provisioning services and a variety cultural services, incl. recreation, ecotourism, aesthetics, and services of spiritual, learning and heritage importance. The survey shows that freshwater provision, local food provision and cultural heritage are evaluated very important in all cities.

For the second and final version of the Deliverable, we propose to conduct a benchmark of the cities’ state of environment based on various European and global datasets followed by descriptions of selected ecosystem services in the cities. Chapter 0 provides a list with potential indicators for the benchmark. The benchmark can provide a basis for comparison of different ecosystem service cases, as proposed in Chapter 5. Results from this work can be used in the later work on strategies (WP4 – e.g. How can selected ecosystem services be used to improve tourism and waste management, or which impacts on selected ecosystem services should be considered when developing strategies) and impact assessment (WP7).

To ensure the usefulness of the results in the project, other partners will be included in the elaboration and validation of the benchmark as well as the case study selection and description, before, during and after the project meeting in Copenhagen in May/June 2017 (month 12/13). The final version of this Deliverable will be ready by August 2017 (month 15).
2 Reviewing ecosystem services and their relation to tourism

2.1 The concept of Ecosystem Services (ES)

"Ecosystems are shaped by the interaction of communities of living organisms with the abiotic environment. [...] Ecosystem functions are defined as the capacity or the potential to deliver ecosystem services. Ecosystem services are, in turn, derived from ecosystem functions and represent the realized flow of services for which there is demand." (J Maes et al., 2013, p. 16)

In this sense, ecosystems provide benefits – goods and services – for people. Ecosystem services are conceptualised (see Figure 1) by linking “socio-economic systems with ecosystems via the flow of ecosystem services” (J Maes et al., 2013, p. 16).

![Figure 1: Conceptual framework for EU wide ecosystem assessments (J Maes et al., 2013)](image-url)
2.2 Typologies of ecosystem services

Within the concept of ecosystem services, exist different approaches and typologies of ecosystem services. Currently three main international classification systems are available.

The Millennium Ecosystem Assessment (MEA, 2005) is one of the main sources for the definition of ecosystem services and its connection to human well-being. Ecosystem services are organised in four groups:

- **Provisioning services** (Food, fresh water, wood and fibre, fuel, ...)
- **Regulating services** (Climate regulation, flood regulation, disease regulation, water purification, ...)
- **Cultural services** (Aesthetic, spiritual, educational, recreational, ...)
- **Supporting services** (Nutrient cycling, soil formation, primary production, ...)

This classification was further developed by TEEB and CICES. “The Economics of Ecosystems and Biodiversity” approach (TEEB, 2010) links economics to ecosystem services and ecology. The TEEB classification of ecosystem services considers:

- **Provisioning services** (food, water, raw materials, gens, medicinal resources, ornamental resources)
- **Regulating services** (air, climate, extreme events, water flows, water treatment, erosion, soil, pollination, biological)
- **Habitat or supporting services** (maintenance of life cycles and genetic diversity)
- **Cultural and amenity services** (aesthetics, recreation and tourism, inspiration, spiritual, cognitive development)

“The Common International Classification of Ecosystem Service” (CICES) (EEA, 2017) has only three main classes of ecosystem services:

- **Provisioning services**
- **Regulation and Maintenance services**
- **Cultural services**.

We will base our further work on ecosystem services in the URBAN WASTE project on CICES, as it is the most current classification and used by important agencies as the European Environment Agency.

2.3 Mapping and assessment of ecosystem services

A major challenge – and consequently a diversity of approaches – lies in mapping and assessing ecosystem services at specific sites or areas. The development and improvement of indicators is a major topic in much of contemporary research on ecosystem service mapping and assessment.

Urban areas, cities and towns are “both consumers and producers of ecosystem services” (Sandhu & Wratten, 2013, p. 11), as they depend very much on the surrounding ecosystems to fulfil daily needs. However, urban green spaces also provide ecosystem services themselves. Haase et al. (2014, p. 414) promote the importance of urban ecosystems by emphasizing that “functioning ecosystems provide the flexibility in urban landscapes to build adaptive capacity and cope with problems such as increased risks of heat waves and flooding”. Considering the challenges of rapid urbanisation and sustainable development the benefits of urban biodiversity on well-being in cities gains even more importance. Haase et al. (2014, p. 414) name a “diverse set of land uses, including parks, cemeteries, golf courses, watercourses, avenues, gardens and yards, verges, commons, green roofs and facades, sports fields, vacant lots, industrial sites, and landfills” that provide urban ecosystem services.
Haase et al. (2014) conducted a meta-analysis on scientific papers published on urban ecosystem services. As part of their results, they show that only 0.2% of the studies (217 in total) dealt with tourism. In contrast, an empirical review on cultural ecosystem services (Hernández-Morcillo, Plieninger, & Bieling, 2013) finds that more than 50% of the used indicators (42 studies in total) address recreation and (eco)tourism. However, overall, cultural ecosystem services are yet rarely taken into consideration in ecosystem service research (Schaich, Bieling, & Plieninger, 2010). Daniel et al. (2012, p. 8813) also state that the “importance of cultural services has consistently been recognized, but in the rare instances in which there is any further consideration, they are often characterized as being “intangible,” “subjective,” and difficult to quantify in biophysical or monetary terms [...] thus retarding their integration into the ES framework.”

Combining those findings, there appears to exist a gap in addressing tourism related ecosystem services, particularly in urban areas. Likewise is the development of indicators for the assessment of urban ecosystems still challenging; redundancy in indicators, linking indicators to benefits and services as well as capacity of indicators to capture services at multiple spatial and temporal scales are only some of the challenges (Haase et al., 2014).

A comprehensive approach towards capturing urban ES was conducted as part of the MAES project – Mapping and Assessment of Ecosystems and their Services (Joachim Maes et al., 2016). Urban ecosystems are in their understanding recognised as socio-ecological systems that are composed by the following elements:

- Built infrastructure
- Green infrastructure
- Urban green spaces

Built and green infrastructure have a (multi-)functional connotation whereas urban green spaces are considered to have a structural connotation – they are the structural components of green infrastructure. Typologies of urban green spaces are usually distinguished in structural and/or functional classification approaches (Joachim Maes et al., 2016). For mapping and assessment of urban ecosystems and their services, they provide indicators on three scales:

- Regional scale
- Metropolitan scale (functional urban area, FUA)
- Urban scale (core area of the FUA, “city”)

Maes et al. (2016) provide a list of key ecosystem services regarding relevance in urban areas. In terms of provisioning services they consider provision of food and water as those with most importance in cities; regarding cultural services these are nature based recreation and education, and cultural heritage. As main providers of cultural ecosystem services in urban areas, Maes et al. (2016, p. 88) name “urban forests, crop fields, fruit trees, private and public gardens, parks and playgrounds, fresh water bodies, and coastal and marine ecosystems”. Furthermore, protected areas such as Natura 2000 need to be considered.

### 2.4 Ecosystem services and tourism

Recreation and tourism are considered as cultural ecosystem services, however, according to the CICES framework it is understood only as “physical and intellectual interaction with the environment” (Kulczyk, Woźniak, Kowalczyk, & Derek, 2014, p. 85). Based on a semi-quantitative literature review on cultural services, Milcu et al. (2013) identified 11 subcategories of cultural services:

- Recreation and ecotourism
- Aesthetic values
- Spiritual and religious values
- Educational values
- Cultural heritage values
- Bequest, intrinsic and existence
- Inspiration
- Sense of place
- Knowledge systems
- Social relations
- Cultural diversity

The list mostly relates to non-material benefits (Egoh Benis, Drakou, Dunbar Martha, Maes, & Willemen, 2012). Besides ‘recreation and ecotourism’, many of the above-mentioned cultural services can be considered as relevant for tourism (e.g. aesthetic values, culture heritage). This is also confirmed by Hernández-Morcillo et al. (2013). They mention, for example, spiritual sites such as churches can be considered both as places of spiritual value and as touristic sites. This exemplifies that sites or elements of ecosystems can provide multiple services.

One of the few projects dealing with the nexus between ecosystem services and tourism is “Tourism, Wellbeing and Ecosystem Services” (TObeWELL, 2015). Part of the project was the development of a research tool, based on a questionnaire, “to empirically value the benefits of visited landscapes for tourists and visitors”. The tool can be used for comparing landscapes as well as assessing trends and evaluating effects of landscape changes. (Smith & Ram, 2017, p. 116 f.)

Also Daniel et al. (2012) acknowledge the importance of recreation and tourism, such as walking, camping or nature study, as part of cultural ecosystem services and also its contributions to physical and psychological well-being, such as “physical exercise, aesthetic experiences, intellectual stimulation, inspiration” (Daniel et al., 2012, p. 8814). However, recreation and tourism are at the same time considered as a threat to ecosystems through, e.g., “wildlife disturbance and habitat fragmentation [...] and negative offsite effects are commonly attributed to traffic emissions and infrastructure developments for tourism” (Daniel et al., 2012, p. 8814).

According to Willis (2015) natural resources provide an important condition for enhancement in psychological well-being. Willis suggests that cultural ecosystem services can “be understood in terms of ecosystems’ contributions to benefits which are argued to be the constituents of psychological well-being” (Willis, 2015, p. 40). This starting point is very relevant for discussing the role of nature in tourism or tourists’ experiences. On the one hand, because it helps understanding tourists’ motivations for visiting certain places and, on the other hand, because it implies the need to maintain those natural resources (Willis, 2015), which – considering the threat of tourism on ecosystems (Daniel et al., 2012) – calls for sustainable tourism strategies.

In this sense, understanding how ecosystem services contribute to touristic experiences fosters engaging in practices related to sustainable tourism, such as reduction of waste generation and improving waste management, in order to preserve those contributing services.
2.5 Ecosystem services in the context of the URBAN WASTE project

In this deliverable, we focus on ecosystem services and tourism, as tourism is a core theme of URBAN WASTE. Recreation and tourism are part of cultural ecosystems services in the CICES classification (EEA, 2017). However, the literature also considers most other cultural ecosystems services as relevant for tourism as they are for example defined in Milcu et al. (2013). Furthermore, following Maes et al. (2013), we consider provisioning services as water and food, as they are directly relevant for tourism. For the subsequent work, we will therefore focus on the following ecosystem services:

- Provisioning services
  - Provision of local freshwater
  - Provision of local food
- Cultural services
  - Recreation and ecotourism
  - Aesthetics / beauty
  - Spiritual / religious meaning
  - Learning and teaching
  - Cultural heritage
  - Inspiration, Sense of place
3 Tourists’ and tourist workers’ ranking of ecosystem services in the pilot cities

Between mid-November 2016 and mid-January 2017 three surveys targeting waste workers, tourist workers and tourists were conducted in all 11 pilot cities. The surveys, coordinated by WP3, focus on waste management and behaviour/attitudes. Additionally, we added two questions regarding ecosystem services in the tourist workers- and tourists-survey. Details on the survey methods and results can be found in Deliverable 3.2 (URBAN WASTE, 2017).

![Responses per city and survey](image)

The tourists and tourist workers were asked to rate the importance of the following ES (“Very Important … Somehow important … Not important”):

- Provision of local freshwater
- Provision of local food
- Recreation and ecotourism
- Aesthetics / beauty
- Spiritual / religious meaning
- Learning and teaching
- Cultural heritage
- Inspiration, Sense of place
Table 1: Top 4-Ecosystem Services ranked as “very important” by tourists and tourist workers

<table>
<thead>
<tr>
<th>Location</th>
<th>Tourists</th>
<th>Tourist workers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 2 3 4</td>
<td>1 2 3 4</td>
</tr>
<tr>
<td>Copenhagen</td>
<td>![Image]</td>
<td>Less than 10 responses</td>
</tr>
<tr>
<td>Dubrovnik</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>Florence</td>
<td>Less than 10 responses</td>
<td>![Image]</td>
</tr>
<tr>
<td>Kavala</td>
<td>![Image]</td>
<td>Less than 10 responses</td>
</tr>
<tr>
<td>Lisbon</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>Nice</td>
<td>![Image]</td>
<td>![Image]</td>
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<tr>
<td>Nicosia</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>Ponta Delgada</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>Santander</td>
<td>![Image]</td>
<td>![Image]</td>
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<tr>
<td>Syracuse</td>
<td>![Image]</td>
<td>![Image]</td>
</tr>
<tr>
<td>Tenerife</td>
<td>![Image]</td>
<td>![Image]</td>
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</tbody>
</table>

Legend

- Freshwater
- Provision of local food
- Recreation and eco-tourism
- Aesthetics / beauty
- Spiritual / religious meaning
- Learning and teaching
- Cultural heritage
- Inspiration, Sense of place
- Other (tourist survey only)
Almost in all cities and both surveys the following three are in the Top 4:

- Freshwater provision
- Local food provision
- Cultural heritage

Other ecosystem services seem to be relevant only in some cases, as spiritual / religious meaning and learning in Florence and Syracuse. Even recreation and ecotourism are only ranked in some cities into the Top 4. Table 2: Suggestions for ES cases (from survey and previous discussions)In a study of the perception of cultural ecosystem services from Germany (Plieninger, Dijks, Oteros-Rozas, & Bieling, 2013), recreation (split into various subcategories) was mentioned as the most important service. The difference in our survey might be caused from having only one category for recreation. Aesthetics, social relations and educational values rank second in the German study, while spiritual services, sense of place, cultural heritage and inspiration rank lowest. A different explanation could be the different motivation of tourist to visit a place, were particular sights can play a big role additionally to general aspects of recreation.

Tourist and tourist workers were also asked to give examples for those ES they rated as “very important” (e.g. name of an area, name of a product, name of a resource, type of usage). Table 2 shows a summary of the answers [this still needs to be edited and interpreted and will feed into the discussion of case selection in Chapter 5].

Table 2: Suggestions for ES cases (from survey and previous discussions) – answers were given in different languages and translated, if necessary, with the help of Google Translate

<table>
<thead>
<tr>
<th>City</th>
<th>ES case</th>
</tr>
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<tbody>
<tr>
<td>Copenhagen</td>
<td>Harbour or the old fortification – urban/water ecosystem, tourist site (little mermaid), bathing</td>
</tr>
<tr>
<td></td>
<td>Amager Strandpark</td>
</tr>
<tr>
<td>Dubrovnik</td>
<td>“Dubrovnik, Ombla river source of fresh water in danger because Grabovica junk yard a few miles away. Local original sorts of wine like Plavac mali, Malvasija, Posip etc. Local olive oil, Ston OYSTERS, figh... Cultural heritage, monuments, folklor, a capella singing...”</td>
</tr>
<tr>
<td></td>
<td>“Availability of drinking water Dubrovnik - drinking water from the fountain, Esterik, the beauty of the purity streets of the city - all the public areas, especially the more attention given green space, clean sea and beaches, organization. Recreation and ecotourism - sufficient offer sdrzaja for all age groups. Local culinary specialties - strive to be in the hundreds of restaurants offer more authentic dishes - exploring culture and utilization of local growers and producers - as well as the diversity of offers. Cultural heritage - getting to know the local history of the place / city. Inspiration - a sense of place - impressions of touch with local people - hospitality and service workers.”</td>
</tr>
<tr>
<td>Florence</td>
<td>City center, public free fresh water for tourists and citizens</td>
</tr>
</tbody>
</table>
“Toscany is really rich of tremendously good local food such as meat, cheese and vegetables. The landscape in the surrounding is really worth the trip.

Tuscany life style; Florence city of culture and world heritage, the beauty of the old town

Tourists can be sensitive to the services that affect his health

The historic center of Florence UNESCO Heritage Site: The urban complex of Florence is in itself a unique artistic achievement, a masterpiece, the result of continuous time creating six centuries. Here we find, besides the museums, the strongest concentration of d’art known throughout the world. From the fifteenth century, Florence exerted a ‘dominant influence on the development of architecture and monumental arts, first in Italy and then in Europe. The artistic principles of the Renaissance have been defined since 1400 by Brunelleschi, Donatello and Masaccio. It is within the Florentine realities that have formed and established two geniuses: Michelangelo and Leonardo da Vinci. The historic center of Florence brings an exceptional testimony, both as merchant cities of the Middle Ages and of the Renaissance city. Florence has preserved intact streets, fortified palaces Lodges, fountains, Ponte Vecchio. The trades, organized into guilds, have left several monuments. Numerous palaces, from the fourteenth to the seventeenth century, are testimony to the power attained by Principles and bankers E ‘during the period of the Neo-Platonic Academy that was forged the concept of Humanism and the Renaissance.”

<table>
<thead>
<tr>
<th>Location</th>
<th>Description</th>
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<tbody>
<tr>
<td>Kavala</td>
<td>some island (forgot name) close to Kavala which gets many tourists</td>
</tr>
<tr>
<td>Lisbon</td>
<td>“buy fresh food on the market”</td>
</tr>
<tr>
<td>Nice</td>
<td>“Mediterraneans sea”</td>
</tr>
<tr>
<td>Nicosia</td>
<td>“Local fresh water - provided all over the city in the form of dispensers</td>
</tr>
</tbody>
</table>

Local food - restaurants and other food providers should be encouraged to include in their menus local food options for the visitor to appreciate the local gastronomy and culture of our country. Examples: tzatziki, xoriatiki salada, kouloumbra, kolokasi, koupepia,ourgouri, hal-loumi, kappama, traditional sweets such as karydaki, soutzoukko, halva

Recreation and eco-tourism - visitors should be given the opportunity to visit natural areas that conserve the environment and sustain the well-being of the local people. The idea here is to build environmental and cultural awareness and respect as well as provide positive experiences for the visitors.

Cultural heritage - Ecotourism adds value to cultural traditions and practices. As the world becomes westernized, traditional dances, festivals, methods for preparing food, or storing
water may become obsolete. The way ecotourism functions to preserve traditional life certainly does not aim to impede progress. Instead, it offers incentives to keep tradition alive and to preserve the heritage of a culture, village, or country because ecotourists are willing to learn about such things.

**CONCLUSION:** There is an urgent need to locate private and public initiatives, bring them together under a suitable means of communication such as a web platform in order to give visitors (and locals) a variety of options to choose from.”

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<tr>
<th>Location</th>
<th>Description</th>
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| Ponta Delgada | “we searched out restaurants in Ponta Delgada e Funchal that served local food. we visited churches furnas hot springs, hikes on islands of madeira local market in funchal, gardens in Ponta Delgada” [probably cruise tourists who visited Funchal/Madeira and Ponta Delgada/Azores]  
“Termalpool Caldeiras das Furnas”  
“lagoa de fogo”  
“Vista do Rei - Sete Cidades | Azores Trails”  
“The main attraction of the Azores is nature in general. Much more than culture, religion, etc.”  
“Extreme activities (in contact with nature). Local religion and all movements.”  
“Leisure activities such as whale watching, mountain biking, etc.” |
| Santander | “Parque de la vaguada de Las Llamas” |
| Syracuse | Nature protection area close to city (about 10 km)  
“wine production - importance of protected areas (Ciane, Saline, Plemmirio)”  
“Provision of local freshwater WOULD be important, but unfortunately tap water from Siracusa cannot be considered (or offered to tourists) as drinking water. So much plastic for bottled water could be safe if tap water was truly drinking water.  
Food is one of the main reasons tourists visit our area, luckily almost all produce is grown locally.  
Recreation and ecotourism WOULD be important to the area, but practically inexistent.  
Aesthetics/beauty - the area is so beautiful by itself, unfortunately that beauty is very often spoilt with garbage along the roads.  
Cultural heritage is the main reason people visit this area, too many to mention. Unfortunately also those areas are often cluttered with garbage!” |
| Tenerife | - El Teide national park + heritage site  
- Anaga Biosphere Reserve  
- 43 protected areas in the Canary Island Network + 56 conservation areas (natura 2000)  
“trekking ecoturismo”  
“The Canary Islands need always freshwater, half of them are almost desert.” |
4 The state of the environment in the pilot cities

This section will be developed for the final version of the Deliverable.

Mapping and assessment of urban ecosystem services is yet not sufficiently developed and only few studies address urban ecosystems at all. As all the 11 pilot cases in URBAN WASTE are – at least to a certain extent – urban areas, this research gap is a challenge for our work. A feasible way is following Maes et al. (2016), who approach the assessment of ecosystem services by first evaluating the ecosystem condition. Based on a comprehensive set of indicators (see Figure 4) we can use proxy indicators to evaluate the state of the environment in the pilot cases with relevance for tourism.

Besides the choice of the indicators, the selection of the spatial scale needs to be discussed. We propose to use 10 km rings from the urban centre of the cities to enhance comparability (opposite to very diverse administrative boundaries) and to account for locally relevant ecosystem services. Figure 3 illustrates such a delineation. The approach would also be feasible as much environmental data is available on grid scale (e.g. CORINE land use in 100 m cells, Eurostat population grid in 1 km cells) or actual locations (coordinates) are available (e.g. location of bathing water test from EEA, points of interests from OSM). These data can be aggregated to any other spatial delineation.

Figure 3: Urban area in pilot cities and 10 km buffer ring as potential delineation for benchmarking. The buffer rings are examples. The centre of the buffer ring might need to be adapted/moved, the radius can be discussed and some rings might need to be cut (for e.g. the Turkish part in the case of Nicosia)
Maes et al. (2016) suggest a couple of indicators related to pressures and the state of urban ecosystems (Figure 4). Most of the indicators mentioned are available on relevant spatial scales. Another reference work are the EEA Core set of indicators (EEA, 2014), whereas however some of the indicators are currently in revision.

**Figure 4: Indicator framework for measuring the condition of urban ecosystems (Joachim Maes et al., 2016, p. 78)**

The following data sets could be considered for the analysis:

- Population density and development, based on Eurostat
- Degree of urbanisation, Eurostat
- Share of various land cover and development (from EEA/Copernicus, including CORINE and Urban Atlas)
- Share of sealed surface or imperviousness (from EEA/Copernicus)
- Share of Natura 2000 areas (from EEA/Eurostat)
- Other protected areas (Nationally designated areas (CDDA) from EEA, UNESCO sites…)
- Share of coastal areas (from EEA)
- Beach area, beach users etc. (through URBAN WASTE data survey)
- Fragmentation with high rank roads (OpenStreetMap)
- State of bathing water, based on EEA
- Various points of interest (e.g. inside park areas) based on OpenStreetMap

Figure 5: Example from protected areas database for Tenerife, http://www.eea.europa.eu/data-and-maps/explore-interactive-maps/european-protected-areas-1

As shown in Figure 4, the indicators should be calculated as share to total population, total tourists, total area etc. to account for the actual pressure on the ecosystem or its capacity. Some could also be trend indicators where data form several years is available (mainly land use and population). However, the number of indicators should be held relatively limited to keep it feasible and transparent.

Some first results could be discussed at the Copenhagen meeting with the pilot cities. Before that, the selection of indicators should be discussed within WP2 and relevant partners from WP4/WP7.
5 Examples of ecosystem services related to tourism in the pilot cities

This section will be developed for the final version of the Deliverable.

Various relevant ecosystems services will be exemplified by fact sheets of selected cases form the pilot cities, describing a selected (urban) ecosystem, the relevant services of it for tourism how we evaluate its effects in a wider understanding. Several examples were mentioned in the survey and previous project discussions, including “Amager Strandpark” in Copenhagen or the “Parque de la vaguada de Las Llamas” in Santander services. We will discuss the format with other project partners during the coming months.

Figure 6: Amager Strandpark in Copenhagen, Denmark [foto credits missing]

Figure 7: Parque de la vaguada de Las Llamas in Santander, Spain [foto credits missing]
6 Next steps

UCPH will initiate a discussion on relevant indicators and the format of the case fact sheets within WP2 partners. First test of data tests for the benchmark could be ready by month 11 (April 2017) to discuss WP2 internally, aiming at preliminary results to be ready for the Copenhagen meeting. In parallel, the case factsheet structure will be developed to discuss in Copenhagen including a list of potential cases covering different aspects of ecosystems services.

The final version of this Deliverable will be ready by August 2017 (month 15).
7 References


8 Appendix

The surveys on ecosystem services were integrated in the surveys on waste behaviour that were conducted and coordinated by WP3 between mid-November 2016 and mid-January 2017 in all 11 pilot cities. The surveys that targeted tourist workers and tourists included two questions regarding ecosystem services. Details on the survey methods and results can be found in Deliverable 3.2 (URBAN WASTE, 2017). Below are some socio-economic results regarding gender and education differences in the responses of tourist workers regarding provision of ecosystem services.

- “5.1 Please rate the importance of the following local ecosystem services for visitors in your city/region:”

![Chart showing provision of local freshwater by gender](chart1)

![Chart showing provision of local freshwater by education](chart2)

![Chart showing provision of local food by gender](chart3)
D2.6 Ecosystem services and tourism
D2.6 Ecosystem services and tourism

Inspiration, Sense of place

- Master/PhD
- Bachelor
- Highschool/Vocational qual.
- Primary School

- 1. Very Important
- 2. Somehow important
- 3. Not important
D2.6 Ecosystem services and tourism