Supplementary Material

# Supplementary Tables

Supplementary Table S1. Assessment of the ES generated by the University of Pretoria rain garden

|  |  |
| --- | --- |
| RAIN GARDEN | |
| University of Pretoria rain garden | |
| Source: Dunstan and Sampson (2013); Steenberg (2013). | **Physical location** |
| Pretoria, South Africa |
| **Location within the city** |
| University of Pretoria, Botanicalgarden |
| **Access** |
| Public |
| **Initiated** |
| 2013 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CRITERIA | *Provisioning* | Food supply | *N.A.* | 🗶 |
| **Raw materials** | ***N.A.*** | **🗶** |
| **Fresh water** | The captured water is infiltrated back into the ground, which is then utilised for the irrigation of the botanical garden. The system harvests 17 000*l* water for every 10mm of rain of the 1700m² building. | **✓** |
| **Medicinal resource** | ***N.A.*** | **🗶** |
| ***Regulating*** | **Local climate regulation** | Evapotranspiration reduces energy usage and mitigating the urban heat island. | **✓** |
| **Air Purification** | On a small scale provides local air purification through the vegetation, tree cover acts as carbon storages. | **✓** |
| **Moderation of Extremes** | On a small scale prevents storm water flooding by capturing the storm water of the already overloaded storm water infrastructure. | **✓** |
| **Waste-water treatment** | Serves as a rainwater harvesting and water treatment plant for the botanical garden. Water is filtered and circulated thought the plants in the garden. | **✓** |
| ***Cultural*** | **Recreation and cognitive development** | The created ecosystem serves as a “living laboratory” for students to research the wetland habitat. It also provides the opportunity to safeguard some plant species utilised for horticultural research. | **✓** |
| **Aesthetic contributions** | A previously degraded and unused space around the building is created into a visually and intellectually stimulating green space. | **✓** |
| **Spiritual experience and sense of place** | ***N.A.*** | **🗶** |
| **Tourism** | The space was created to attract visitors and has especially became a favourite attraction for students | **✓** |
| ***Habitat & supporting*** | **Habitats for species** | By softening the hard lines of the building with green resources created a habitat for fish, insects and amphibians. All trees found on the site were incorporated into the design. | **✓** |
| **Genetic diversity** | Host approximately 145 aquatic and terrestrial plant species | **✓** |

**Source:** BasedonDunstan and Sampson (2013); Steenberg (2013)**.**

**Supplementary Table S2. Summary of the “provision capacity” or the total ES generated by each example in terms of GI elements.**

| **GI ELEMENTS** | | | **ECOSYSTEM SERVICES** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PROVISIONING** | | | | | | | | | | | | | | | | | | | | | **REGULATING** | | | | | | | | | | | | | | | | **CULTURAL** | | | | | | | | | | | | | | | | **HABITAT** | | |
| Food supply | Raw materials | | | | | | | | | Fresh water | Medicinal resources | | | | | | | | | | Local climate regulation | | | | Air Purification | | | | Moderation of Environmental | | | | Waste-water treatment | | | | Recreation and Cognitive Development | | | | | Aesthetical | | | | Religion, spiritual and symbolism | | | | Tourism | | | Habitats for species | | Maintenance of genetic diversity |
| **TABLE KEY:** | | | | | | | | | | | | | | | | | | | **● Generated by the element** | | | | | | | | | | | | | | | | | | | | | | **Not generated the element** | | | | | | | | | | | | | | | | | |
| GREY-GREEN DESIGNED ELEMENTS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Green roof | | | ● | | | | | ● | | | |  | | | | | | ● | | | | | ● | | | | ● | | | | ● | | | | ● | | | | ● | | | | | ● | | | | ● | | | | ● | | | ● | | ● | |
| Green wall | | |  | | | | |  | | | |  | | | | | |  | | | | | ● | | | | ● | | | |  | | | |  | | | | ● | | | | | ● | | | | ● | | | | ● | | | ● | | ● | |
| Sustainable urban drainage systems (constructed wetland) | | |  | | | | |  | | | | ● | | | | | |  | | | | | ● | | | | ● | | | | ● | | | | ● | | | | ● | | | | | ● | | | | ● | | | | ● | | | ● | | ● | |
| Sustainable urban drainage systems (rain garden) | | |  | | | | |  | | | | ● | | | | | |  | | | | | ● | | | | ● | | | | ● | | | | ● | | | | ● | | | | | ● | | | |  | | | | ● | | | ● | | ● | |
| **URBAN AGRICULTURE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Community garden | ● | | | |  | | | |  | | | | | | ● | | | | | ● | | | | | ● | | | |  | | | |  | | | | ● | | | | |  | | | | ● | | | | ● | | | | ● | | |  | |
| Rooftop farming | ● | | | | ● | | | |  | | | | | | ● | | | | | ● | | | | | ● | | | | ● | | | | ● | | | | ● | | | | | ● | | | | ● | | | | ● | | | | ● | | | ● | |
| Horticulture | ● | | | |  | | | |  | | | | | | ● | | | | | ● | | | | | ● | | | | ● | | | | ● | | | | ● | | | | | ● | | | | ● | | | |  | | | | ● | | |  | |
| **URBAN NATURAL REMNANTS** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urban forest | | ● | | | | |  | | | |  | | | | | | ● | | | | | ● | | | | | ● | | | | ● | | | | ● | | | | ● | | | | | ● | | | | ● | | | | ● | | | ● | | ● | |
| Existing or remnant natural areas | |  | | | | |  | | | |  | | | | | |  | | | | | ● | | | | | ● | | | | ● | | | | ● | | | | ● | | | | | ● | | | | ● | | | | ● | | | ● | | ● | |
| Urban wetland | | ● | | | | | ● | | | | ● | | | | | | ● | | | | | ● | | | | | ● | | | | ● | | | | ● | | | | ● | | | | | ● | | | | ● | | | | ● | | | ● | | ● | |
| Urban river or stream | |  | | | | |  | | | | ● | | | | | |  | | | | | ● | | | | | ● | | | | ● | | | | ● | | | | ● | | | | | ● | | | | ● | | | | ● | | | ● | | ● | |
| **PUBLIC GREEN SPACE** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urban park and child-friendly space | |  | | | | |  | | | | ● | | | | | |  | | | | | ● | | | | | ● | | | |  | | | | ● | | | | ● | | | | | ● | | | | ● | | | | ● | | | ● | | ● | |
| Botanical garden | |  | | | | |  | | | | ● | | | | | | ● | | | | | ● | | | | | ● | | | | ● | | | |  | | | | ● | | | | | ● | | | | ● | | | | ● | | | ● | | ● | |
| Green sport facilities | |  | | | | |  | | | | ● | | | | | |  | | | | | ● | | | | | ● | | | | ● | | | |  | | | | ● | | | | | ● | | | |  | | | | ● | | |  | | ● | |
| Health clinic garden | | ● | | | | | ● | | | |  | | | | | | ● | | | | | ● | | | | | ● | | | |  | | | |  | | | | ● | | | | | ● | | | | ● | | | |  | | | ● | | ● | |
| **PRIVATE GREEN SPACES** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Private home gardens | ● | | | | | ● | | | |  | | | | | | ● | | | | | ● | | | | | ● | | | | ● | | | |  | | | | ● | | | | | ● | | | | ● | | | |  | | | | ● | | ● | |
| **INFORMAL GREEN SPACES** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Riverbank greenery |  | | | | | ● | | | | | ● | | | | | | ● | | | | | ● | | | | | ● | | | | ● | | | | ● | | | | ● | | | | | ● | | | | ● | | | | ● | | | ● | | ● | |
| Roadside or railway verged greenery |  | | | | |  | | | | |  | | | | | |  | | | | |  | | | | |  | | | | ● | | | |  | | | |  | | | | | ● | | | |  | | | |  | | | ● | | ● | |
| Vacant land |  | | | | |  | | | | |  | | | | | |  | | | | | ● | | | | | ● | | | | ● | | | | ● | | | |  | | | | |  | | | |  | | | |  | | |  | |  | |

# References

Dunstan and Sampson (2013). Landscape SA: Rainwater Harvesting At Pretoria University. <https://www.up.ac.za/media/shared/491/rhg-landscape-sa.zp56039.pdf>. [Accessed August 25, 2020].

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