

ECONOMIC VALUATION OF ECOSYSTEM SERVICES PROVIDED BY THE PARK IN WILANÓW

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A brief history of Wilanów



- John III Sobieski (1629-1696), King of Poland
- Not particularly happy with living in the city



- He bought Wilanów and established his suburban residence there.
- He founded a beautiful baroque palace and a garden.



Wilanów today

- The palace and the park attract both citizens of Warsaw and tourists.
- The park includes three major kinds of ecosystems: woodlands, grasslands and ponds.
- There is also a nature reserve Morysin adjacent to the residence.
- The park and Morysin provide numerous ecosystem services.
- What is the value of these services?



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Classification of ecosystem services

- Economic assessments of ecosystem services have been carried out at least for two decades.
- Costanza et al. (1997) is an early example of a global valuation study.
- Costanza et al. group ecosystem services into three categories:
 - I. provision of raw materials (to be consumed or used in production),
 - II. regulation of natural processes,
 - III. cultural functions (such as recreation).
- Within these three categories, Common International Classification of Ecosystem Services (CICES 2015) identifies 48 narrower (more specific) types of services.
- We assess the value of each type of ecosystem services.
- How to estimate these values?

Benefit transfer method

- The best way of valuation – an empirical, *in-situ* study
- But it is often impossible because of limited resources (time, money)
- An alternative – to extrapolate results from another study, conducted in a location similar to the one analysed

II

Transfer of benefits from a study site to a policy site

- The lack of exact equivalence between original circumstances and the policy site can cause errors, but the errors may be minor compared to the effort of conducting a new study

Benefit transfer method

- Total Economic Value (TEV) of good G is:

Approach I:

$$\text{TEV}(G) = \text{TEV}(g_1) + \text{TEV}(g_2) + \dots + \text{TEV}(g_n).$$

Approach II:

$$\text{TEV}(I(G)) = \text{TEV}(I(g_1)) + \text{TEV}(I(g_2)) + \dots + \text{TEV}(I(g_n)).$$

- Values were converted to unite currency using purchasing power parity (ppp).
Values were recalculated to take into account inflation by using consumer price index, (CPI).

Value of ecosystem services provided by the Park in Wilanów



	Park	Park and Morysin
I. Provision of raw materials		
II. Regulation of natural processes		
III. Cultural functions		
Total		

Provisioning services (*in-situ* study)

- The Park could, for example, produce hay from grass, or sell timber from woodlands or fish from ponds, but it does not.
- According to the information from the Museum in Wilanów, the only product of that sort is compost made from grass and other organic residues.
- The annual production of compost in the Park is 625 m³ (350 tons).
- Taking the market price of compost at 15 euro / ton yields the value of 5,250 euro.

Regulating services (BT - approach I)

- We reviewed numerous studies carried out in objects similar in terms of ecosystems to the Park in Wilanów.
- On this basis, we estimated the value of regulating services provided by:
 - grasslands at the level of 3,100 euro / ha
 - woodlands at the level of 3,200 euro / ha
 - ponds at the level of 8,900 euro / ha
- Taking into account the areas of these ecosystems, the total value of regulating services provided by the Park is 320,000 euro annually (41,000-546,000 euro)
- If Morysin is included, the total value increases by 135,000 euro.

Regulating services (BT - approach II)

- An alternative approach, based on a detailed inventory of more than 3,000 trees in the Park.
- Taking into account the estimates of external cost of air pollution from many European projects (e.g., NEEDS 2008), we estimated an average annual benefit provided by a tree in Wilanów at 20 euro.
- In total: 60,000 euro for the Park per annum.
- The per tree benefits may be overestimated.

Cultural services

- Stated preference surveys could provide precise value estimates.
- Alternatively, a travel cost method could be employed to estimate the demand for visits to the Park, which would reflect the value of cultural services.
- However, we do not have enough data for such an analysis.

Cultural services (BT approach I)

- We thus referred to value estimates from other assessments carried out elsewhere.
- But a direct benefit transfer is not appropriate because the Park in Wilanów is unique and uniquely located.
- The value estimates in the empirical literature range: from 200 euro / ha for open spaces (Troy and Bagstad 2009; De Groot et al. 2012) to 2,000 euro / ha for urban forests (Chen and Jim 2008).
- Hence, roughly, a hectare of the Park provides benefits of 1,000 euro.
- In total, the Park provides benefits of 42,000 euro per annum. Including Morysin doubles this number.

Value of ecosystem services provided by the Park in Wilanów

	Park	Park and Morysin
I. Provision of raw materials	5,250 Euro / year	5,250 Euro / year
II. Regulation of natural processes	320,000 Euro / year	455,000 Euro / year
III. Cultural functions	42,000 Euro / year	83,000 Euro / year
Total	365,250 Euro / year	543,250 Euro / year

Conclusions

	Park	Park and Morysin
Total value of ecosystem services	365,250 Euro / year	543,250 Euro / year

- A large value, but it yields to the historical value of the place.
- In 2013, the subsidy from the state budget for the Museum in Wilanów was 5.75 M euro. This might be referred as an implicit value – what the society pays in order to secure the supply of the good.
- The implicit value is much higher than the value of ecosystem services provided by the Park – the value of historical assets of the Museum is so high that ecosystem services do not dominate over it.

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