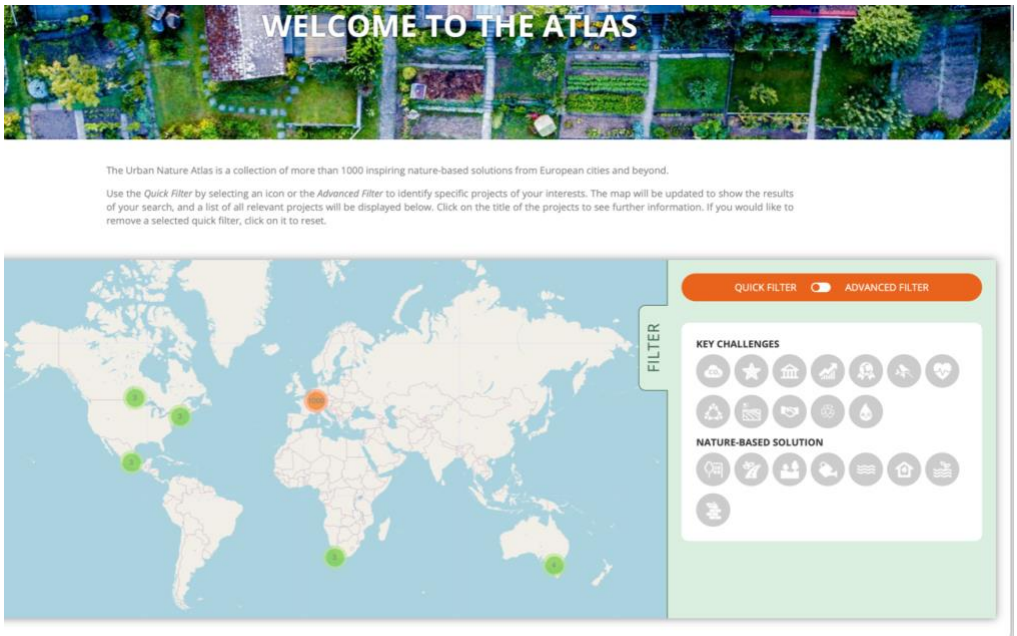
Understanding of the Multiple Benefits of Urban Nature in Practice: Insights from the Urban Nature Atlas

Technical report supporting the PBL publication: Enhancing Urban Nature Provision in the Netherlands



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Aim of the Analysis:

- Provide insight into urban NBS[1] initiatives in Europe that address societal challenges and deliver multiple benefits related to biodiversity, health, climate adaptation and economic development.
- Provide a better understanding of how multiple benefits are realized in NBS initiatives.

Data Scope:

We use the Urban Nature Atlas (hereby referred to as the UNA) to carry out the analysis. The UNA is a database of NBS projects in Europe and beyond. The following analysis is based on the analysis of 1000 NBS interventions available in the UNA, collected across 100 European cities (during the course of the Naturvation project).

Figure 1. European cities included in the Urban Nature Atlas.

Specifically, this report focuses on European NBS projects that aim to address the challenges of climate change adaptation, biodiversity protection, health and economic development. In addition, it also examines how NBS projects contribute to social development.

[1] NBS refers to the term Nature-Based Solutions.

Research Questions:
We studied the following questions via quantitative, statistical analysis:

Q1: How many of the UNA initiatives can be linked to challenges that are related to biodiversity, health, climate adaptation, economic development, in addition to social goals?

Q2: What is the distribution of these initiatives among the objectives and the impacts?

- Evaluation of additional challenges they are likely to address, with a specific focus on the type of social challenges they aim to target
- Spatial scale
- Types of NBS
- Implementation focus (also distinguishing whether it is a physical or discursive initiative)
- Beneficiaries of the project/benefits
- Additional project impacts, with a specific focus on the type of social results they deliver

Q3: What is the financial size and composition of these initiatives (distribution)?

- Financial scale
- Funding bodies
- Financial sources
- Non-financial contributions

Q4: What actors are involved in these initiatives? (typological division)

- Management set-up (government-led, non-government or hybrid; under non-government actors we will look at the role of private organisations and NGOs separately)
- Initiator of project implementation
- Stakeholders involved
- Types of stakeholder processes
- Business models that drive the implementation (based on Naturvation categorisation)

Q5: What can be revealed about the drivers behind implementation?

- Whether the project was a voluntary or mandatory initiative?
- Whether the project was a result of EU/national/local policy
- What type of local policy; transnational cooperation; research project; financial incentives supported the implementation of the NBS
- Whether the projects have monitoring and evaluation activities?

Q6: What do we know about high-impact cases (i.e. delivering benefits in all four areas) in order to better understand how NBS directly lead to multiple benefits?

We will select those cases that delivered impacts in all four analyses and attempt to identify the factors that make them more likely to deliver these impacts.

- Do high-impact cases have underlying goals to support the implementation?
- What are the implementation features that characterise these cases?
- What are the governance factors that that characterise these cases?
- What are some of the examples of high-impact cases?

Methodology:

- Statistical analysis of variations (since the four-goal sample is relatively small and may cause outlier results, the analysis was also performed for projects which are addressing at least three goals.
- Correlation analysis and linear analysis to test the relevance/sensitivity analysis of the results.

Q1: How many of the UNA initiatives can be linked to challenges related to biodiversity, health, climate adaptation, economic development and social goals?

In this section, we provide an overview of the projects that aim to address these challenges and/or provide related benefits in the selected UNA initiatives. The primary focus of our analysis are the projects that provide multiple benefits related to biodiversity, health, climate adaptation and economic development. In addition, we will also consider projects that address social goals.

1.1. Definition of sustainability goals and impacts

The UNA contains data that interprets the most common challenges that NBS are usually employed to address. In addition, it allows for the understanding of the assessed or expected impacts of such projects.

Based on the work of the EKLIPSE Expert Working Group on Nature-based Solutions to Promote Climate Resilience in Urban Areas[2] and United Nations Sustainable Development Goals (UN SDG), the UNA distinguishes 12 challenge areas that NBS have the potential to address. These include the following challenges:

- Climate action for adaptation, resilience and mitigation (SDG 13, *SDG 7*)
- Water management (SDG 6)
- Coastal resilience and marine protection (SDG 14)
- Green space, habitats and biodiversity (SDG 15)
- Environmental quality, including air quality and waste management
- Regeneration, land-use and urban development
- Inclusive and effective governance (SDG 16)
- Social justice, cohesion and equity (SDG 10, *SDG 5, SDG1)*
- Health and well-being (SDG 3)
- Economic development and decent employment (SDG 8)
- Cultural heritage and cultural diversity
- Sustainable Consumption and Production (SDG 12)

Under each challenge area, the UNA identifies 2-6 goals that NBS projects are able to address. For the purposes of this report, we defined a set of sustainability goals and resulting impacts relevant to the challenges of climate change adaptation, biodiversity protection, health and well-being, economic development and social issues (See Table 1).

[2] Raymond et al. (2017) A framework for assessing and implementing the co-benefits of nature-based solutions in urban areas, Environmental Science & Policy, Volume 77, p. 15-24.

Table 1. Description of NBS goals and impacts assessed in this report.

Challenge areas	Goals	Impacts
Climate Change Adaptation	• Climate change adaptation • Flood protection • Storm and rainfall water management and storage • Coastal protection	• Increased protection against sea level rise • Lowered local temperature • Strengthened capacity to address climate hazards/natural disasters • Increased protection against flooding • Improved stormwater management • Reduced risk of damages by drought • Enhanced protection and restoration of coastal and marine ecosystems • Enhanced protection and restoration of freshwater ecosystems
Biodiversity protection	• Biodiversity conservation • Biodiversity restoration • Marine and biodiversity protection	• Enhanced protection and restoration of coastal and marine ecosystems • Enhanced protection and restoration of freshwater ecosystems • Increase in protected green space areas • Increased conservation or restoration of ecosystems • Increased ecological connectivity across regeneration sites and scales • Reduced biodiversity loss • Increased number of species present • Increased protection of threatened species • Improved prevention or control of invasive alien species • Enhanced support of pollination • Increased spread of native/heirloom/open-pollinated seed • Prevent or control invasive alien species
Health	• Enabling physical activity • Improving mental health • Improving physical health • Creation of opportunities for relaxation and recreation • Air qual improvement • Noise reduction	• Improved physical health • Improved mental health • Gain in activities for recreation and exercise • Improved air quality • Reduced noise exposure
Economic development	• Economic development: agriculture • Economic development: industry • Economic development: service sectors • Tourism support • Real estate development • Employment / job creation	• Increase in GDP • Increase of jobs • More sustainable tourism • Increased property prices • Stimulate development in deprived areas • Reduce financial cost for urban management • Increase in agricultural production (for profit or not) • Attraction of business and investment • Generation of income from NBS • Increased market share for green economies
Social issues	• Inclusive governance • Environmental education • Social justice and equity • Environmental and climate justice • Social cohesion • Social interaction • Preserve natural heritage • Protect the area's historic and cultural landscape / infrastructure • Promotion of cultural diversity • Preserve historical traditions	• Increased opportunities for social interaction • Improved social cohesion • Fair distribution of social, environmental and economic benefits of the NBS project • Improvement of liveability • Improved access to urban green space • Increased visibility and opportunity for marginalized groups or indigenous peoples • Promotion of cultural diversity • Improvement in people’s connection to nature • Protection of natural heritage • Protection of historic and cultural landscape / infrastructure • Preserved spiritual and religious values • Increased sense of place identity, memory and belonging • Increased awareness of flora and fauna as culturally and historically meaningful • Increased appreciation for natural spaces

1.2. Sustainability goals addressed by the NBS projects presented in the UNA

Based on the description of sustainability challenges defined for the purpose of this project, the most common goals identified by the 1000 European projects are health goals (73% of the total number of projects), followed by biodiversity goals (47%), climate change adaptation (44%), and lastly, economic development goals (28%). To complement this analysis, social issues (e.g. social justice and cohesion) was also studied, and it was found in 60% of the total number of projects (See Figure 2).

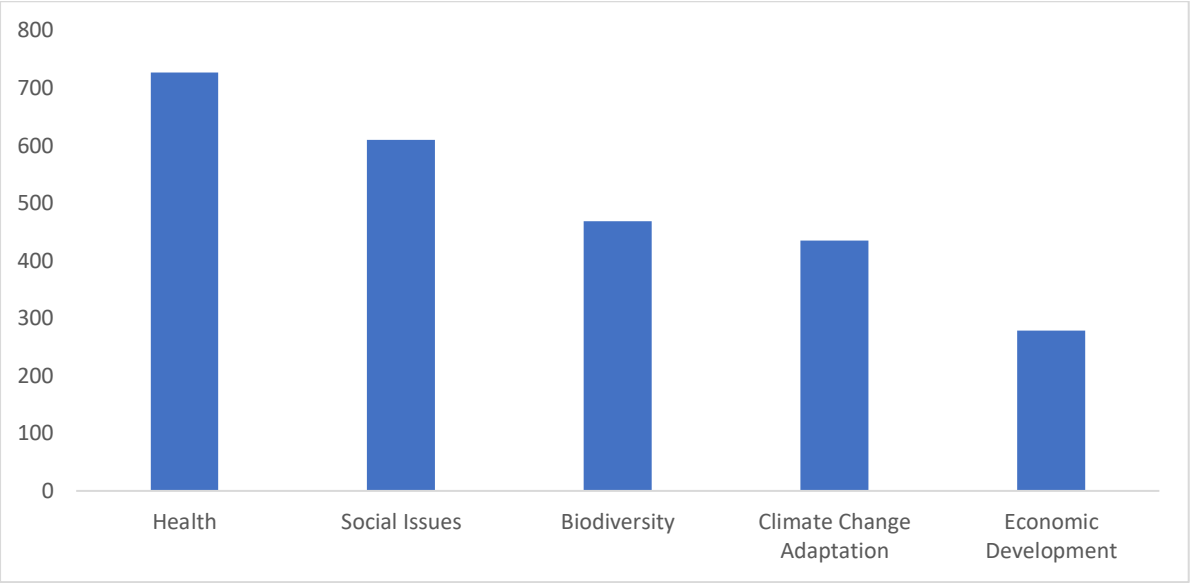


Figure 2. Sustainability goals addressed by 1000 European NBS projects.

From the European sample of 1000 NBS projects, across the categories of climate change adaptation, biodiversity, health, economic development and social justice, 309 NBS projects addressed at least 3 of these challenges, 134 NBS projects addressed 4 goals, and only 45 NBS projects addressed all five goals.

Focusing only on projects that addressed climate change adaptation, biodiversity, health, economic development, 197 addressed three goals, and 57 NBS projects addressed these four goals. When investigating the most common combinations of these goals, the combination most often found is “climate change, biodiversity and health” (151 NBS projects), followed by “climate change, health and economic development (106 NBS projects), and “biodiversity, health and economic development” (103 NBS). The least common combination is “climate change, biodiversity and economic development” (65 NBS) (Table 2).

Table 2: Sustainability goal combinations and number of projects addressing these goals

	Climate Change Adaptation	Biodiversity protection	Health	Economic development	Number of projects
4 goals	x	x	x	x	57
Combination of 3 goals	x	x	x		151

Combination of 3 goals	x		x	x	106
Combination of 3 goals		x	x	x	103
Combination of 3 goals	x	x		x	65

1.3. Impacts delivered by the NBS projects included in the UNA

Regarding the impacts of the European NBS projects collected in the UNA, the impacts across environmental, economic and socio-cultural categories represent reported impacts that have been achieved or expected impacts.

Across the same sustainability challenge categories described so far in this report (Table 1), the most commonly recorded impacts are biodiversity-related impacts (73% of the total number of projects), followed closely by impacts related with social justice and cohesion (72%). Health impacts were also found in over half of the projects (69%). Climate change impacts were found in a significant number of projects (48%), and lastly, impacts related with economic development were found to a lesser extent (42%) (Figure 2).

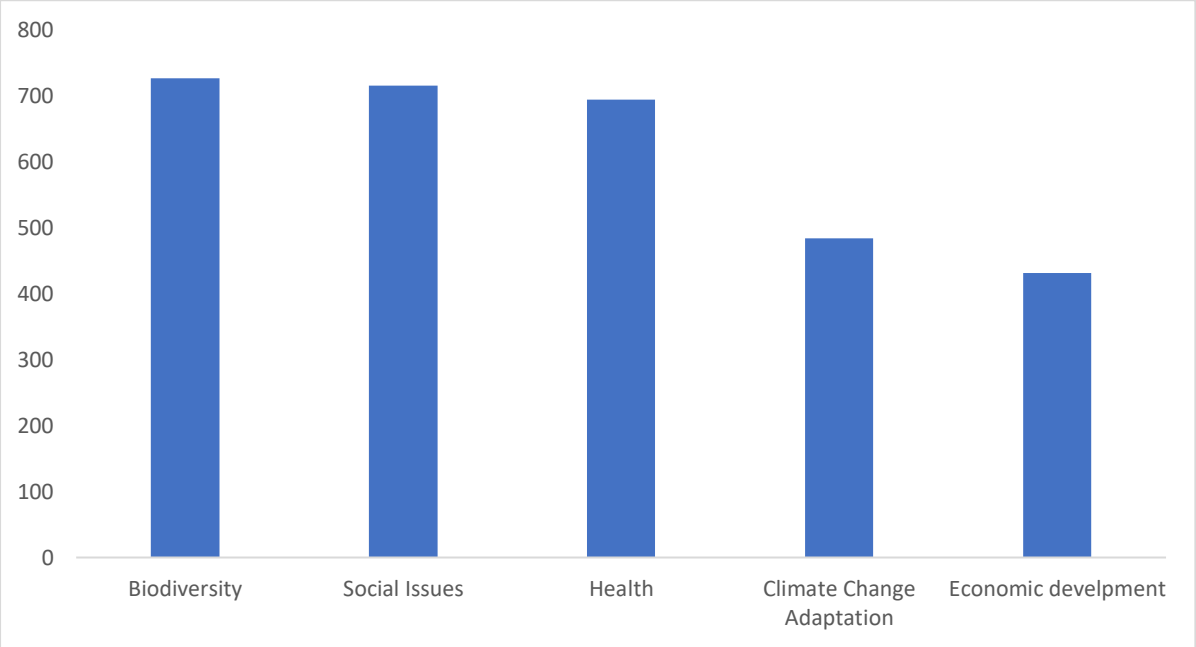


Figure 3. Impacts delivered by 1000 European NBS projects.

In the studied NBS projects, across the impact categories of climate change, biodiversity, health, economic development and social justice, 115 NBS projects delivered impacts across these five categories. A larger sample of projects –284– addressed impacts across four impact categories. In total, 684 projects delivered impacts in at least three impact categories.

Focusing only on projects that delivered impacts across the categories of climate change, biodiversity, health, economic development, 330 NBS delivered impacts at least in three of the categories, and 134 NBS projects reported impacts within these four categories. When investigating the most commonly identified impacts, similarly to the goals analysis, the combination of “climate change, biodiversity and health”

impacts is the most common (274 NBS projects), followed by “biodiversity, health and economic development” (248 NBS) (Table 3).

Table 3: Impact combinations and number of projects reporting these impacts.

	Climate Change Adaptation	Biodiversity protection	Health	Economic development	Number of projects
4 impacts	x	x	x	x	134
Combination of 3 impacts	x	x	x		274
Combination of 3 impacts	x		x	x	174
Combination of 3 impacts		x	x	x	248
Combination of 3 impacts	x	x		x	170

1.4. Analysis of the studied sustainability goals and impacts

A detailed overview of how European NBS projects address the studied sustainability challenges individually, is presented below.

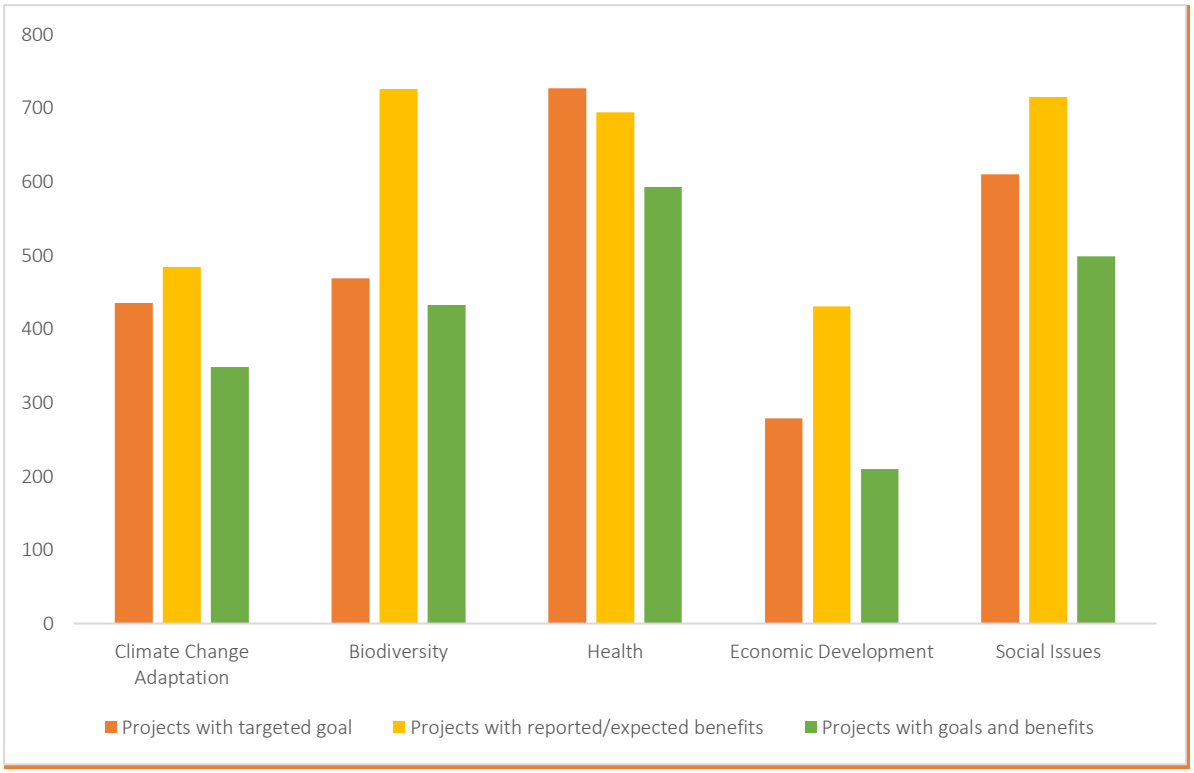


Figure 4: Overview of NBS projects addressing relevant sustainability goals and reporting benefits.

Climate change adaptation:

- In total 435 projects identified climate change as a goal driving the NBS project implementation (Table 4);
- 484 reported impacts related with climate change (Table 5);
- A total of 384 projects reported both goals and impacts related to climate change;

Table 4. Climate change goals addressed in the European NBS projects included in the UNA

Goals	**Number of projects**
Total: Climate change	**435**
Storm and rainfall water management and storage	266
Climate change adaptation	214
Flood protection	188
Coastal protection	30

Table 5. Climate change adaptation impacts reported by the European NBS projects included in the UNA

Impacts	**Number of projects**
TOTAL: Climate change	**484**
Improved stormwater management	224
Increased protection against flooding	198
Lowered local temperature	172
Strengthened capacity to address climate hazards/natural disasters	109
Enhanced protection and restoration of freshwater ecosystems	86
Enhanced protection and restoration of coastal and marine ecosystems	28
Reduced risk of damages by drought	18
Increased protection against sea level rise	6

Biodiversity protection:

- In total 469 projects identified biodiversity-related goals driving the NBS project implementation forward (Table 6);
- 726 reported impacts were related to biodiversity (much more than the number of identified goals) (Table 7), a much higher number of projects than the number of projects that reported biodiversity being a goal to begin with;
- A total of 433 reported both goals and impacts related to biodiversity;

Table 6. Biodiversity goals addressed in the European NBS projects included in the UNA.

Goals	**Number of projects**
Total: Biodiversity	**469**
Habitats and biodiversity conservation	311
Habitats and biodiversity restoration	277
Marine and biodiversity protection	15

Table 7. Biodiversity impacts reported by the European NBS projects included in the UNA.

Impacts	**Number of projects**
TOTAL: Biodiversity	**726**
Increased number of species present	434
Increased conservation or restoration of ecosystems (local habitats for local species)	304
Reduction of biodiversity loss	286
Increased ecological connectivity across regeneration sites and scales	156
Enhanced support of pollination	119
Increase in protected green space areas	117
Increased protection of threatened species	93
Enhanced protection and restoration of freshwater ecosystems	86
Increased spread of native/heirloom/open-pollinated seed	61
Prevent or control invasive alien species	58
Enhanced protection and restoration of coastal and marine ecosystems	28

Health & well-being:

- In total 727 projects identified that health and well-being was a goal that drove the NBS project implementation (Table 8);
- 694 reported impacts related with health (Table 9)
- A total of 593 projects reported both goals and impacts related with health and well-being- the highest number of the five goal categories under analysis;

Table 8. Health goals addressed in the European NBS projects included in the UNA.

Goals	**Number of projects**
Total: Health	**727**
Creation of opportunities for recreation	591
Enabling physical activity	278
Air quality improvement	233
Improving mental health	112
Improving physical health	105
Noise reduction	79

Table 9. Health impacts reported by the European NBS projects included in the UNA.

Impacts	**Number of projects**
TOTAL: Health and wellbeing	**694**
Gain in activities for recreation and exercise	547
Improved air quality	226
Improved physical health	164
Improved mental health	134
Reduced noise exposure	82

Economic development

- In total 279 projects identified economic development as one of the goals of the NBS project (Table 10);
- 431 reported impacts related to economic development, showing that there was an increase in the number of projects that addressed economic development without having the explicit goal to initially (Table 11);
- A total of 210 reported both goals and impacts related with economic development – the lowest number of the five goal categories under analysis;

Table 10. Economic development goals addressed in the European NBS projects included in the UNA.

Goals	**Number of projects**
Total: Economic Development	**279**
Tourism support	101
Real estate development	82
Economic development: agriculture	77
Employment / job creation	60
Economic development: service sectors	48
Economic development: industry	17

Table 11. Economic development impacts reported by the European NBS projects included in the UNA.

Impacts	**Number of projects**
TOTAL: Economic Impacts	**431**
Increase in agricultural production (for profit or not)	113
Increase of jobs	102
Attraction of business and investment	98
More sustainable tourism	82
Other	71
Stimulate development in deprived areas	58
Reduce financial cost for urban management	56
Generation of income from NBS	55
Increased property prices	27
Increased market share for green economies	24
Increase in GDP	5

Social issues:

- In total 610 projects identified social goals of the NBS project (Table 12);
- 715 reported impacts related with social issues, an increase in comparison with the number of projects that aimed to address this topic (Table 13);
- A total of 499 reported both goals and impacts related with social issues- one of the highest number of the five goal categories under analysis;

Table 12. Social goals addressed in the European NBS projects included in the UNA.

Goals	Number of projects
Total: Social issues	**610**
Social interaction	298
Environmental education	246
Social cohesion	183
Preserve natural heritage	176
Protection of historic and cultural heritage	176
Inclusive governance	125
Social justice and equity	82
Preserve historical traditions	51
Promotion of cultural diversity	46
Environmental and climate justice	41

Table 13. Social impacts reported by the European NBS projects included in the UNA.

Impacts	Number of projects
TOTAL: Social issues	**715**
Improved access to urban green space	448
Increased opportunities for social interaction	337
Improvement in people's connection to nature	203
Improved social cohesion	197
Improvement of liveability	157
Protection of historic and cultural landscape / infrastructure	149
Increased appreciation for natural spaces	140
Protection of natural heritage	113
Increased visibility and opportunity for marginalized groups or indigenous peoples	99
Increased sense of place identity, memory and belonging	98
Fair distribution of social, environmental and economic benefits of the NBS project	84
Increased awareness of flora and fauna as culturally and historically meaningful	78
Promotion of cultural diversity	64
Preserved spiritual and religious values	10

Q2: What is the distribution of these initiatives among the studied objectives and the impacts?

In the subsequent analysis we will focus on European projects included in the UNA that either set goals and/or delivered relevant impacts in the areas of climate change adaptation, biodiversity protection, health and well-being, and economic development (hereinafter referred as studied goals/impacts). In addition, we will also consider the potential of these projects to address social issues.

In this section, we analyse the distribution of the objectives and the impacts within the projects, as well as their distribution according to the following categories:

- Any additional challenges they are likely to address, with a specific focus on the type of social challenges they aim to address
- Spatial scale
- Implemented NBS types
- Implementation focus (also distinguishing whether it is a physical or discursive initiative)
- Beneficiaries of the project/benefits
- Additional project impacts, with a specific focus on the type of social results they deliver

2.1. Additional challenges addressed by the studied initiatives

The analysis of the 1000 European NBS projects suggests that NBS are usually designed to address multiple challenges. Almost all the 1000 projects addressed some type of environmental challenge (e.g. green space creation or environmental quality improvements). More than 800 projects (80% of all studied projects) aimed to address some type of social issues while 42% (418 projects) targeted economic challenges with NBS implementation. As a result, 37.5% of all projects set environmental, social and economic goals simultaneously. For 44.5% of projects both environmental and social goals were established and an additional 4% set environmental and economic goals concurrently.

The number of challenges identified by the 1000 NBS projects ranged from 1-11, with an average of 4.59 goals per NBS project. The studied projects were most likely to tackle 3-6 sustainability challenges on average.

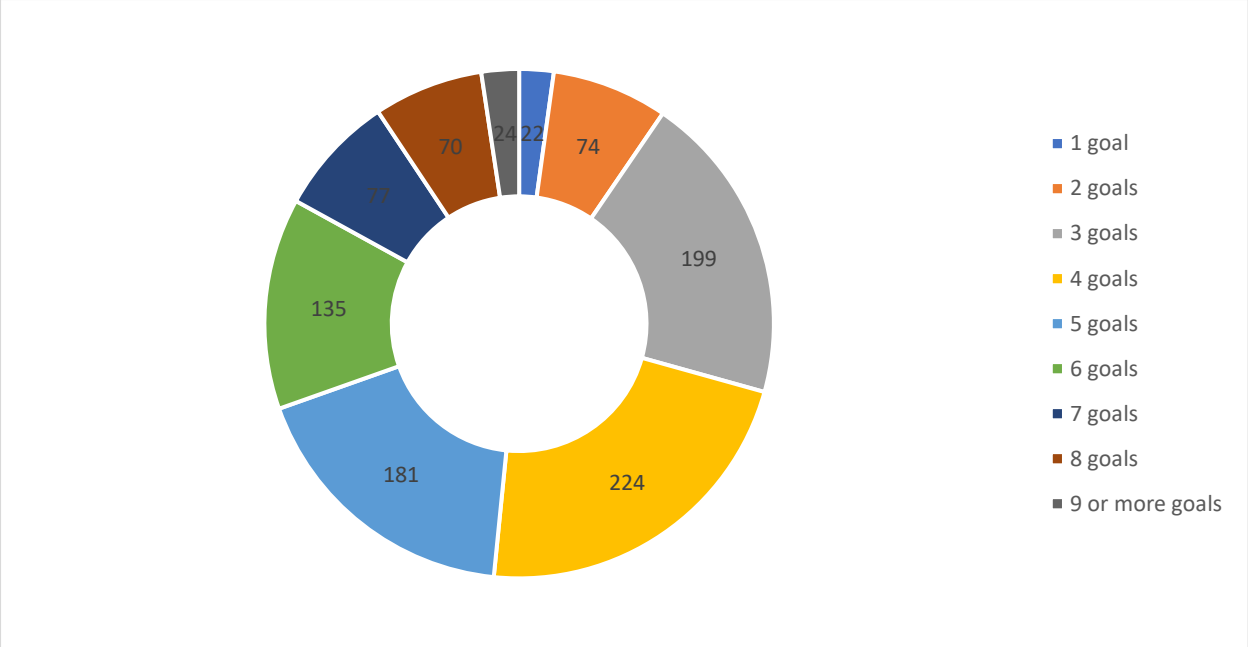


Figure 5. Number of projects addressing sustainability challenges.

Projects aiming to address climate adaptation, biodiversity, health and economic development simultaneously tended to also set additional goals. These included goals related to environmental quality improvements, landscape regeneration, social justice and cohesion, preservation of cultural heritage and diversity as well as sustainable consumption and production.

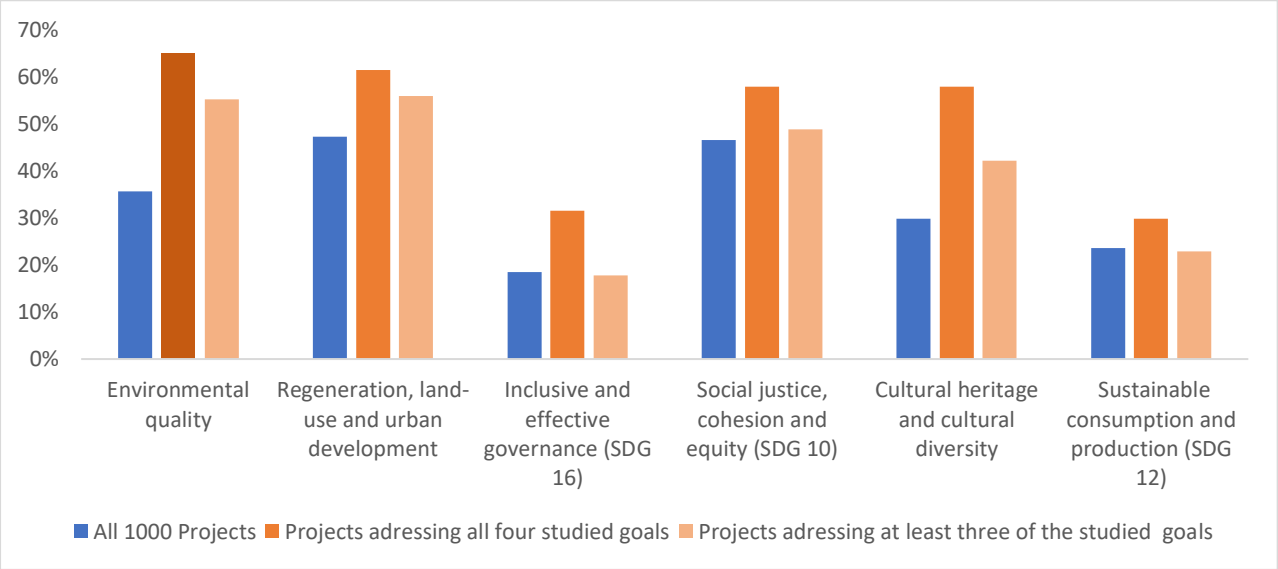


Figure 6. Additional challenge areas addressed by the studied projects.

As a result, projects that addressed at least three challenge areas (of climate adaptation, biodiversity, health and economic development) aimed to achieve goals in two-three additional challenge areas.

Table 14: Average number of addressed sustainability challenge areas.

	Average number of sustainability challenge areas addressed by the UNA projects
All 1000 projects	4.59
Projects addressing at least three of the studied goals	6.16
Projects addressing all four studied goals	7.56

When looking at the specific goals these aimed to achieve, projects which address all four studied goals were most likely to also aim for the following goals:

- Social interaction (39%)
- Preservation of natural heritage (39%)
- Promotion of naturalistic styles of landscape design (37%)
- Protection of historical and cultural landscape / infrastructure (37%)
- Improvements to water quality (37%)
- Climate change mitigation (33%)

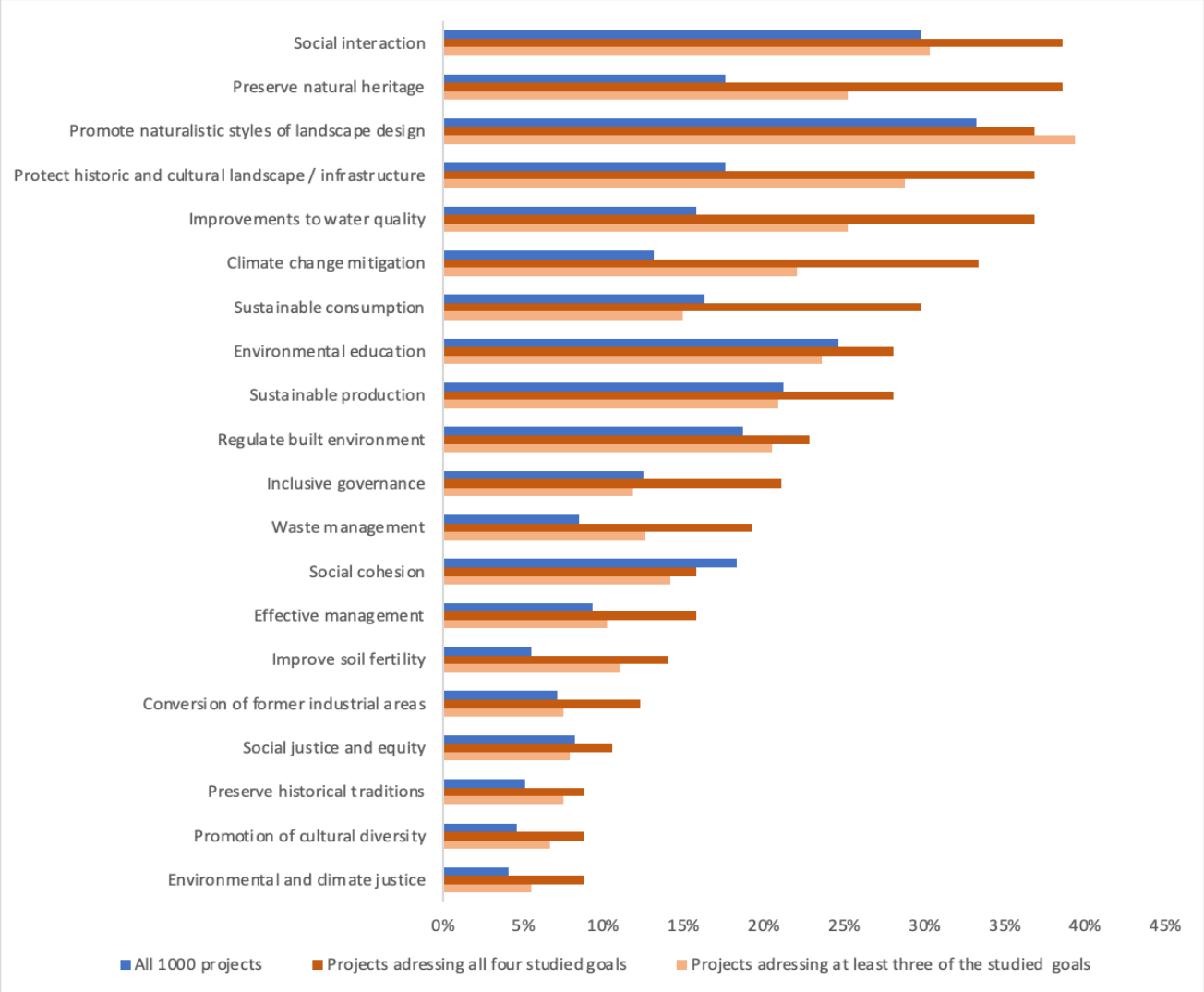


Figure 7.Percentage of projects addressing different sustainability goals (besides climate adaptation, biodiversity protection, health and economic development)

Box 1: Wetland of Repainville (Rouen, France)

Previously used a 10-hectare market gardening site, the restoration of the wetland of Repainville initiated in 2008 is part of a flagship project by the city of Rouen in terms of safeguarding its local biodiversity. Besides having a significant central purpose of protecting and conserving an ecosystem that is particularly rare in urban areas, the project was co-planned around the three critical site functions: conservation of familial and community gardens, environmental education and market gardening. Other important goals of the project include carbon sequestration, improving local air and soil quality, supporting the activity of agricultural economies, the creation of opportunities for recreation and physical activity in natural and biological diverse environments, as well as improving the water quality of the existing ponds and streams.

Source: https://una.city/nbs/rouen/wetland-repainville

The analysis of the different project samples suggests the following:

- **Social justice and cohesion:** Projects with multiple goals (of climate change adaptation, biodiversity, health and economic development) are more probable to aim for additional goals related to social interaction and environmental education, but less likely to address social cohesion. Environmental education goals were prominent when the projects aimed to address biodiversity and economic development-related challenges.
- **Cultural and natural heritage/diversity:** Projects with multiple goals were somewhat more prone to also set goals related to the protection of historical landscapes and the preservation of natural heritage.
- **Governance:** When projects had economic development objectives, they also tended to set goals related to inclusive governance or effective management of NBS more frequently.

Table 15.Social challenges addressed by projects included in the UNA (variation from the overall results)

	TOTAL: Social justice, cohesion and equity (SDG 10)	Environmental education	Social justice and equity	Environmental and climate justice	Social cohesion	Social interaction	**TOTAL: Cultural heritage and cultural diversity**	Preserve natural heritage	Protect the area's historic and cultural landscape / infrastructure	Promotion of cultural diversity	Preserve historical traditions	**TOTAL: Inclusive and effective governance (SDG 16)**	Inclusive governance	Effective management
Climate Change, Biodiversity, Health and Economy	**0.11**	0.03	0.02	0.05	-0.03	0.09	**0.28**	0.21	0.19	0.04	0.04	**0.13**	0.09	0.06
At least three goals	**0.02**	-0.01	0.00	0.01	-0.04	0.01	**0.12**	0.08	0.11	0.02	0.02	**-0.01**	-0.01	0.01
○ Climate Change, Biodiversity And Health	**0.00**	0.01	0.00	0.01	-0.06	0.01	**0.11**	0.07	0.09	0.03	0.02	**-0.01**	-0.01	-0.01
○ Climate Change, Biodiversity and Economy	**0.09**	0.02	0.01	0.05	-0.04	0.06	**0.27**	0.21	0.16	0.03	0.04	**0.09**	0.06	0.05

○ Biodiversity, Health and Economy	**0.17**	0.09	0.02	0.04	0.01	0.08	**0.27**	0.21	0.22	0.01	0.07	**0.11**	0.06	0.07
○ Climate Change, Health and Economy	**0.03**	-0.08	0.01	0.03	-0.04	0.03	**0.17**	0.09	0.14	0.04	0.01	**0.05**	0.04	0.04

2.2. Impact delivery

From the 1000 European NBS projects studied in this analysis, almost all projects reported some type of environmental impact (93%) and social impact (89%), and almost half reported economic impacts (43%). When examining the capacity of NBS projects to deliver impacts across the three categories, 39% of projects reported environmental, social and economic impacts simultaneously. For 86% of projects, both environmental and social impacts were reported, and 42% of projects reported environmental and economic impacts concurrently.

Regarding all types of reported impacts, the number of impact categories identified by the 1000 NBS projects ranged from 1-11, with an average of 4.34 impact categories per NBS project. The studied projects were most likely to tackle 3-7 impacts on average.

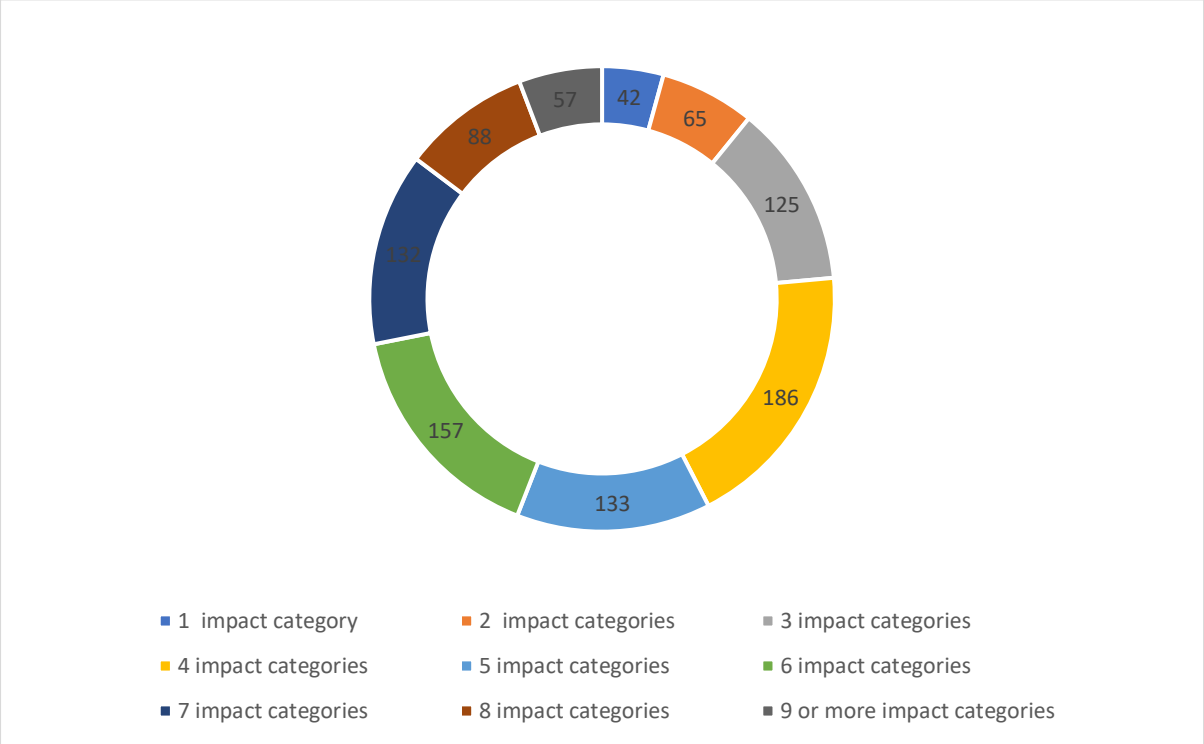


Figure 8. Number of projects delivering impacts.

Besides the study areas in focus in this report (climate adaptation, biodiversity, health and economic development), the NBS projects also delivered impacts in other categories. These included benefits for green space, social justice and cohesion, education, among others (Figure 9).

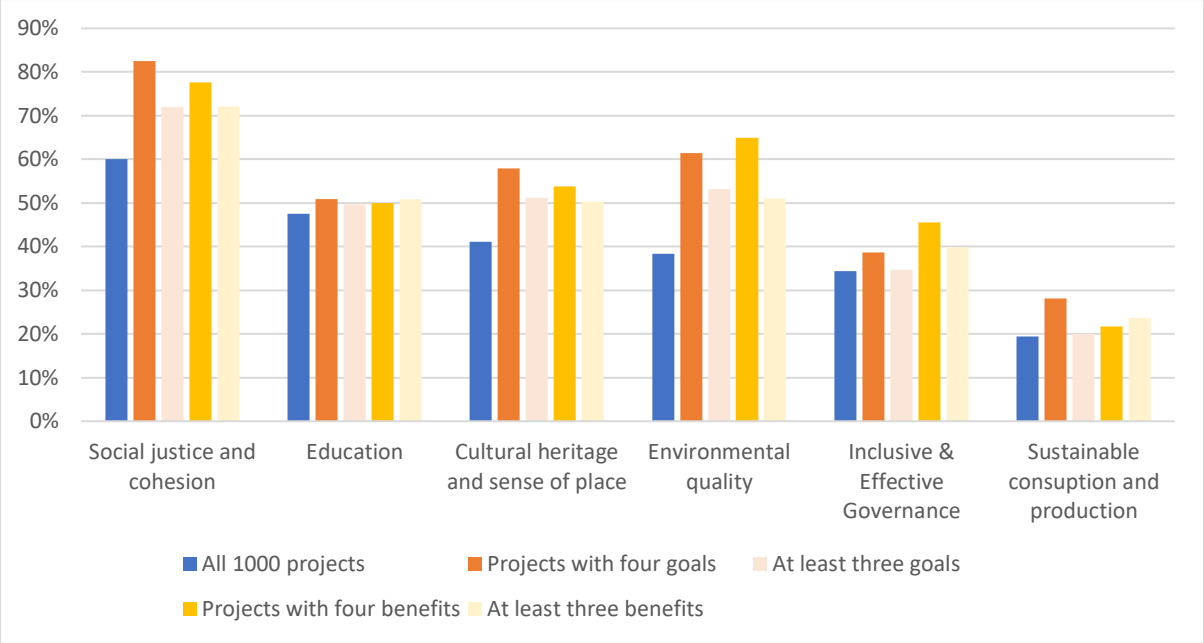


Figure 9. Additional impact categories delivered by the studied projects.

Box 2: Family gardens of Montpellier (Montpellier, France)

Since 2004, the city of Montpellier has placed significant efforts into creating gardening plot areas for local residents within the city ("Les jardins Familiaux"). The gardening plots act as tools for social bonding for intergenerational exchanges, while preserving biodiversity and improving the urban landscape.
In terms of environmental impacts, the project is reported to improve soil quality and waste management by excluding practices with synthetic fertilizers and favoring home composting, improving overall biodiversity loss and creation of new green spaces, as well as the promotion of rainwater collection for gardening processes. Additionally, due to its contribution to increasing agricultural production and access to healthy and affordable food, the gardens are seen as spaces for social interaction among gardeners and a practical example of locals managing urban green spaces. Sustainable agriculture practices and environmental education, in terms of learning and experimenting with sustainable agriculture, is emphasized by all participants, while also being an example of interactive exchanges among gardeners fostering both an ecological and social cohesion experience. Lastly, the gardens are seen as a space that is able to improve people's mental health through connection with nature and improving physical health through gardening exercise and consumption of healthy food products.

Source: https://una.city/nbs/montpellier/family-gardens-montpellier

Regarding the average number of impact categories addressed by the European projects, projects that aimed to address all four studied goals, tended to report a higher average number of impacts across the categories of environmental, economic and social impacts.

Table 16. Average number of impact categories reported.

Average number of environmental impact categories addressed by the UNA projects	
All 1000 projects	1,98
Projects addressing at least three of the studied goals	2,62
Projects addressing all four studied goals	2,89
Average number of economic impact categories addressed by the UNA projects	
All 1000 projects	0,69
Projects addressing at least three of the studied goals	1,14
Projects addressing all four studied goals	1,68
Average number of socio-cultural impact categories addressed by the UNA projects	
All 1000 projects	2,63
Projects addressing at least three of the studied goals	3,05

Projects addressing all four studied goals	3,42

Taking a closer look at the specific impacts that the projects aimed to deliver, those which delivered impacts across all four studied impact categories were most likely to also deliver the following impacts:

- Support education and scientific research (36%)
- Increased knowledge of locals about local nature (31%)
- Improved water quality (28%)
- Increased involvement of locals in the management of green spaces (21%)

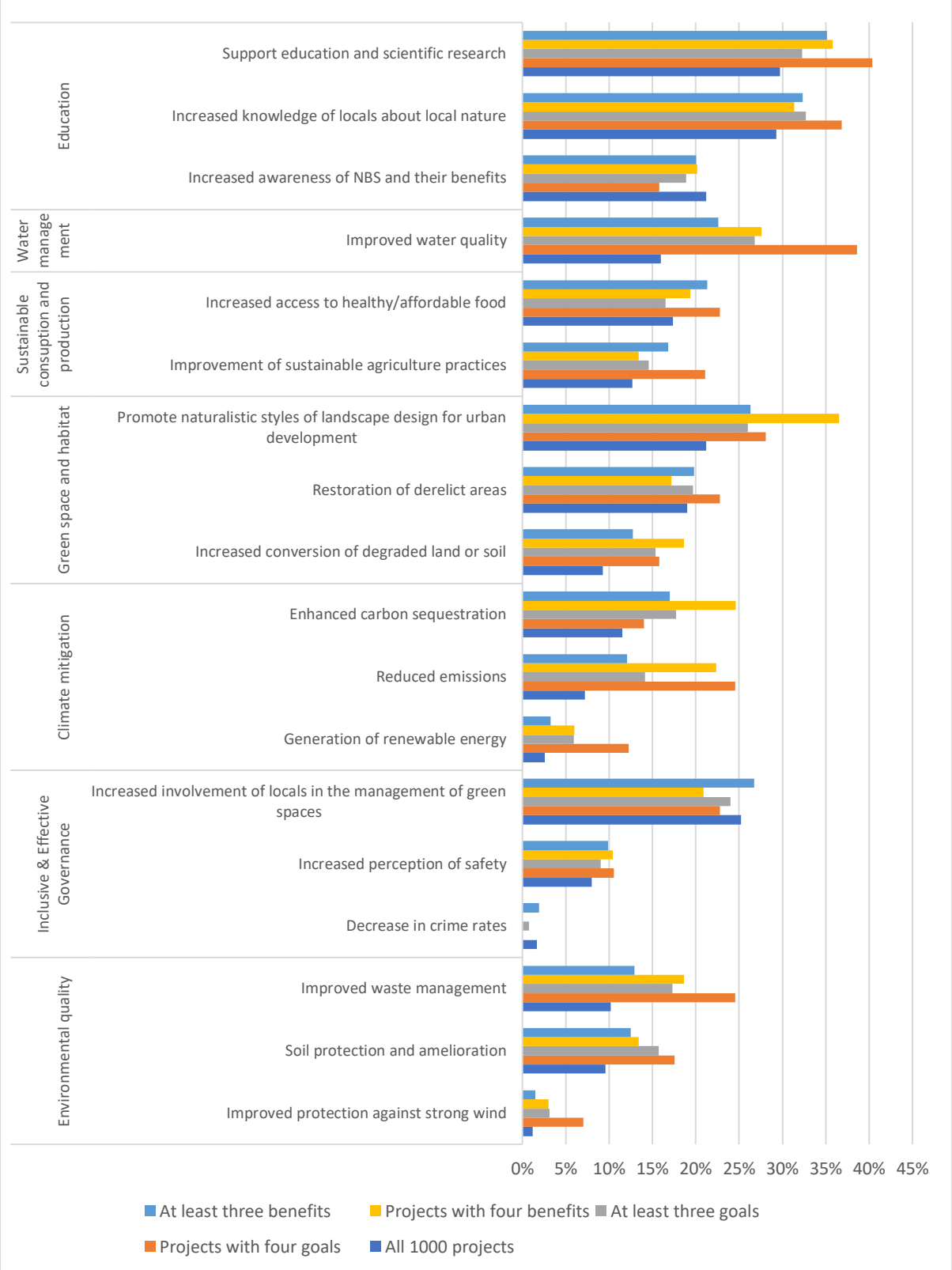


Figure 10. Percentage of projects delivering other impacts (besides climate adaptation and biodiversity protection, health and economic development).

- **Climate change mitigation:** NBS initiatives that set goals and delivered/expected benefits in the areas of climate change adaptation, biodiversity protection, health and economic development, were also more likely to provide climate change mitigation related benefits. These included benefits related to reduced emissions and enhanced carbon sequestration. The analysis suggests that when projects delivered benefits across the four core challenges, they were also more likely to have a carbon sequestration benefit (25% of all such NBS projects).
- **Sustainable Consumption and Production (SCP)**: Projects setting multiple goals for climate change adaptation, biodiversity protection, health and economic development more frequently identify SCP-related objectives, such as improved access to healthy food and improved agricultural practices. However, NBS projects which delivered/expected benefits across multiple challenge areas do not seem to deliver SCP-related benefits more frequently.
- **Cultural heritage and sense of place**: Benefits related with this category are more probably delivered by projects that set multiple goals or expected/delivered benefits in the core challenge areas. Within this category, the most commonly found benefits are the protection of historic and cultural landscape, protection of natural heritage and improvement in people's connection to nature.
- **Education:** Projects that addressed multiple goals and/or delivered benefits across these areas were somewhat more likely to deliver education-related benefits. Such projects somewhat more frequently supported education and research activities and increased knowledge about urban nature for local people.

Table 17. Social impacts delivered by projects addressing multiple goals (variation from the overall results).

	Climate Change, Biodiversity, Health and Economy	Climate Change, Biodiversity, Health, Economy and Social Goals	Projects addressing at least three goals	o Climate Change, Biodiversity And Health	o Climate Change, Biodiversity and Economy	o Biodiversity, Health and Economy	o Climate Change, Health and Economy
TOTAL: Cultural heritage and sense of place	**0,17**	**0,28**	**0,10**	**0,08**	**0,17**	**0,22**	**0,08**
Promotion of cultural diversity	0,09	0,14	0,01	0,02	0,07	0,05	0,07
Improvement in people's connection to nature	0,11	0,13	0,06	0,05	0,09	0,20	0,02
Protection of natural heritage	0,13	0,20	0,08	0,07	0,13	0,14	0,09
Protection of historic and cultural landscape / infrastructure	0,17	0,25	0,08	0,06	0,17	0,17	0,09
Preserved spiritual and religious values	0,03	0,03	0,01	0,01	0,02	0,02	0,01
Increased sense of place identity, memory and belonging	0,11	0,15	0,02	0,03	0,09	0,09	0,06
Increased awareness of flora and fauna as culturally and historically meaningful	0,08	0,12	0,05	0,01	0,08	0,16	0,04
Increased appreciation for natural spaces	0,05	0,06	0,04	0,05	0,04	0,07	0,01
TOTAL: Social justice and cohesion	**0,22**	**0,22**	**0,12**	**0,15**	**0,17**	**0,20**	**0,14**

Increased opportunities for social interaction	0,22	0,22	0,08	0,10	0,19	0,19	0,13
Improved social cohesion	0,05	0,07	0,00	0,01	0,02	0,06	0,00
Fair distribution of social, environmental and economic benefits of the NBS project	0,06	0,07	0,03	0,04	0,04	0,04	0,04
Improvement of liveability	0,25	0,20	0,11	0,13	0,21	0,15	0,19
Improved access to urban green space	0,25	0,24	0,14	0,17	0,20	0,23	0,16
Increased visibility and opportunity for marginalized groups or indigenous peoples	0,04	0,06	0,02	0,01	0,02	0,09	0,00
TOTAL: Inclusive & Effective Governance	**0,04**	**0,06**	**0,00**	**0,03**	**0,03**	**0,06**	**-0,04**
Increased perception of safety	0,03	0,05	0,01	0,02	0,03	0,00	0,02
Decrease in crime rates	-0,02	-0,02	-0,01	-0,01	-0,02	-0,02	-0,01
Increased involvement of locals in the management of green spaces	-0,02	0,01	-0,01	0,00	-0,04	0,05	-0,09
Reduce financial cost for urban management	0,05	0,01	0,00	0,02	0,04	0,02	0,02

Table 18. Social impacts reported in projects delivering multiple impacts - variation from the overall sample.

	Climate Change, Biodiversity, Health and Economy	**Climate Change, Biodiversity, Health, Economy and Social**	**Projects delivering at least three impact categories**	**o Climate Change, Biodiversity And Health**	**o Climate Change, Biodiversity and Economy**	**o Biodiversity, Health and Economy**	**o Climate Change, Health and Economy**
TOTAL: Cultural heritage and sense of place	0,13	0,22	0,09	0,10	0,08	0,15	0,08
Promotion of cultural diversity	0,05	0,07	0,03	0,02	0,04	0,05	0,06
Improvement in people's connection to nature	0,16	0,21	0,08	0,09	0,09	0,16	0,11
Protection of natural heritage	0,04	0,07	0,04	0,05	0,05	0,05	0,01
Protection of historic and cultural landscape / infrastructure	0,07	0,11	0,06	0,07	0,07	0,07	0,04
Preserved spiritual and religious values	0,01	0,02	0,01	0,01	0,01	0,01	0,01
Increased sense of place identity, memory and belonging	0,07	0,09	0,02	0,02	0,04	0,08	0,05
Increased awareness of flora and fauna as culturally and historically meaningful	0,06	0,08	0,02	0,02	0,04	0,07	0,03
Increased appreciation for natural spaces	0,13	0,17	0,04	0,09	0,08	0,07	0,08
TOTAL: Social justice and cohesion	0,18	0,30	0,12	0,11	0,10	0,20	0,17
Increased opportunities for social interaction	0,13	0,20	0,07	0,04	0,07	0,14	0,14
Improved social cohesion	0,07	0,12	0,04	0,01	0,04	0,09	0,09
Fair distribution of social, environmental and economic benefits of the NBS project	0,04	0,06	0,02	0,01	0,02	0,05	0,06
Improvement of liveability	0,16	0,21	0,07	0,09	0,09	0,10	0,16
Improved access to urban green space	0,20	0,31	0,12	0,14	0,10	0,21	0,18
Increased visibility and opportunity for marginalized groups or indigenous peoples	0,02	0,04	0,01	-0,01	0,00	0,04	0,03
TOTAL: Inclusive & Effective Governance	0,11	0,09	0,05	0,04	0,10	0,12	0,08
Increased perception of safety	0,02	0,04	0,02	0,03	0,03	0,01	0,02
Decrease in crime rates	-0,02	-0,02	0,00	0,00	-0,02	0,00	-0,01
Increased involvement of locals in the management of green spaces	-0,04	-0,02	0,02	-0,03	-0,03	0,05	-0,05
Reduce financial cost for urban management	0,15	0,10	0,04	0,05	0,16	0,08	0,12

2.3. Spatial Scale

The UNA also aimed to understand the scope of the NBS interventions by recording the scales at which the NBS interventions are achieved. This information is distinguished between:

- Macro-scale: Global, continental and national level
- Meso-scale: Regional, metropolitan and urban level
- Micro-scale: District/neighbourhood level
- Sub micro-scale: Street scale

Although in some cases, two (7,2%) or three spatial scales (0,6%) were selected, in most cases (92,2%) only one spatial scale was identified for the NBS interventions. An example of such cases with multiple scales is the “Green roofs in Hamburg” project, that aimed at developing a city-wide comprehensive green roof strategy with multiple green roof locations across the city.

Across the 1000 European NBS interventions, the most commonly identified spatial scale was the micro-scale (44%), followed by sub-micro scale (38%), meso-scale (26%), with macro-scale only identified in a very marginal number of projects.

Table 19. Spatial scale of the 1000 European NBS interventions included in the UNA.

Scale	Number of projects
Micro-scale	444
Sub-microscale	382
Meso-scale	256
Macro-scale	2

In the case of projects that aimed to address at least three or all four studied goals (of climate change, biodiversity, health or economic development), the dominant scope continues to be the micro-scale (51%), however it is followed by meso-scalar projects (33%), and then ones on a sub-micro scale (25%). Projects that delivered multiple impacts were also less likely to take place at the sub-micro scale.

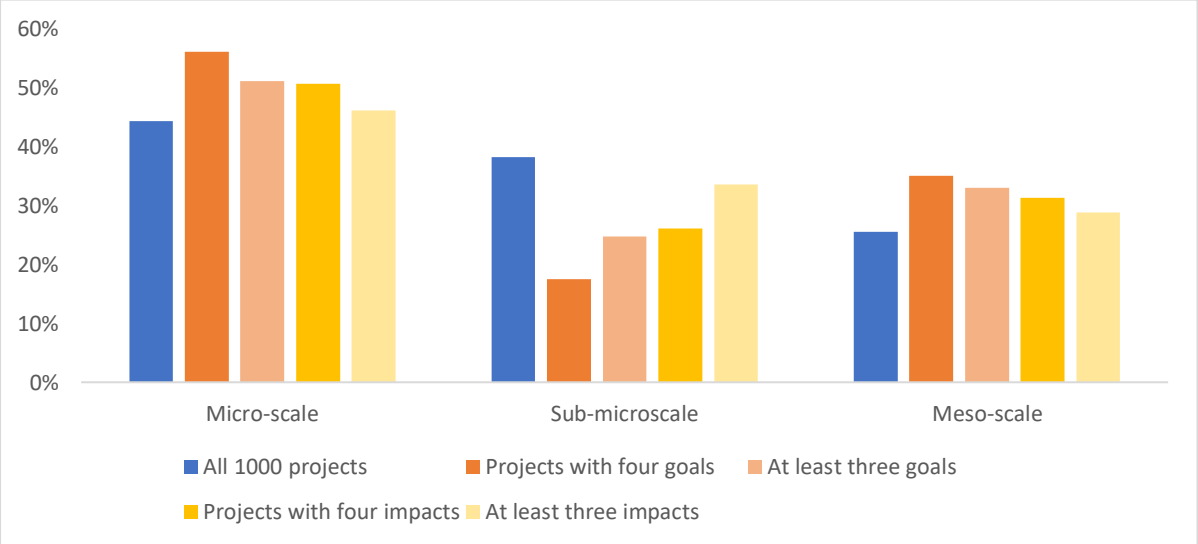


Figure 11. Spatial scale of projects, with specification of share of targeted goals and reported impacts.

Box 3: Green roofs in Findorff (Bremen, Germany)

This private green roof project in Bremen was implemented in two new residential building complexes. The project aimed to contribute to several goals including: sustainable urban development and real estate development, biodiversity conservation, rainwater retention, local air quality improvement and provisioning of natural thermoregulation for the buildings and thermal comfort.
Despite being considered as having a sub-micro scale, this project demonstrated significant co-benefits, such as providing a natural solution for thermoregulation, improvement of local air quality, supporting rainwater retention, increasing green space area. The project is also expected to improve the quality of life for residents, as well as expand the city's green infrastructure.

Source: https://una.city/nbs/bremen/green-roofs-findorff

Findings about projects with multiple goals:

- Micro-scale projects and meso-scale projects are more likely to be implemented by projects that aim to address all of the studied sustainability goals (from climate change, biodiversity, health, economy and social goals).
- Sub-micro scale projects are less likely to be implemented when projects aim to address multiple sustainability goals.
- Micro-scale projects are more prevalent when they target biodiversity, health and economic objectives together, while meso-scale projects tend to focus more on climate-related objectives, in combination with biodiversity, health or economy.

Table 20. Spatial scale of projects with multiple goals (variation from the overall results)

	Micro-scale	Sub-microscale	Meso-scale
Climate Change, Biodiversity, Health and Economy	0,12	-0,21	0,09
Climate Change, Biodiversity, Health, Economy AND Social Goals	0,13	-0,23	0,10
Projects addressing at least three goals	0,07	-0,13	0,07
○ Climate Change, Biodiversity And Health	0,05	-0,18	0,13
○ Climate Change, Biodiversity and Economy	0,09	-0,23	0,13
○ Biodiversity, Health and Economy	0,15	-0,16	0,03
○ Climate Change, Health and Economy	0,07	-0,10	0,04

Findings about projects with multiple impacts:

- Similarly to the analysis of the goals driving NBS implementation, larger scale projects more frequently produce multiple impacts than smaller scale projects.
- Micro-scale projects seem to be more likely to deliver impacts across the four impact categories.
- Meso-scale projects more often to report climate and biodiversity related impacts.

Table 21. Spatial scale of projects with multiple impacts (variation from the overall results)

	Micro-scale	Sub-microscale	Meso-scale
Climate Change, Biodiversity, Health and Economy	0,06	-0,12	0,06
Climate Change, Biodiversity, Health, Economy and Social	0,10	-0,14	0,06
Projects delivering at least three impact categories	0,02	-0,05	0,03
○ Climate Change, Biodiversity And Health	0,02	-0,10	0,09
○ Climate Change, Biodiversity and Economy	0,03	-0,09	0,08
○ Biodiversity, Health and Economy	0,04	-0,04	0,00
○ Climate Change, Health and Economy	0,07	-0,09	0,01

Table 22. Spatial scale of projects with multiple goals and multiple impacts (variation from the overall results)

	Micro-scale	Sub-microscale	Meso-scale
Climate Change, Biodiversity, Health and Economy	0.07	-0.23	0.20
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0.16	-0.30	0.18
Projects delivering at least three goals and impacts categories	0.08	-0.17	-0.17
○ Climate Change, Biodiversity And Health	0.05	-0.21	0.18
○ Climate Change, Biodiversity and Economy	0.02	-0.23	0.26
○ Biodiversity, Health and Economy	0.11	-0.15	0.06
○ Climate Change, Health and Economy	0.12	-0.18	0.09

2.4. Urban Settings

The NBS interventions are characterized in the UNA database by their physical manifestations, comprising a multiplicity of different systems, domains and landscapes in urban environments. These physical forms are referred in the database as urban settings, and include the categories presented in Table 22.

Table 23. Categories of NBS urban settings

Urban Settings	Sub-settings
Building greenery (external)	Green roofs (can include perennials, grasses, small trees, rooftop farming, mosses, succulents, few herbs and grasses); green walls or façades, greenery on balcony.
Urban green areas connected to grey infrastructure	Alleyside and roadside trees/hedges/greens; railroad bank and tracks; house gardens; green playground/ school grounds; institutional green space (green spaces surrounding public and private institutions and corporation buildings); green parking lots; riverbank greens;
Parks and (semi) natural urban green areas	Large urban park or forest (can include different features such as trees, grassy areas, playgrounds, water bodies, ornamental beds, etc.); pocket parks / neighbourhood green spaces; botanical garden (educational and ornamental areas); green corridor;
Allotments and community gardens	Allotments; community gardens; horticulture; farmlands;
Green indoor areas	Indoor vertical greenery (walls and ceilings e.g. ground-based climbing plants intended for ornamental purposes or plants growing in façade-bound substrate); atrium;
Blue areas	Lake/pond; river/stream/canal/estuary; delta; sea coast (e.g. sand beaches, cliffs, coastal dunes); wetland/bog/fen/marsh;
Green areas for water management	Rain gardens; swales / filter strips; sustainable urban drainage systems;
Derelict areas	Abandoned and derelict spaces with growth of wilderness or green features;

The average number of urban settings of the 1000 European projects is 1.99, and the average number of sub-settings is 4.47. Projects with at least three of the sustainability challenges in focus in this report (climate change, biodiversity, health and economic development) have a higher average of 2.37 urban settings and 5.52 sub-settings. Projects delivering impacts across the four studied impact categories have 2.4 urban setting and 5.6 urban setting on average.

Table 24. Average number of urban setting of projects with multiple goals and multiple impacts

	Sustainability goals		Reported impacts	
	Average number of urban settings	Number of projects in the sample	Average number of physical urban settings	Number of projects in the sample
Climate Change, Biodiversity, Health and Economy	2,79	57	2,40	134
Climate Change, Biodiversity, Health, Economy AND Social Goals	2,69	45	2,48	115
Projects addressing at least three goals	2,37	254	2,16	464
○ Climate Change, Biodiversity and Health	2,52	151	2,28	274

○ Climate Change, Biodiversity and Economy	2,71	65	2,32	170
○ Biodiversity, Health and Economy	2,35	103	2,11	248
○ Climate Change, Health and Economy	2,66	106	2,44	174

Table 25. Average number of urban sub-setting of projects with multiple goals and multiple impacts.

	Sustainability goals		Reported impacts	
	Average number of urban sub-settings	Number of projects in the sample	Average number of urban sub-settings	Number of projects in the sample
Climate Change, Biodiversity, Health and Economy	6,63	57	5,60	134
Climate Change, Biodiversity, Health, Economy AND Social Goals	6,40	45	5,83	115
At least three goals	5,52	254	4,96	464
Climate Change, Biodiversity And Health	5,88	151	5,29	274
Climate Change, Biodiversity and Economy	6,48	65	5,41	170
Biodiversity, Health and Economy	5,49	103	4,85	248
Climate Change, Health and Economy	6,25	106	5,66	174

In the 1000 European NBS interventions included in the UNA, the most commonly found urban setting is urban parks (56% of the total number of projects), followed by grey infrastructure with green features (40%). Approximately one third of the projects include blue areas (33%) and food production areas (29%). NBS integrated into buildings are found to a smaller extent, namely greenery on the exterior of buildings (19%), as well as green areas for water management (18%). Only a small sample of projects were included in the UNA that referred to green indoor areas (2%) and derelict areas (2%).

A more detailed overview of the urban settings and sub-settings include in the UNA is provided in Table 22.

Table 26. Urban settings of the 1000 European NBS interventions included in the UNA.

Urban Settings	Sub-categories of urban settings	Number of projects
Parks and (semi)natural urban green areas	**TOTAL: Parks and (semi)natural urban green areas**	**559**
	Large urban park or forest	282
	Pocket parks / neighbourhood green spaces	241
	Green corridor	137
	Botanical garden	28
Grey infrastructure with green features	**TOTAL: Grey infrastructure with green features**	**400**
	Alley and street trees/hedges/greens	177
	Riverbank greens	109
	Green playground/ school grounds	97
	Institutional green space	69
	Railroad bank and tracks	45
	Green parking lots	22
	House garden	21
Blue areas	**TOTAL: Blue areas**	**326**
	River/stream/canal/estuary	160

	Lake/pond	146
	Wetland/bog/fen/marsh	87
	Sea coast	29
	Delta	3
Food production areas	**TOTAL: Food production areas**	**286**
	Community gardens	220
	Allotments	110
	Horticulture	32
External building greens	**TOTAL: External building greens**	**190**
	Green roofs	129
	Green walls or facades	82
	Balcony green	25
Green areas for water management	**TOTAL: Green areas for water management**	**183**
	Sustainable urban drainage systems	130
	Rain gardens	37
	Swales / filter strips	37
Green indoor areas	**TOTAL: Green indoor areas**	**23**
	Indoor vertical greeneries (walls and ceilings)	13
	Atrium	7
Derelict areas	**TOTAL: Derelict areas**	**18**

As elaborated above, half of the 1000 NBS projects focused or included the urban setting of parks and/or urban forests (56%). When analysing the subset of projects that addressed multiple goals (four goals or at least three of the goals under study), these projects are likely to also take the form of parks and urban forests, blue areas, and green areas for water management, and report impacts in these categories. At the same time, these projects less frequently include food production NBS or greenery on the exterior of buildings (Figure 12).

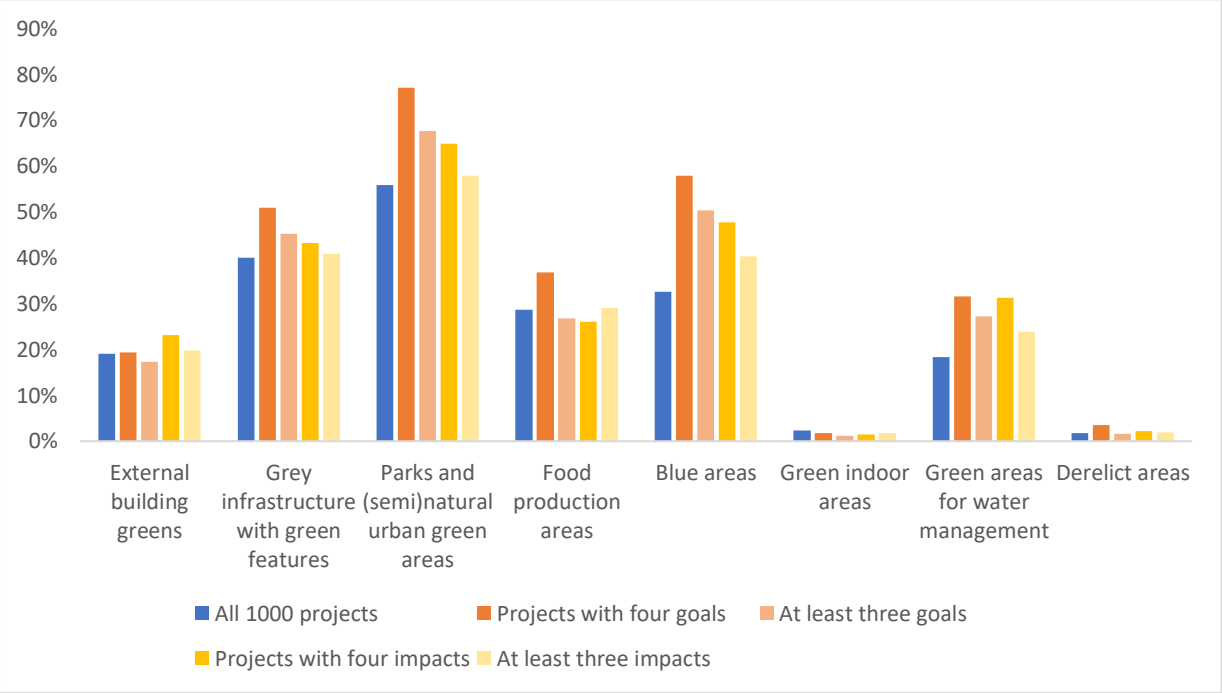
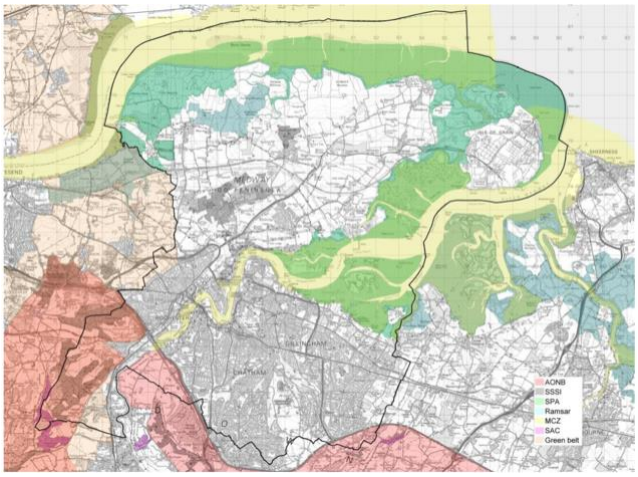


Figure 12. Share of urban settings and their targeted goals and reported impacts.

Box 4: Medway Green Grid (Medway, United Kingdom)



The Medway Green Grid project, finalised in 2015, aimed to link urban and rural neighbourhoods through a complex network of quality green spaces and corridors of landscape, with both recreational and ecological value. The project focused on managing multiple open spaces as a set of linkable sites, instead of isolated urban nature elements. The project was thus composed of diverse high-quality and functional elements, including large and small parks, green corridors, community gardens, wetland, riverbanks, street trees, green playgrounds and institutional green spaces.

Through this web of natural spaces, the project aimed to create safer routes for pedestrians and schools, improving access to nature, supporting habitat conservation, create opportunities for outdoor cultural events, education, flood regulation, as well as attract investments and visitors, and overall creating spaces for relaxation.

The project reported impacts across all of these objectives, with some of the highlights including the increased value of merging habitats for wildlife, the conservation of native trees that improved street aesthetics and reduced street noise, and the nature conservation efforts resulted in areas for water retention and flood alleviation. Additionally, the project allowed for the integration of safer cycling infrastructure and more integrated public transport with benefits for health and quality of life, the creation of outdoor classrooms and gyms provides opportunities for physical activity and learning of several school subjects (e.g. art classes, literacy hour, neighbourhood geography, environmental studies, sports, photography).Lastly, the project had a focus on local heritage and culture, and reported benefits related to improved access to green spaces that encouraged social interaction and provided opportunities for cultural events and provided a focus for interpretation and art events.

Source: https://una.city/nbs/medway/medway-green-grid

Findings about projects with multiple goals:

- Projects that targeted the four goals of climate change adaptation, biodiversity, health and economic development, are more likely to include NBS with parks or urban forests, blue areas and water management solutions.
- Projects that aim to address at least three goals tend to include blue areas, parks and green areas for water management. However, green areas for water management are somewhat less likely to be implemented if the project does not focus on climate action.
- External greenery on buildings as interventions are somewhat less frequent to be implemented for addressing multiple goals; especially in relation to biodiversity goals.
- NBS related with food production are less probable to be implemented as part of climate change-focused projects but are more likely to appear in projects with economy- oriented goals (agricultural production), as well as with biodiversity.

Table 27: Urban setting of projects with multiple goals – variation from the overall sample

	External building greens	Grey infrastructure with green features	Parks and (semi)natural urban green areas	Food production areas	Blue areas	Green indoor areas	Green areas for water management	Derelict areas
Climate Change, Biodiversity, Health and Economy	0.00	0.11	0.21	0.08	0.25	-0.01	0.13	0.02
Climate Change, Biodiversity, Health, Economy AND Social Goals	-0.06	0.13	0.22	0.09	0.25	0.00	0.04	0.03
Projects addressing at least three goals	*-0.02*	*0.05*	*0.12*	*-0.02*	*0.18*	*-0.01*	*0.09*	*0.00*
○ Climate Change, Biodiversity And Health	-0.02	0.10	0.14	-0.03	0.24	-0.02	0.13	0.00
○ Climate Change, Biodiversity and Economy	-0.01	0.06	0.16	0.07	0.29	-0.01	0.12	0.03
○ Biodiversity, Health and Economy	-0.05	0.00	0.19	0.09	0.13	0.01	-0.01	0.01
○ Climate Change, Health and Economy	*0.06*	*0.13*	*0.14*	*0.01*	*0.19*	*-0.01*	*0.17*	*0.00*

Projects delivering multiple impacts:

- Projects that reported impacts across the four impact categories, are more likely to include NBS with parks or urban forests, blue areas and water management.
- Interventions involving parks and urban forest have a good potential to deliver multiple impacts, particularly for the co-delivery of climate change, health and economic impacts.
- Blue and green areas for water management have a high potential to deliver multiple impacts, with a particularly relevant contribution to impacts corresponding with climate change adaptation.
- External building NBS and greened grey infrastructure projects seem to have lower potential for delivering impacts in all four studied impact areas, but more likely to deliver positive impacts related with climate change adaptation.
- NBS related with food production are also not particularly relevant at delivering multiple impacts, however these interventions seem to have a higher potential to deliver biodiversity, health and economy impacts simultaneously.

Table 28: Urban setting of projects with multiple impacts – variation from the overall sample.

	External building greens	Grey infrastructure with green features	Parks and (semi)natural urban green areas	Food production areas	Blue areas	Green indoor areas	Green areas for water management	Derelict areas
Climate Change, Biodiversity, Health and Economy	0,04	0,03	0,09	-0,02	0,15	-0,01	0,13	0,00
Climate Change, Biodiversity, Health, Economy AND Social Impacts	0,04	0,06	0,13	-0,01	0,16	-0,01	0,11	0,01
Projects delivering at least three impact areas	0,01	0,01	0,02	0,00	0,08	-0,01	0,06	0,00
○ Climate Change, Biodiversity and Health	0,04	0,05	0,05	-0,09	0,17	-0,01	0,09	0,00
○ Climate Change, Biodiversity and Economy	0,04	-0,01	0,02	-0,02	0,16	-0,01	0,15	0,00

○ Biodiversity, Health and Economy	-0,02	-0,02	0,05	0,09	0,01	0,00	0,00	0,01
○ Climate Change, Health and Economy	0,05	0,05	0,10	-0,02	0,11	-0,01	0,16	0,00

Table 29. Urban settings of projects with multiple goals and multiple impacts (variation from the overall results).

	External building ...	Grey infrastructure with green features	Parks and (semi)natural urban green areas	Food production areas	Blue areas	Green indoor areas	Green areas for water management	Derelict areas
Climate Change, Biodiversity, Health and Economy	0,05	0,12	0,23	0,14	0,34	-0,02	0,24	0,01
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,03	0,21	0,22	0,19	0,37	-0,02	0,12	0,03
Projects delivering at least three goals and impacts categories	-0,02	0,10	0,14	0,01	0,21	-0,01	0,10	0,00
o Climate Change, Biodiversity And Health	0,00	0,13	0,14	-0,05	0,28	-0,02	0,17	-0,01
o Climate Change, Biodiversity and Economy	0,04	0,09	0,16	0,15	0,34	-0,02	0,20	0,03
o Biodiversity, Health and Economy	-0,03	-0,02	0,18	0,15	0,15	0,01	0,02	0,01
o Climate Change, Health and Economy	0,04	0,21	0,21	0,06	0,28	-0,02	0,24	0,00

2.5. Implementation focus

In order to implement NBS in urban areas, projects can deliver various activities. The UNA database distinguished the following type of physical interventions:

- Creation of new green areas
- Creation of semi-natural blue areas
- Coastal landscape management or protection
- Maintenance and management of urban nature
- Ecological restoration of degraded ecosystems
- Protection of natural ecosystems
- Transformation of previously derelict areas
- Management of rivers and other blue areas

In addition, the UNA also identifies discursive interventions, which usually complemented physical interventions. These included:

- Knowledge-creation and awareness-raising
- Strategy, planning or policy development
- Improved governance of green or blue areas
- Monitoring of habitats and/or biodiversity

In the general sample of 1000 NBS projects, projects included **2.62** different type of physical interventions on average. Projects with multiple goals were more likely to implement a higher number of different interventions per project. This pattern is even more apparent, when we consider the delivered impacts. Projects with multiple goals had an average of **3.26** interventions, and projects delivering multiple impacts implemented **3.39** interventions.

Table 30. Average number of urban setting of projects with multiple goals and multiple impacts

	Sustainability goals		Delivered impacts	
	Number of projects in the sample	Average number of physical interventions	Number of projects in the sample	Average number of physical interventions
Climate Change, Biodiversity, Health and Economy	57	3.26	134	3.39
Climate Change, Biodiversity, Health, Economy AND Social Goals	45	3.22	115	3.38
Projects addressing at least three goals	254	3.39	464	3.20
○ Climate Change, Biodiversity And Health	*151*	*4.04*	274	3.83
○ Climate Change, Biodiversity and Economy	*65*	*3.18*	140	4.26
○ Biodiversity, Health and Economy	*103*	*2.81*	170	3.48
Climate Change, Health and Economy	*106*	*2.94*	36	3.83

The majority of the 1000 NBS projects implemented activities to create new green areas (68.5% of the projects). However, when they set multiple goals, they were more likely to (also) aim for:

- Maintenance and management of urban nature (27.1%)
- Management of rivers and other blue areas (16%)
- Ecological restoration of degraded ecosystems (13.1%)
- Protection of natural ecosystems (11.5%)

Similarly, to the projects that aim to address the goals of biodiversity protection, climate adaptation, health and economic development, projects with relevant benefits to these goals were also more likely to focus on the management, protection or restoration of existing urban nature. However, this difference is less prominent overall.

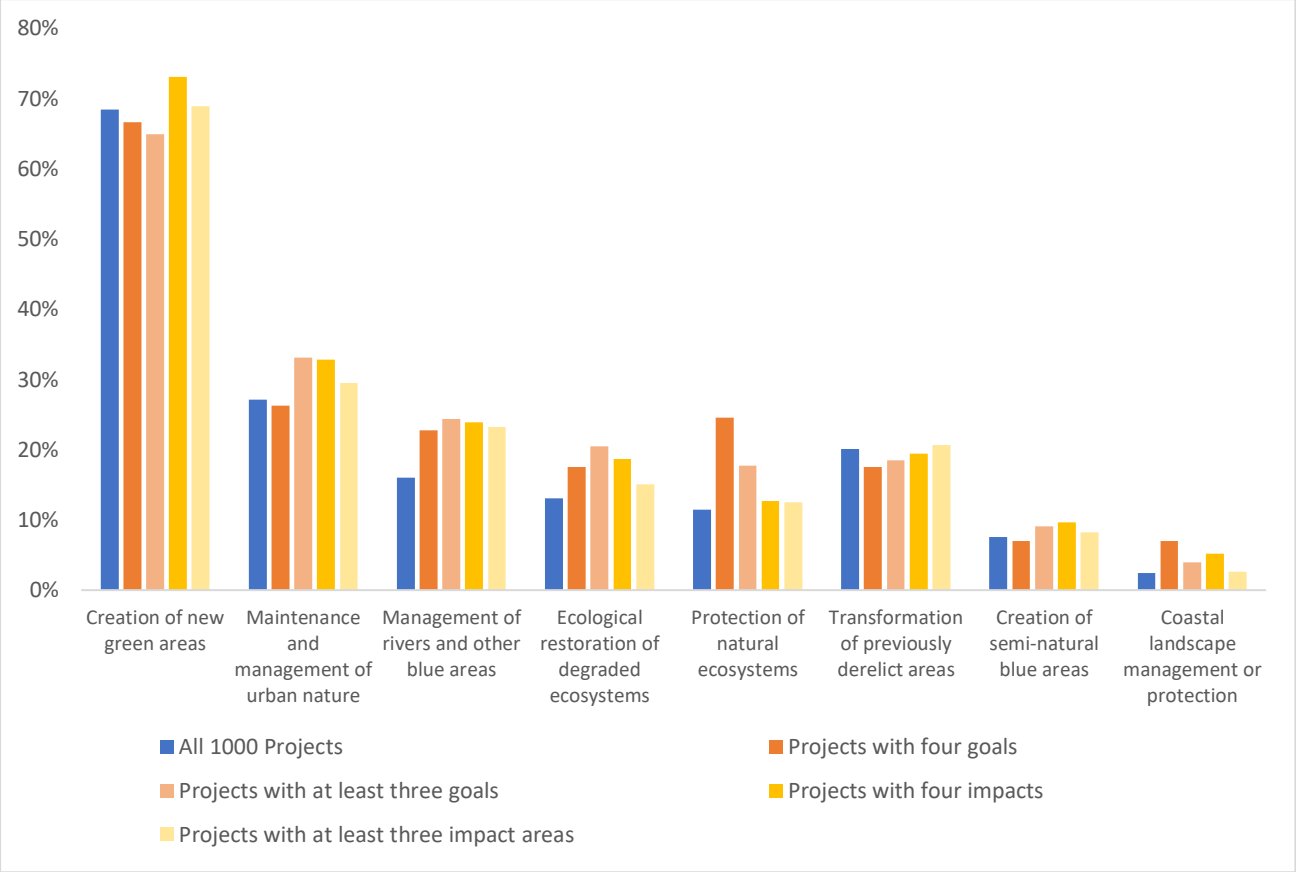


Figure 13. Comparison of implementation focus of all European projects and projects with multiple goals and impacts

Box 5:Agrarian Park of Baix Llobregat (Barcelona, Spain)

Located in the floodplains of the delta and lower valley of the river Llobregat (Spain), the Agrarian Park of Baix Llobregat (Parc Agrari del Baix Llobregat) is a central part of the metropolitan area of Barcelona. Consisting of nearly 3500 hectares and comprised of several districts, the park has a rich agricultural traditional background and is protected by a specific planning instrument and managed by the Barcelona Provincial Council.
The NBS project that focuses on the improved governance of green spaces and the maintenance and management of urban nature, takes the form of a protection plan for the improvement of the agrarian park. The objectives of the

plan include the promotion of sustainable agricultural production, while allowing for the preservation of the natural habitat and its biological value, as well as in preventing harmful urban expansion in the park area. The plan also aims to form a social space for people to enjoy and learn about local environmental protection and preserve the cultural and landscape heritage. Since its establishment, the agrarian park is globally regarded as an impressive example of sustainable peri-urban farming, due to its role in preservation of the ecological and heritage landscape, as well as the conservation of natural habitats and local biodiversity. The park acts as a green lung for the Barcelona metropolitan area and supplies the region with seasonal and locally sourced vegetables, with an environmentally friendly drip irrigation system, thus reducing the carbon footprint of the produce consumption. Additionally, the agrarian park promotes the valorisation of natural heritage, through the maintenance of traditional farming practices passed down from generations of farmers, and the promotion of sustainable consumption of local produce with expected positive health impacts.

Source: https://una.city/nbs/barcelona/agrarian-park-baix-llobregat

The detailed analysis of projects with multiple goals indicates that:

- Projects with multiple goals are more likely to involve blue infrastructure management, when a climate change adaptation goal is present.
- Projects focusing on ecological restoration and the protection of natural ecosystems are more frequent, when there is a specific biodiversity goals set in place.
- Projects with a biodiversity goal somewhat less often aim at creating new green spaces, but instead focus more prominently on the management, protection or restoration of green spaces.

Table 31. Implementation focus of projects with multiple goals – variation from the overall sample

	Creation of new green areas	Management of rivers and other blue areas	Maintenance and management of urban nature	Ecological restoration of degraded ecosystems	Protection of natural ecosystems	Transformation of previously derelict areas	Creation of semi-natural blue areas	Coastal landscape management or protection
Climate Change, Biodiversity, Health and Economy	-0.02	0.07	-0.01	0.04	0.13	-0.03	-0.01	0.05
Climate Change, Biodiversity, Health, Economy AND Social Goals	-0.04	0.06	-0.05	0.05	0.17	0.00	-0.01	0.04
Projects addressing at least three goals	*-0.04*	*0.08*	*0.06*	*0.07*	*0.06*	*-0.02*	*0.01*	*0.02*
○ Climate Change, Biodiversity and Health	-0.07	0.18	0.07	0.11	0.08	-0.03	0.01	0.00
○ Climate Change, Biodiversity and Economy	-0.05	0.06	-0.01	0.07	0.12	-0.02	-0.01	0.08
○ Biodiversity, Health and Economy	-0.06	-0.01	0.10	0.07	0.16	0.03	-0.03	0.01
○ Climate Change, Health and Economy	0.08	0.04	-0.05	-0.03	0.03	-0.06	0.05	0.04

The detailed analysis of projects delivering multiple impacts suggests that:

- Projects that have (an additional) focus on the management of urban nature as well as on the restoration of natural ecosystems are somewhat more prevalent to deliver multiple impacts.
- Projects that focus on maintaining green areas also have an above the average potential to deliver multiple impacts.

- Projects that focus on creating green areas were less likely to set multiple goals but more likely to deliver multiple impacts especially contributing to health and well-being.

Table 32. Implementation focus of projects with multiple goals – variation from the overall sample

	Creation of new green areas	Maintenance and management of urban nature	Management of rivers and other blue areas	Ecological restoration of degraded ecosystems	Protection of natural ecosystems	Transformation of previously derelict areas	Creation of semi-natural blue areas	Coastal landscape management or protection
Climate Change, Biodiversity, Health and Economy	0.05	0.06	0.08	0.06	0.01	-0.01	0.02	0.03
Climate Change, Biodiversity, Health, Economy AND Social impacts	0.07	0.08	0.07	0.05	0.03	0.01	0.03	0.03
Projects addressing at least three impact areas	*0.00*	*0.02*	*0.07*	*0.02*	*0.01*	*0.01*	*0.01*	*0.00*
○ Climate Change, Biodiversity and Health	-0.04	0.04	0.16	0.07	0.05	-0.06	0.01	0.01
○ Climate Change, Biodiversity and Economy	0.00	0.03	0.10	0.05	0.00	-0.01	0.04	0.02
○ Biodiversity, Health and Economy	0.06	0.06	-0.01	0.01	0.00	0.05	-0.01	0.01
○ Climate Change, Health and Economy	0.09	0.02	0.04	0.02	-0.01	0.03	0.02	0.02

In addition to physical interventions, 37% of the UNA projects also implemented discursive interventions.

- Among the 254 projects that aimed to address at least three goals, 91 projects included interventions geared towards such discursive goals (35.8%). Compared to the general sample, projects that aimed to address at least 3 of the studied sustainability goals, more often focused on strategy and policy development and targeted management practices. At the same time, these projects were less likely to involve knowledge creation and awareness-raising activities.
- Among the 464 projects that delivered impacts in at least three of the studied impact areas, 154 included deliberative interventions, focusing somewhat more prominently on strategy or policy development and improvements of urban nature management.

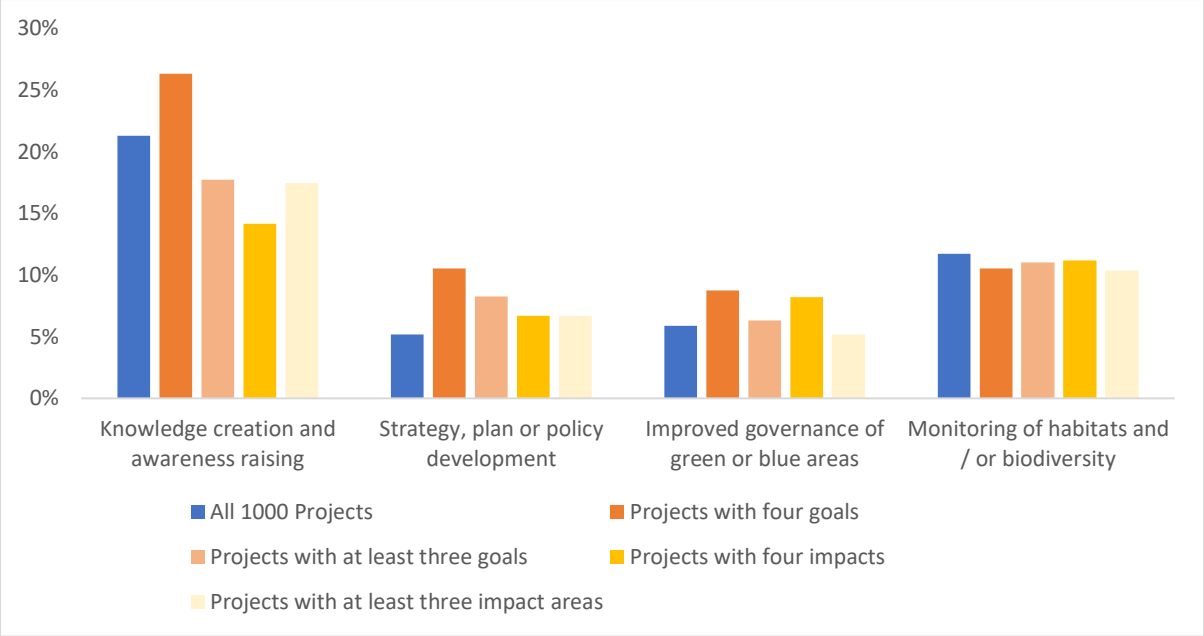


Figure 14. Comparison of implementation focus of all European projects and projects with multiple goals and impacts

Table 33. Implementation focus of projects with multiple goals and multiple impacts (variation from the overall results).

	Creation of new green areas	Creation of semi-natural blue areas	Coastal landscape management or protection	Maintenance and management of urban nature	Ecological restoration of degraded ecosystems	Protection of natural ecosystems	Transformation of previously derelict areas	Management of rivers and other blue areas
Climate Change, Biodiversity, Health and Economy	-0,02	-0,02	0,10	0,06	0,08	0,10	-0,08	0,08
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	-0,03	0,01	0,11	-0,01	0,09	0,19	-0,07	0,10
Projects delivering at least three goals and impacts categories	-0,06	0,02	0,01	0,08	0,11	0,08	-0,02	0,10
o Climate Change, Biodiversity And Health	-0,09	0,03	0,01	0,08	0,15	0,11	-0,04	0,22
o Climate Change, Biodiversity and Economy	-0,07	-0,02	0,10	0,04	0,10	0,09	-0,05	0,07
o Biodiversity, Health and Economy	-0,09	-0,03	0,03	0,16	0,10	0,13	-0,04	-0,03

o Climate Change, Health and Economy	0,10	0,03	0,07	-0,02	0,01	0,01	-0,03	0,03

2.6. Project Beneficiaries

The analysis of the projects included in the UNA also identified those primary beneficiaries of the NBS interventions who were directly impacted by the implemented NBS at hand. Project beneficiaries are categorized into the following:

- National-level government (e.g. national ministries or public agencies)
- Local government/ Municipality (e.g. mayor office, city council, city assembly, town council)
- Public sector institution (e.g. school or hospital)
- Non-government organisation/ Civil society (not-for profit organisation, operating independently from the state, international organisations or the private sector)
- Private sector/ Corporate/ Company (for-profit organisations, run by companies or individuals)
- Researchers/University
- Citizens or community groups (Individuals, groups of local people, association of individuals working for a public benefit)
- Marginalized groups (Elderly people, (Im)migrants, Low-income citizens, People with functional diversities/disabilities)

The average number of beneficiary groups identified for the 1000 projects is **1.99**. Projects with at least three of the studied sustainability challenges have a higher average of 2.31 identified beneficiary groups. Regarding projects delivering impacts across all four studied impact categories, the analysis suggests that they have an average of 2.16 beneficiaries.

Table 34. Average number of project beneficiaries with multiple goals and multiple impacts

	Sustainability goals		Delivered impacts	
	Average number of beneficiaries group	Number of projects in the sample	Average number of beneficiaries group	Number of projects in the sample
Climate Change, Biodiversity, Health and Economy	2,72	57	2,16	134
Climate Change, Biodiversity, Health, Economy AND Social Goals	3,00	45	2,30	115
Projects addressing at least three goals	2,31	254	1,99	464
• Climate Change, Biodiversity And Health	2,29	151	2,02	274
• Climate Change, Biodiversity and Economy	2,74	65	2,04	170
• Biodiversity, Health and Economy	2,71	103	2,08	248

• Climate Change, Health and Economy	2,34	106	2,19	174

In the overall set of European NBS projects, the most commonly identified group of beneficiaries are local governments or municipalities, across almost half of the 1000 projects (46%). The second most common beneficiary are citizens or community groups (39%), followed by young people or children (21%). The least identified beneficiary group is national governments (5%).

Table 35. Number of primary beneficiaries 1000 European NBS interventions included in the UNA.

Beneficiaries	Number of projects
Local government/Municipality	464
Citizens or community groups	390
Young people and children	211
Marginalized groups	182
Private sector/Corporate/Company	159
Researchers/University	122
Non-government organisation/Civil Society	119
Public sector institution (e.g. school or hospital)	105
Food producers and cultivators	67
National-level government	53

When analysing the distribution of beneficiary groups across the sample of projects that targeted four or at least three goals and delivered similar types of impacts, the distribution is fairly similar. However, in projects that targeted four or at least three of the studied sustainability goals, all groups of beneficiaries are mentioned more often, particularly local governments and community groups.

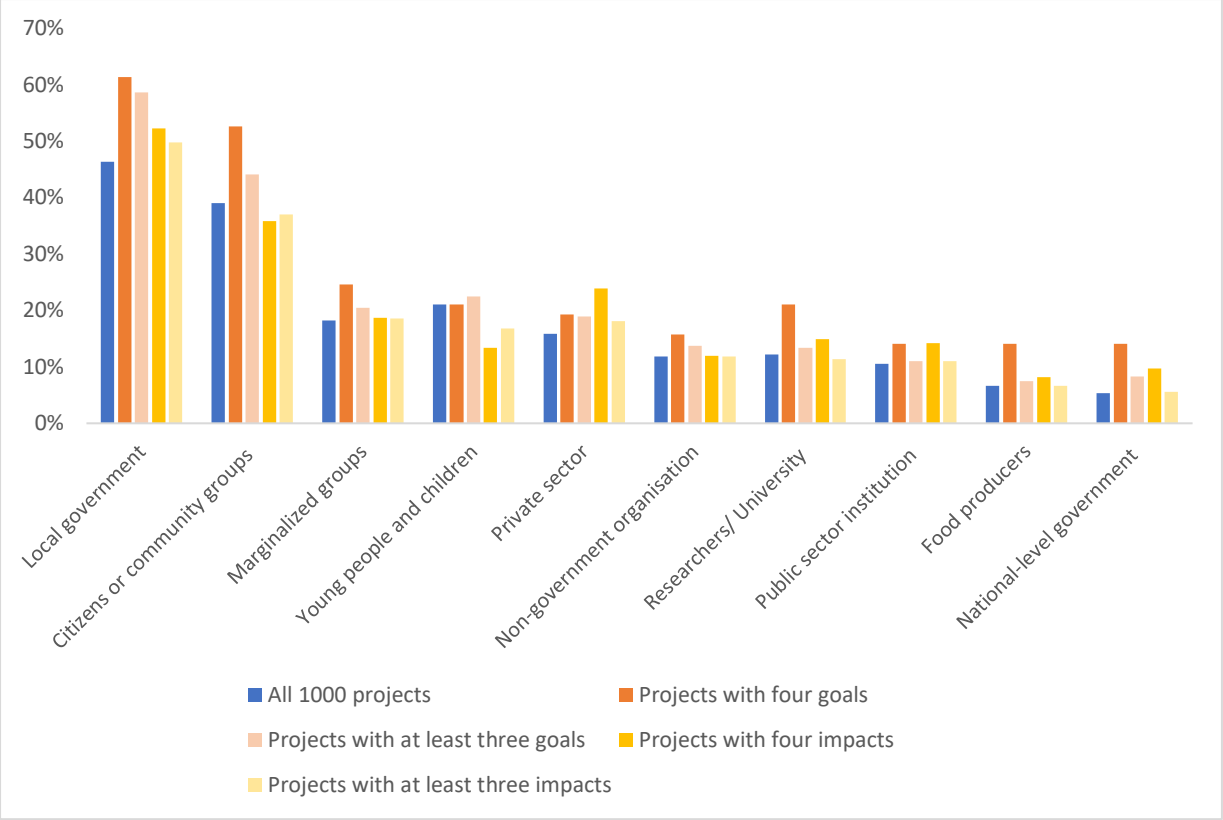


Figure 15. Comparison of beneficiary groups of all European projects and projects with multiple goals and impacts

Regarding marginalized groups, this beneficiary group is only identified in 18% of the total number of projects. Within this category, elderly people and low-income citizens are the most commonly identified as being targeted beneficiaries (both with 71 projects), followed by people with functional diversities (68 projects), and lastly migrants (21 projects).

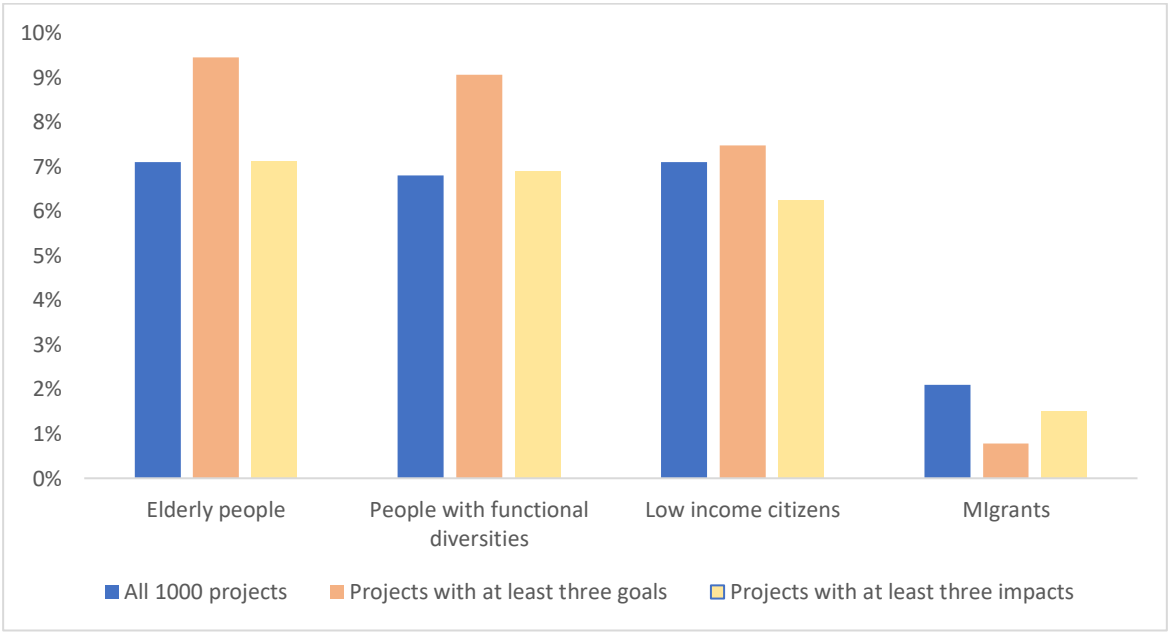


Figure 16. Comparison of implementation focus of all European projects and projects with multiple goals and impacts

Box 6:Port Sunlight River Park (Wirral, United Kingdom)

The creation of the Port Sunlight River Park took place on a previously closed landfill site and marsh area that was transformed into a place with interconnected walkways amongst wildlife, wildflowers, woodland and a wetland area. Co-governed by different actors, the project is managed by Autism Together (formerly Wirral Autistic Society) on behalf of the open space management charity the Land Trust. Autism Together were involved to realise the vision of the Land Trust to provide an opportunity for a community site that takes local citizens as the primary beneficiaries of the project, and makes a positive difference for local people and visitors, while promoting healthy lifestyles.

The main objectives of the project were centered on transforming this landfill site into an attractive waterfront, rich in biodiversity and healthy habitats, which benefits local communities and potentially boosts economic development of the wider Wirral area and coastline.

The project is still ongoing, however intermediate results report that nearly 16,000 trees have been planted, with species selection focusing on vegetation that supports climate change resilience. An increase in the number of bird species has also been recorded (80 bird species), and the site is recognised as a valuable green space for the local community and has successfully opened previous inaccessible areas of Liverpool's historic waterfront.

Source: https://una.city/nbs/wirral/port-sunlight-river-park

Findings about projects addressing at least three of the studied sustainability goals:

- Projects that aim to address four goals (across climate change, biodiversity, health, economy and social goals) tend to report beneficiaries across all “stakeholder” groups, with a stronger emphasis on local governments, citizens or community groups, researchers/universities, as well as food producers and marginalized groups.
- Projects that target at least three goals, tend to identify local governments as project beneficiaries more often, than any other beneficiary group.
- Public sector institutions seem to be identified more often through projects that aim to address biodiversity, health and economy, and less likely in climate-related projects.
- The private sector are mentioned more often as a beneficiary in projects dealing with climate change, health and economy, and less in projects that do not address climate change.
- NBS that identify marginalized groups as beneficiaries seem to involve projects that target biodiversity, health and economy, and are mentioned less frequently in projects that include climate change as a goal.

Table 36. Beneficiaries of projects addressing multiple goals (variation from the overall sample).

	National-level government	Local government/Municipality	Public sector institution (e.g. school or hospital)	Non-government organisation/Civil Society	Private sector/Corporate/Company	Researchers/University	Citizens or community groups	Marginalized groups	Food producers and cultivators	Young people and children
Climate Change, Biodiversity, Health and Economy	0,09	0,15	0,04	0,04	0,03	0,09	0,14	0,06	0,07	0,00
Climate Change, Biodiversity, Health, Economy AND Social goals	0,06	0,20	0,05	0,08	-0,03	0,10	0,23	0,08	0,11	0,06
Projects addressing at least three goals	0,03	0,12	0,01	0,02	0,03	0,01	0,05	0,02	0,01	0,01
○ Climate Change, Biodiversity And Health	0,02	0,11	0,02	0,04	-0,01	0,02	0,05	0,02	0,00	0,01
○ Climate Change, Biodiversity and Economy	0,07	0,17	0,02	0,02	0,06	0,09	0,15	0,03	0,09	0,04
○ Biodiversity, Health and Economy	0,08	0,15	0,06	0,06	0,02	0,05	0,13	0,10	0,06	-0,01
○ Climate Change, Health and Economy	0,06	0,13	-0,03	-0,02	0,10	0,03	0,04	0,02	0,03	0,01

Findings about projects delivering impacts in at least three of the studied sustainability challenge areas:

- Projects that deliver impacts across four or five impact categories (from climate change, biodiversity, health, economy and social goals) report the private sector and local governments as beneficiaries of the projects more often.
- On the opposite spectrum, these projects are less likely to identify young people/children, citizens or non-government groups as project beneficiaries.
- Projects that report impacts on at least three impact categories, are more likely to identify local governments and the private sector as project beneficiaries, and less likely to mention young people/children, citizens or researchers/universities as project beneficiaries.

Table 37. Beneficiaries of projects delivering multiple impacts (variation from the overall sample).

	National-level government	Local government/Municipality	Public sector institution (e.g. school or hospital)	Non-government organisation/Civil Society	Private sector/Corporate/Company	Researchers/University	Citizens or community groups	Marginalized groups	Food producers and cultivators	Young people and children

Climate Change, Biodiversity, Health and Economy	0,04	**0,06**	0,04	0,00	**0,08**	0,03	-0,03	0,00	0,02	-0,08
Climate Change, Biodiversity, Health, Economy AND Social Goals	0,03	**0,08**	0,02	0,01	**0,11**	0,03	0,00	0,04	0,03	-0,07
Projects delivering at least three impact categories	0,00	**0,03**	0,00	0,00	**0,02**	-0,01	-0,02	0,00	0,00	-0,04
○ Climate Change, Biodiversity And Health	0,01	0,08	0,03	0,01	0,03	0,01	-0,05	-0,02	-0,02	-0,07
○ Climate Change, Biodiversity and Economy	0,04	0,05	0,02	-0,01	0,06	0,00	-0,05	-0,02	0,02	-0,08
○ Biodiversity, Health and Economy	0,01	0,01	0,01	0,01	0,02	0,00	0,01	0,03	0,04	-0,04
○ Climate Change, Health and Economy	0,04	0,04	0,01	-0,01	0,10	0,03	0,00	0,03	0,00	-0,05

Table 38. Beneficiaries of projects with multiple goals and multiple impacts (variation from the overall results).

	National-level government	**Local government/Municipality**	**Public sector institution (e.g. school or hospital)**	**Non-government organisation/Civil Society**	**Private sector/Corporate/Company**	**Researchers/University**	**Citizens or community groups**	**Marginalized groups**	**Food producers and cultivators**	**Young people and children**
Climate Change, Biodiversity, Health and Economy	0,13	0,20	0,08	0,12	0,08	0,06	0,06	0,00	0,11	-0,15
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,08	0,32	0,16	0,23	0,01	0,10	0,22	0,04	0,19	-0,12
Projects delivering at least three goals and impacts categories	0,02	0,12	0,01	0,04	0,03	0,02	0,02	0,01	0,01	-0,02
o Climate Change, Biodiversity And Health	0,02	0,15	0,04	0,08	-0,01	0,04	0,02	-0,02	0,00	-0,03
o Climate Change, Biodiversity and Economy	0,10	0,18	0,05	0,09	0,12	0,03	0,07	-0,03	0,14	-0,11
o Biodiversity, Health and Economy	0,06	0,13	0,05	0,10	0,03	0,04	0,09	0,06	0,09	-0,08
o Climate Change, Health and Economy	0,09	0,16	-0,01	0,02	0,14	0,03	0,00	0,01	0,03	-0,09

Q3: What is the financial size and composition of all these initiatives?

In this section we will provide a financial characterisation of the projects in the UNA, according to the following factors:

- Financial scale
- Funding bodies
- Financial sources
- Non-financial contributions

3.1. Financial Scale

The financial scale of projects constitutes the total investment costs of the NBS project (in EUR). This data was collected for each NBS project –when data was available– in the form of a cost range.

NBS projects can have very different investments costs based on their scale and issues the project aim to tackle. The most recorded financial scale across the 1000 European costs was the highest range, above 4 000 000 EUR (22% of projects). This cost range is followed by 500 000 - 2 000 000 EUR (11%), 10 000 - 50 000 EUR (9%), and 100 000 - 500 000 EUR (9%). However, information regarding project costs was not found for 36% of the projects.

Table 39. Financial scale of the 1000 European NBS interventions included in the UNA.

Financial scale	Number of projects
Less than 10 000 EUR	10
10 000 - 50 000 EUR	90
50 000 - 100 000 EUR	44
100 000 - 500 000 EUR	93
500 000 - 2 000 000 EUR	105
2 000 000 - 4 000 000 EUR	67
Above 4 000 000 EUR	220
Unknown	356

Box 7: Mill Leat Restoration, Bute Park (Cardiff, United Kingdom)

The Bute Park Restoration project aimed at maximising public access to- and use of Bute Park, while re-flooding the dry original medieval millstream. The project thus targeted the transformation of the mill leat (open watercourse conducting water to a mill), into a self-contained, self-regulating and self-circulating system, thus reducing the risk of flooding and creating a sustainable water system while providing a new habitat for wildlife.
Other accomplished goals of the project included restoring and conserving the historical heritage of the site of both environmental and cultural interest, creating a well-managed sustainable water regime, creating opportunities for recreation and education about the role of nature, and supporting biodiversity.
Regarding the financial aspects of the project, the Bute Park Restoration project was funded by public local authorities and direct funding from the Heritage Lottery Fund which distributed a heritage share of National Lottery funding to support a wide variety of projects across the UK. The total cost of the initiative was £900,000, and supported the implementation of the restoration of the Mill Leat.

Source: https://una.city/nbs/cardiff/mill-leat-restoration-bute-park

When comparing with the 1000 projects, projects addressing four or at least three goals are more commonly found in the higher budget categories.

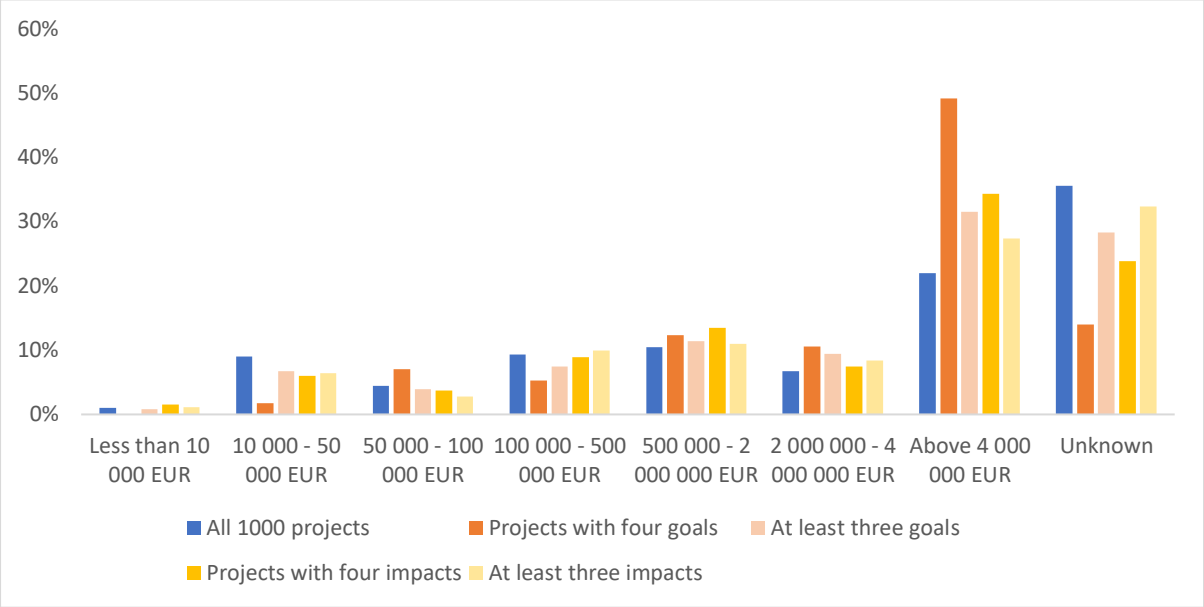


Figure 17. Comparison of the financial scale of all European projects and projects with multiple goals and impacts

The detailed analysis of projects with multiple goals indicates that:

- Projects that targeted the four goals of climate change, biodiversity, health and economic development, tended to be NBS projects with a higher financial scale (above 500 000 EUR).
- Projects with lower financial scales (below 500 000 EUR) are less likely to aim at tackling multiple sustainability goals.

Table 40. Financial scale of projects addressing multiple goals - variation from the overall sample.

	Less than 10 000 EUR	**10 000 - 50 000 EUR**	**50 000 - 100 000 EUR**	**100 000 - 500 000 EUR**	**500 000 - 2 000 000 EUR**	**2 000 000 - 4 000 000 EUR**	**Above 4 000 000 EUR**
Climate Change, Biodiversity, Health and Economy	-0,01	-0,07	0,03	-0,04	0,02	0,04	0,27
Climate Change, Biodiversity, Health, Economy AND Social Goals	-0,01	-0,07	0,04	-0,03	0,03	0,04	0,25
Projects addressing at least three goals	0,00	-0,02	0,00	-0,02	0,01	0,03	0,09
○ Climate Change, Biodiversity And Health	0,00	-0,04	0,00	-0,01	0,01	0,03	0,13
○ Climate Change, Biodiversity and Economy	-0,01	-0,07	0,02	-0,03	0,05	0,07	0,23
○ Biodiversity, Health and Economy	-0,01	-0,01	0,01	-0,03	-0,01	0,03	0,13
○ Climate Change, Health and Economy	0,00	-0,06	0,01	-0,05	0,02	0,01	0,21

Similarly to the goals analysis, projects that reported delivering multiple impacts simultaneously, were more likely to include NBS projects with high financial scales (above 4 000 000 EUR). Projects with low financial costs are less likely to deliver

multiple co-benefits in the impact areas under analysis. However, this result can be somewhat distorted due to the relatively high number of projects without information on their total cost. It is possible that projects with smaller budgets less frequently reported on their financials.

Table 41. Financial scale of projects delivering multiple impacts - variation from the overall sample.

	Less than 10 000 EUR	**10 000 - 50 000 EUR**	**50 000 - 100 000 EUR**	**100 000 - 500 000 EUR**	**500 000 - 2 000 000 EUR**	**2 000 000 - 4 000 000 EUR**	**Above 4 000 000 EUR**
Climate Change, Biodiversity, Health and Economy	0,00	-0,03	-0,01	0,00	0,03	0,01	0,12
Climate Change, Biodiversity, Health, Economy AND Social Goals	0,01	-0,06	-0,01	-0,01	0,03	0,02	0,14
Projects delivering at least three impact categories	0,00	-0,03	-0,02	0,01	0,00	0,02	0,05
○ Climate Change, Biodiversity And Health	0,00	-0,03	-0,01	0,01	0,01	0,01	0,08
○ Climate Change, Biodiversity and Economy	0,00	-0,03	-0,01	0,01	0,02	0,03	0,10
○ Biodiversity, Health and Economy	0,00	-0,02	-0,01	0,00	0,02	0,00	0,05
○ Climate Change, Health and Economy	0,00	-0,03	-0,02	0,00	0,02	0,02	0,14

Table 42. Financial scale of projects with multiple goals and multiple impacts (variation from the overall results).

	Less than 10 000 EUR	**10 000 - 50 000 EUR**	**50 000 - 100 000 EUR**	**100 000 - 500 000 EUR**	**500 000 - 2 000 000 EUR**	**2 000 000 - 4 000 000 EUR**	**Above 4 000 000 EUR**
Climate Change, Biodiversity, Health and Economy	-0,01	-0,06	0,02	-0,09	0,08	0,08	0,30
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	-0,01	-0,09	0,00	-0,09	0,11	0,11	0,30
Projects delivering at least three goals and impacts categories	0,00	-0,03	-0,02	-0,03	0,02	0,03	0,12
o Climate Change, Biodiversity And Health	0,00	-0,04	-0,01	-0,01	0,03	0,03	0,12
o Climate Change, Biodiversity and Economy	-0,01	-0,06	0,01	-0,07	0,07	0,14	0,24
o Biodiversity, Health and Economy	-0,01	-0,02	0,00	-0,06	0,03	0,05	0,11
o Climate Change, Health and Economy	0,01	-0,04	-0,01	-0,09	0,05	0,03	0,31

3.2. Sources of Funding

NBS interventions can be financed through a variety of financial sources, and in some cases through multiple financial sources simultaneously. From the total number of European projects included in the UNA, municipalities or public local authorities are most likely to finance NBS projects (58%). Other funding sources include public national budgets (19%), EU funds (18%), public regional budgets (16%) and corporate investment (16%).

Table 43. Financial sources of the 1000 European NBS interventions included in the UNA.

Source(s) of Funding	Number of projects
Public local authority's budget	582
Public national budget	185
EU funds	179
Public regional budget	160
Corporate investment	157
Funds provided by non-governmental organisation	114
Private Foundation / Trust	100
Crowdfunding	58
Commercial banks	6
Multilateral funds (e.g. EBRD, Worldbank)	2
Angel / informal investors	2
Insurance firms	1
Private equity funds	1

Box 8: Building the town of NyE (Arhus, Denmark)

The city of Arhus faces several sustainability pressures related with water management and flooding prevention linked to climate change. In order to allow the use of water to create recreational value for residents, they city needs to work to avoid groundwater pollution, and improve the environment of streams and ponds. The construction of the town of NyE is an innovative project for a new city suburb (NyE), where state-of-the-art architecture is implemented alongside integrated solutions for groundwater, rainwater, wastewater, and streams and ponds, in order to build a balanced aquatic environment within the city.
The project has a budget of 1 billion DKK (i.e. around 100 million EUR), and is funded through a combination of public local authority's budget and corporate investment, with a partnership between the City Council and Arhus Vand (Arhus Water) with the property developer Tækker Group.The project thus is considered to set new standards for how a private developers can join forces with a local authority, to create an innovative and future-looking town with a cohesive approach for a more balanced and sustainable future.
As the project is still ongoing, actual impacts have not yet been measured, however the project is expected to prevent flooding events and improve groundwater and surface water quality, with an integration of blue and green infrastructure. One of the project's long-term goals is the establishment of a climate park that takes the form of a nature reservation with marshy areas, trees and other greenery.

The initiative is expected to attract new residents to the area and significantly improve the quality of life of this community.

Source: https://una.city/nbs/arhus/building-town-nye

In the total sample of projects included in this study, the average number of financing sources is 1.55. When looking at the projects that targeted at least three goals, this average is 1.70, and 1.64 for projects with reported impacts across at least three impact categories.

Table 44. Average number of financing sources used in projects with multiple goals and multiple impacts.

	Sustainability goals		Delivered impacts	
	Average number of financing sources	Number of projects in the sample	Average number of financing sources	Number of projects in the sample
Climate Change, Biodiversity, Health and Economy	1,77	57	1,67	134
Climate Change, Biodiversity, Health, Economy AND Social Goals	1,76	45	1,70	115
Projects addressing at least three goals	1,70	254	1,64	464
○ Climate Change, Biodiversity And Health	1,74	151	1,64	274
○ Climate Change, Biodiversity and Economy	1,72	65	1,66	170
○ Biodiversity, Health and Economy	1,76	103	1,60	248
○ Climate Change, Health and Economy	1,68	106	1,75	174

In projects that targeted four or at least three sustainability goals, the most common financing source is also public local authority's budget, however it is followed by public regional budgets, public national budgets. EU funds are less common in projects that aimed to address four goals, in comparison with the total project sample. Projects with public local budgets, corporate investments and regional budgets tend to report delivery of multiple impacts at a higher rate than those projects that set multiple goals.

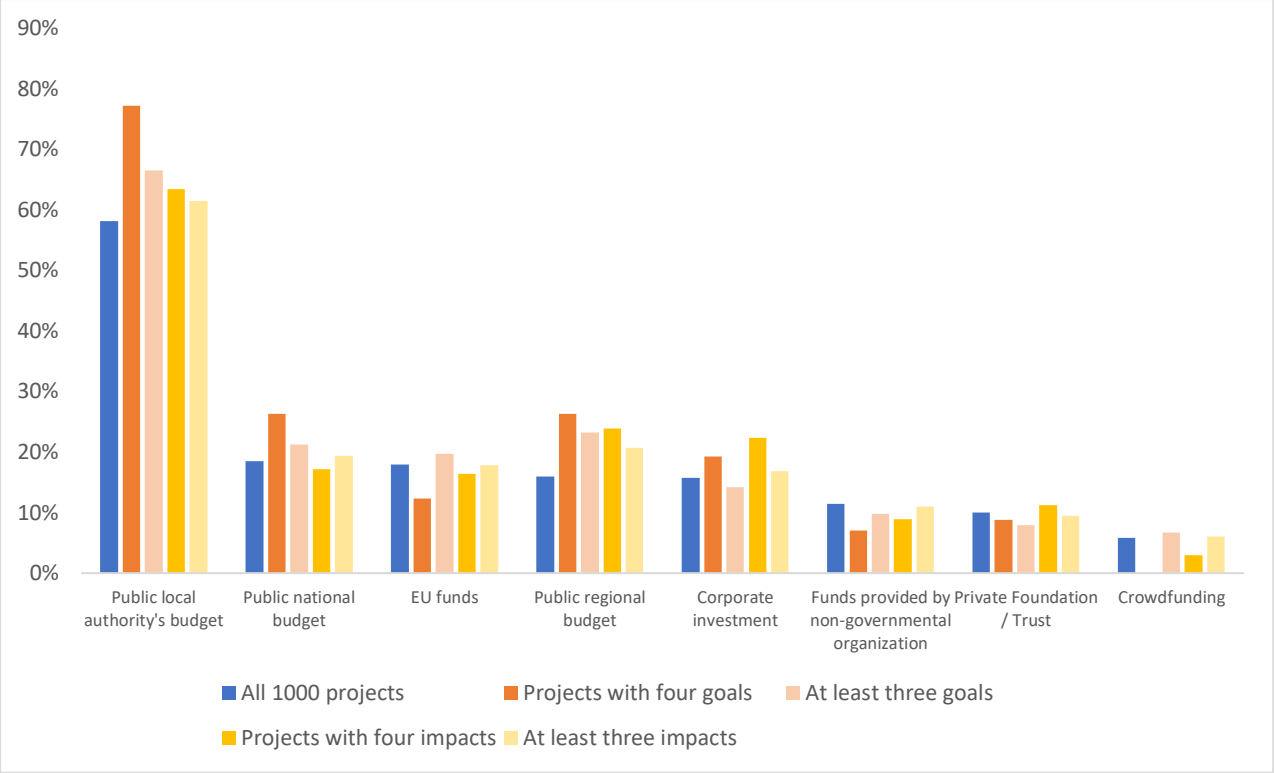


Figure 18. Comparison of the financing sources of all European projects and projects with multiple goals and impacts

The detailed analysis of projects with multiple goals indicates that:

- NBS projects that aimed to address five or four sustainability goals, are more often supported by public local and regional authority's budgets. Additionally, these projects are less likely to be supported by EU funds and crowdfunding schemes.
- Projects that aim at addressing at least three sustainability goals are most often supported by public local and regional authority's budgets, and to a smaller extent are also backed by public national budgets and EU funds.
- Corporate investment seems to focus more on projects that involve climate action simultaneously with economic development.
- Crowdfunding schemes seem to support projects that tackle biodiversity, health and economy together.

Table 45. Sources of funding used in projects addressing multiple goals - variation from the overall sample.

	EU funds	Public national budget	Public regional budget	Public local authority's budget	Corporate investment	Funds provided by non-governmental organisation	Private Foundation	Crowdfunding	Commercial banks
Climate Change, Biodiversity, Health and Economy	-0,06	0,08	0,10	0,19	0,04	-0,04	-0,01	-0,06	-0,01

Climate Change, Biodiversity, Health, Economy AND Social Goals	-0,07	0,13	0,06	0,22	-0,02	-0,03	-0,01	-0,06	-0,01
Projects addressing at least three goals	0,02	0,03	0,07	0,08	-0,02	-0,02	-0,02	0,01	-0,01
○ Climate Change, Biodiversity And Health	0,03	0,03	0,08	0,15	-0,04	-0,02	-0,01	-0,01	-0,01
○ Climate Change, Biodiversity and Economy	-0,01	0,08	0,09	0,14	0,03	-0,05	-0,02	-0,06	-0,01
○ Biodiversity, Health and Economy	-0,06	0,05	0,13	0,09	-0,03	0,00	0,01	0,04	-0,01
○ Climate Change, Health and Economy	-0,02	0,05	0,05	0,13	0,09	-0,05	-0,04	-0,06	-0,01

The detailed analysis of projects with multiple goals indicates that:

- Projects that deliver impacts across the four studied sustainability impact categories, are more likely to be supported by public local regional authorities, corporate investments and local public budgets.
- Projects that report impacts across three impacts categories are more commonly backed by public regional and local budgets.
- At the same time, they are less often supported by funds provided by non-governmental organisation, EU funds and public national budgets.
- Funds provided by non-governmental organisations and crowdfunding are more likely to be invested into projects that deliver co-benefits to biodiversity, health and economy, rather than climate change-related projects.

Table 46: Sources of funding used in projects delivering multiple impacts - variation from the overall sample.

	EU funds	**Public national budget**	**Public regional budget**	**Public local authority's budget**	**Corporate investment**	**Funds provided by non-governmental organisation**	**Private Foundation**	**Crowdfunding**	**Multilateral funds**	**Commercial banks**
Climate Change, Biodiversity, Health and Economy	-0,01	-0,01	0,08	0,05	0,07	-0,02	0,01	-0,03	0,01	-0,01
Climate Change, Biodiversity, Health, Economy AND Social impacts	-0,02	-0,02	0,09	0,05	0,09	-0,03	0,01	-0,02	0,01	-0,01
Projects delivering at least three impact categories	0,00	0,01	0,05	0,03	0,01	0,00	-0,01	0,00	0,00	0,00
○ Climate Change, Biodiversity And Health	-0,01	0,00	0,06	0,05	0,02	-0,01	-0,01	-0,02	0,00	-0,01
○ Climate Change, Biodiversity and Economy	0,01	0,02	0,08	0,01	0,05	-0,03	0,01	-0,03	0,00	0,00
○ Biodiversity, Health and Economy	-0,03	-0,03	0,05	0,03	0,01	0,01	0,01	0,01	0,00	-0,01
○ Climate Change, Health and Economy	0,02	0,01	0,08	0,07	0,08	-0,03	0,00	-0,01	0,00	-0,01

Table 47.Sources of funding used in projects with multiple goals and multiple impacts (variation from the overall results).

	EU funds	Public national budget	Public regional budget	Public local authority's budget	Corporate investment	Funds provided by non-	Private Foundation	Crowdfunding	Multilateral funds	Commercial banks
Climate Change, Biodiversity, Health and Economy	-0,09	0,00	0,17	0,15	0,09	-0,08	0,05	-0,06	0,00	-0,01
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	-0,05	0,08	0,32	0,46	0,19	-0,07	0,12	-0,06	0,00	-0,01
Projects delivering at least three goals and impacts categories	0,02	0,05	0,12	0,10	-0,02	0,00	0,00	0,01	0,00	-0,01
o Climate Change, Biodiversity And Health	0,02	0,02	0,13	0,14	-0,05	-0,02	0,01	-0,01	0,00	-0,01
o Climate Change, Biodiversity and Economy	-0,03	0,02	0,15	0,06	0,07	-0,09	0,03	-0,06	0,00	-0,01
o Biodiversity, Health and Economy	-0,06	0,00	0,17	0,10	0,00	0,02	0,06	0,06	0,00	-0,01
o Climate Change, Health and Economy	-0,02	0,08	0,11	0,14	0,11	-0,07	-0,01	-0,06	0,00	-0,01

3.3. Type of Financing

The following analysis focuses on the type of funds and the financing organisations used, or provided for the realization of the NBS projects.

From the 1000 European projects included in this analysis of the UNA data, the most commonly found type of financing is through direct funding or subsidies (56% of projects), followed closely by earmarked public budgets (51%). Innovative financing sources, such as membership fees, tax exemptions, equity funding, asset-backed funding are the least utilized (1% for all). Information regarding the type of financing was unknown for 14% of the projects.

Table 48. Type of financing utilised for the 1000 European NBS interventions included in the UNA.

Types of financing	Number of projects
Direct funding or subsidies	557
Earmarked public budget	511
Donations	108
Membership fees	25
Loan	13
Asset-backed funding (e.g. leasing)	9
Equity funding (investment in shares)	6
Tax exemption	5
Unknown	141

Several financing sources could be found within one project, as different types of funds could be used for the same project. The average number of financing types is 1.23 for the total sample (1000 NBS), while the average for projects that targeted four sustainability goals is 1.47, and 1.37 for projects that address at least three goals. The average number of types of financing are also higher for the samples of projects that report delivering impacts across four impact categories (1.41), at least three impact categories (1.55), compared with the total sample.

Table 49. Average number of types of funding used in projects with multiple goals and multiple impacts.

	Sustainability goals		Reported impacts	
	Average number of types of financing	Number of projects in the sample	Average number of types of financing	Number of projects in the sample
Climate Change, Biodiversity, Health and Economy	1,47	57	1,41	134
Projects addressing at least three goals	1,37	254	1,55	464

As mentioned earlier, direct funding and earmarked public budgets are the most significant types of financing mechanisms, and the same applies for the samples of projects that target several goals and deliver multiple impacts. Projects that addressed several goals and delivered multiple impacts have higher values of occurrence of these two types of financing mechanisms, compared to the total sample of projects.

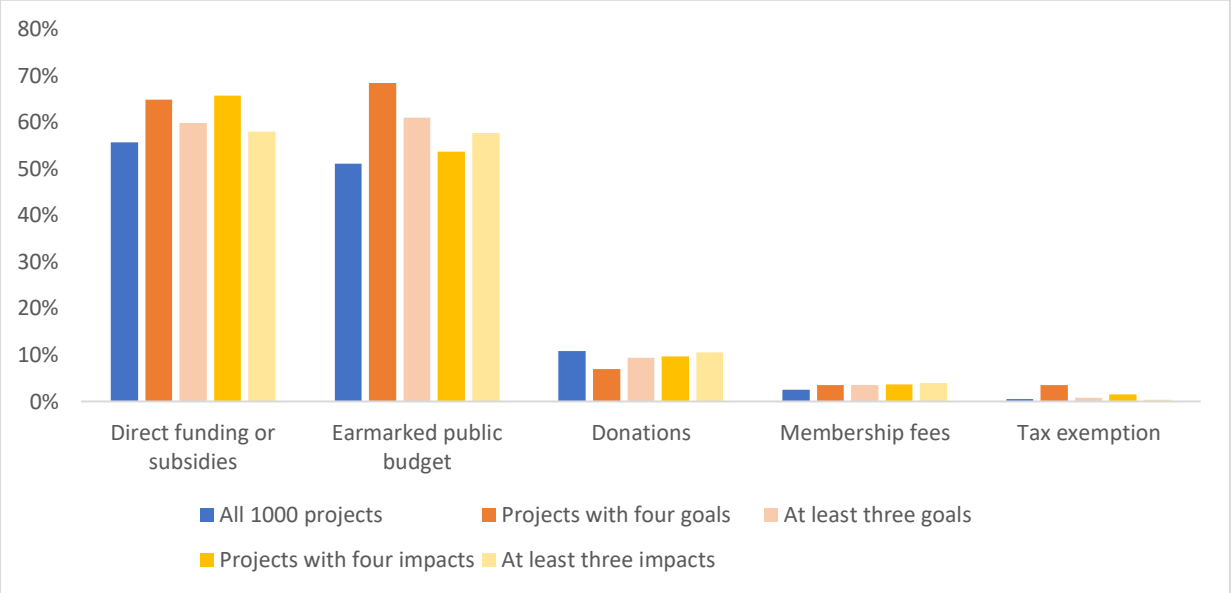


Figure 19. Comparison of the financial sources of all European projects and projects with multiple goals and impacts

Box 9: Hellenikon Metropolitan Park (Athens, Greece)

An ongoing project in Greece, the Hellinikon park aims to provide Athens with a much-needed ecological boost. Once completed, the project will be approximately 200 hectares, created in the former site of the Hellenikon International Airport.

The objectives of the project are focused on providing Athens with better air quality, attracting investment and tourists, planting more than 33,000 trees and 565,000 low vegetation, to make use of renewable sources of energy with green construction and bioclimatic solutions, and to protect and enhance the ecosystems in the region, while also raising awareness and educating the public on sustainability issues. The implementation team includes Foster & Partners, Charles Anderson

Landscape Architecture, ARUP and a group of Greek design consultants, with the revision of the design being the responsibility of the Greek government and under the consideration of the Greek Ministry of Culture for infrastructure and monuments. The project proposal competition was sponsored by the International Union of Architects, the Greek Ministry of Environment and the Organization for the Planning and Environmental Protection of Athens (ORSA).

With a projected cost of 7 billion Euros, the initiative in funded through corporate investment and private foundations/trusts, involving direct funding, tax exemptions, and private donations. This amount of funds being poured into this specific project is referred to as being the largest private investment ever made in Greece.

Source: https://una.city/nbs/athens/hellenikon-metropolitan-park

The detailed analysis of projects with multiple goals indicates that:

- Projects that aimed to address the four sustainability goals are most commonly supported by earmarked public budgets, and direct funding. Such projects are less likely to be backed by donations, loans, equity funding or asset-backed funding.
- As the most common financing mechanism, earmarked public budgets support the promotion of projects that address multiple goals (all combinations), and seems to be particularly relevant for climate-related projects.
- Donations as a financing mechanism doesn't seem conducive to the implementation of projects that tackle multiple goals, however it seems to be somewhat relevant for projects that address biodiversity, health and economy simultaneously.

Table 50. Types of financing used in projects addressing multiple goals (variation from the overall sample).

	Earmarked public budget	Direct funding or subsidies	Loan	Equity funding (investment	Asset-backed funding	Tax exemption	Donations	Membership fees
Climate Change, Biodiversity, Health and Economy	0,17	0,09	-0,01	-0,01	-0,01	0,03	-0,04	0,01
Climate Change, Biodiversity, Health, Economy AND Social Goals	0,20	0,04	-0,01	-0,01	-0,01	-0,01	-0,04	0,00
Projects addressing at least three goals	0,10	0,04	-0,01	0,00	-0,01	0,00	-0,01	0,01
○ Climate Change, Biodiversity And Health	0,14	0,09	-0,01	-0,01	-0,01	0,01	-0,03	0,02
○ Climate Change, Biodiversity and Economy	0,18	0,07	-0,01	-0,01	-0,01	0,03	-0,05	0,01
○ Biodiversity, Health and Economy	0,09	0,04	-0,01	0,00	0,00	0,01	0,04	0,01
○ Climate Change, Health and Economy	0,11	0,03	0,00	0,00	-0,01	0,01	-0,06	-0,01

The detailed analysis of projects with multiple impacts indicates that:

- Within projects that report the delivery of five and four project impacts, the most significant type of financing is direct funding or subsidies, and to a lesser extent, earmarked public budgets. Additionally, these projects are unlikely to be supported by donations, loans, equity funding or asset-backed funding.
- A similar situation is observed for projects that report the delivery of at least three impact categories, although with a reversed order, with earmarked public budgets as the most commonly observed financing mechanism.

Table 51. Types of financing used in projects delivering multiple impacts (variation from the overall sample).

	Earmarked public budget	Direct funding or subsidies	Loan	Equity funding	Asset-backed funding	Tax exemption	Donations	Membership fees
Climate Change, Biodiversity, Health and Economy	0,03	0,10	-0,01	0,00	0,00	0,01	-0,01	0,01
Climate Change, Biodiversity, Health, Economy AND Social Goals	0,02	0,11	-0,01	0,00	0,00	0,01	0,00	0,02
Projects delivering at least three impact categories	0,07	0,02	0,00	0,00	0,00	0,00	0,00	0,01
○ Climate Change, Biodiversity And Health	0,08	0,04	-0,01	0,00	-0,01	0,00	-0,01	0,01
○ Climate Change, Biodiversity and Economy	0,01	0,09	-0,01	0,00	0,00	0,01	-0,02	0,00
○ Biodiversity, Health and Economy	0,02	0,04	-0,01	0,00	0,00	0,00	0,01	0,02
○ Climate Change, Health and Economy	0,07	0,08	0,00	0,01	0,00	0,01	-0,02	0,02

Table 52. Types of financing used in projects with multiple goals and multiple impacts (variation from the overall results).

	Earmarked public budget	Direct funding or subsidies	Loan	Equity funding	Asset-backed funding	Tax exemption	Donations	Membership fees
Climate Change, Biodiversity, Health and Economy	0,10	0,11	-0,01	-0,01	-0,01	0,06	-0,05	0,04
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,23	0,40	-0,01	-0,01	-0,01	0,08	-0,02	0,06
Projects delivering at least three goals and impacts categories	0,11	0,08	-0,01	0,00	-0,01	0,01	0,01	0,02
o Climate Change, Biodiversity And Health	0,14	0,12	0,00	-0,01	-0,01	0,01	-0,02	0,04
o Climate Change, Biodiversity and Economy	0,10	0,08	-0,01	-0,01	-0,01	0,05	-0,06	0,03
o Biodiversity, Health and Economy	0,05	0,08	-0,01	0,01	-0,01	0,02	0,08	0,03
o Climate Change, Health and Economy	0,11	0,05	-0,01	-0,01	-0,01	0,03	-0,06	0,01

3.4. Non-financial Contributions

Besides financial resources that support NBS implementation, NBS interventions can also be sustained through non-financial contributions. These can be related with the various provision of resources or services, such as:

- Provision of land
- Provision of goods
- Provision of services and labour
- Provision of tools and technology
- Provision of knowledge

In the total sample of European NBS projects, 36% report the provision of some type of non-financial contribution. However, this information remains unknown for most projects (55%).

Projects which targeted multiple goals were less likely to involve non-financial contributions when compared with the total number of projects.

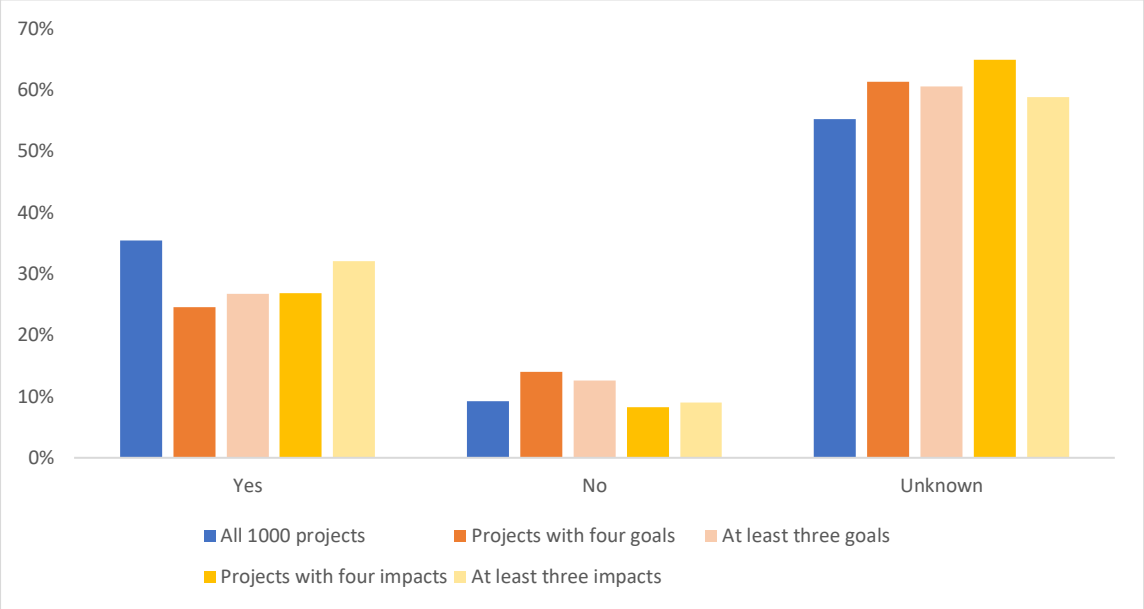


Figure 20. Comparison of non-financial contributions of all European projects and projects with multiple goals and impacts

Different types of non-financial contributions can be found in one project simultaneously. The average number non-financial contribution types is 2.18, when non-financial contributions are included. The average for projects that target four sustainability goals is 2.29, and 2.18 for projects that address at least three goals. The average number of types of financing are lower for the samples of projects that report delivering impacts across four impact categories (1.94), at least three impact categories (2.09), comparing with the total sample.

Table 53. Average number of instances with non-financial contributions in projects with multiple goals and multiple impacts

	Sustainability goals		Delivered impacts	
	Average number of types of financing	Number of projects in the sample	Average number of types of financing	Number of projects in the sample
Climate Change, Biodiversity, Health and Economy	2,29	14	1,94	36
At least three impacts	2,18	68	2,09	149

Regarding the types of non-financial contributions, the most common are provision of labour, land and goods. However, the inclusion of these forms of contributions are found less commonly in projects that aim to address multiple goals and to report multiple impacts, when compared with the non-financial contribution identified in the total sample. The provision of other services or exchange of services is negligeable.

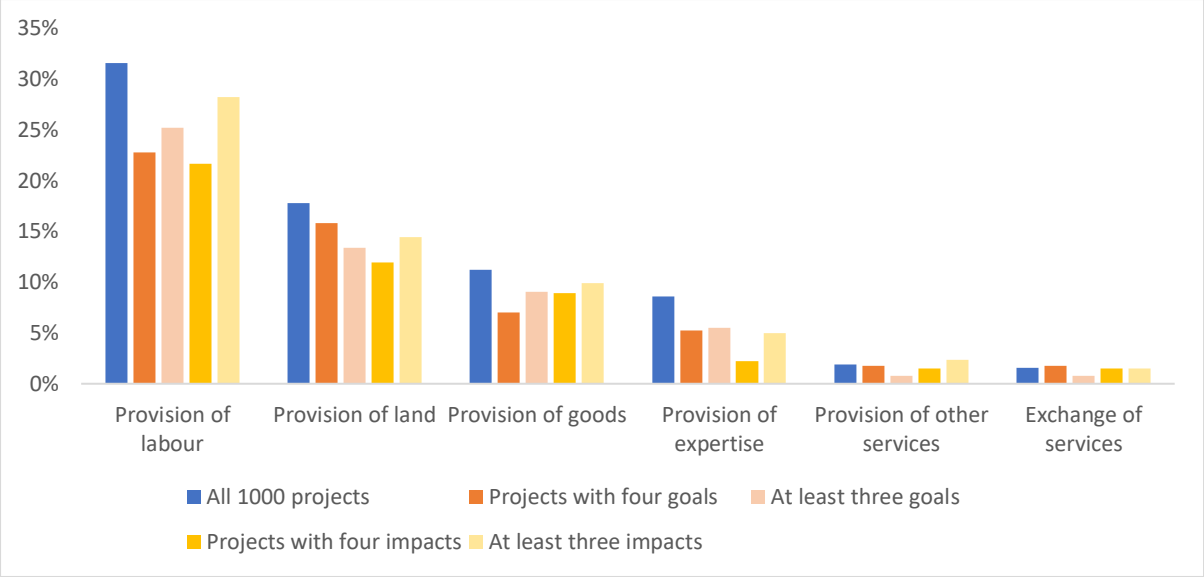


Figure 21. Comparison of non-financial contribution types of all European projects and projects with multiple goals and impacts

In terms of the analysis of the actors who provide the non-financial contributions, in the total sample of projects, the most common are citizens (through volunteering) (27% of all projects), followed by public authorities (e.g. land, utility services) (16%), and the least identified source is the private sector (businesses, financial institution) (5%).

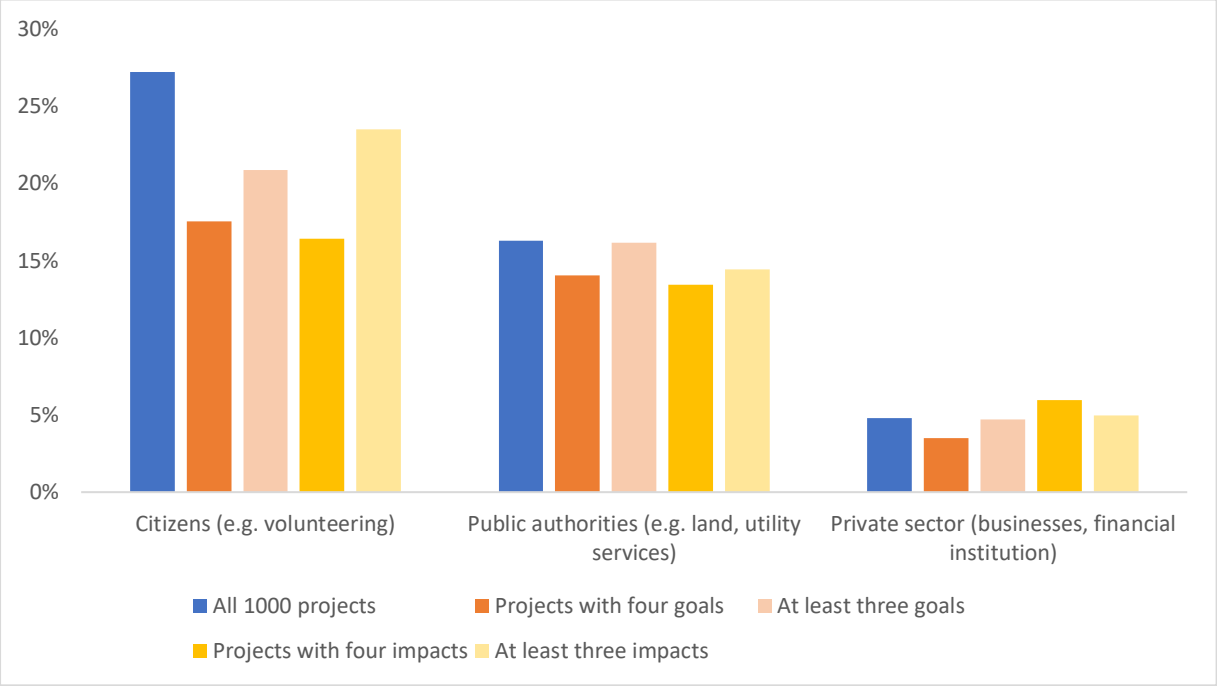


Figure 22. Comparison of non-financial contributions providers of all European projects and projects with multiple goals and impacts

Box 10: Green interventions for Cibali forest (Catania, Italy)

In Catania, the association "Legambiente Catania" presented an NBS project that aims at protecting and enhancing the biodiversity of the Cibali forest, considered as a natural reserve neighbouring the volcano Etna. In the last decades, this area has been subjected to strong anthropogenic pressures,

with detrimental implications for local species of flora and fauna. The project thus focuses on protecting endangered species and preserving the ecosystem services provided by the forest, namely air quality regulation and heat mitigation.

The project involves the protection of one of the few natural areas in the Cibali neighbourhood, through the regeneration of the forest with the plantation of different trees and plants.The exclusive source of funding within this project is the public local authority budget, with a total cost of 74,000 EUR. However, besides this financing instrument, the project also includes several forms of non-financial contributions. With the support of local citizens and public authorities, land, goods and labour are being provided to contribute to the re-forestation efforts through locals participatory activities.

In terms of projected impacts, the green area in the park will cover 600,000m2, through the overall goal is to plant more than 33,000 trees. As expected impacts, the area will regulate the micro-climate of the region reducing the high temperatures in summer, and the overall project is expected to generate 75,000 jobs and contribute to 2.4% of the national GDP. Also, with its 50 km of upcoming path networks, the park will also provide an attraction for pedestrians and cyclists, allowing for recreational and physical activities to take place.

Source: https://una.city/nbs/catania/green-interventions-cibali-forest

Non-financial contribution in case of projects addressing multiple goals:

- Projects that address multiple goals are less frequently receive any form of non-financial contribution. However, non-financial contributions seem to be included more often in projects that aim to tackle biodiversity, health and economy simultaneously.
- Regarding the types of non-financial contributions, projects that aim to address multiple goals do not seem likely to use non-financial contributions, however provision of land and goods are more likely to be involved in projects that aim to address biodiversity, health and economy simultaneously.

Table 54. Variation of presence of non-financial contribution used in projects addressing multiple goals (variation from the overall sample).

	Yes	No	Unknown
Climate Change, Biodiversity, Health and Economy	-0,11	0,05	0,06
Climate Change, Biodiversity, Health, Economy AND Social Goals	-0,07	0,04	0,02
Projects addressing at least three goals	-0,09	0,03	0,05
○ Climate Change, Biodiversity And Health	-0,09	0,03	0,06
○ Climate Change, Biodiversity and Economy	-0,12	0,03	0,09
○ Biodiversity, Health and Economy	0,01	0,01	-0,03
○ Climate Change, Health and Economy	-0,19	0,09	0,11

Table 55. Variation of types of non-financial contributions used in projects addressing multiple goals (variation from the overall sample).

	Provision of land	Provision of goods	Provision of labour	Provision of expertise	Provision of other services	Exchange of services
Climate Change, Biodiversity, Health and Economy	-0,02	-0,04	-0,09	-0,03	0,00	0,00
Climate Change, Biodiversity, Health, Economy AND Social Goals	0,02	-0,02	-0,03	-0,04	0,00	0,01
Projects addressing at least three goals	-0,04	-0,02	-0,06	-0,03	-0,01	-0,01
○ Climate Change, Biodiversity And Health	-0,06	-0,05	-0,06	-0,03	-0,01	-0,01
○ Climate Change, Biodiversity and Economy	-0,04	-0,05	-0,10	-0,04	0,00	0,00

○ Biodiversity, Health and Economy	0,06	0,05	0,01	-0,03	-0,01	0,00
○ Climate Change, Health and Economy	-0,08	-0,06	-0,16	-0,04	-0,01	-0,01

Non-financial contribution in case of projects delivering multiple impacts:

- Non-financial contribution seems to be in negative correlation with multiple impact delivery. However, non-financial contributions seem to be included more often in projects that aim to tackle biodiversity, health and economy simultaneously.

Table 56. Variation of non-financial contributions used in projects delivering multiple impacts (variation from the overall sample).

	Yes	No	Unknown
Climate Change, Biodiversity, Health and Economy	-0,09	-0,01	0,10
Climate Change, Biodiversity, Health, Economy AND Social Impacts	-0,09	-0,01	0,10
Projects delivering at least three impact categories	-0,03	0,00	0,04
○ Climate Change, Biodiversity And Health	-0,08	0,00	0,08
○ Climate Change, Biodiversity and Economy	-0,08	-0,01	0,09
○ Biodiversity, Health and Economy	0,01	-0,02	0,01
○ Climate Change, Health and Economy	-0,09	0,01	0,08

Table 57. Variation of types of non-financial contributions used in projects delivering multiple impacts (variation from the overall sample).

	Provision of land	Provision of goods	Provision of labour	Provision of expertise	Provision of other services	Exchange of services
Climate Change, Biodiversity, Health and Economy	-0,06	-0,02	-0,10	-0,06	0,00	0,00
Climate Change, Biodiversity, Health, Economy and Social Impacts	-0,06	-0,03	-0,10	-0,06	0,00	0,00
Projects delivering at least three impact categories	-0,03	-0,01	-0,03	-0,04	0,00	0,00
○ Climate Change, Biodiversity And Health	-0,08	-0,04	-0,08	-0,05	0,00	-0,01
○ Climate Change, Biodiversity and Economy	-0,06	-0,01	-0,09	-0,06	-0,01	0,00
○ Biodiversity, Health and Economy	0,02	0,02	0,00	-0,03	0,01	0,01
○ Climate Change, Health and Economy	-0,07	-0,03	-0,11	-0,06	-0,01	0,00

Table 58.Variation of non-financial contributions used in projects with multiple goals and multiple impacts (variation from the overall results).

	Yes	No	Unknown
Climate Change, Biodiversity, Health and Economy	-0,14	0,00	0,14
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	-0,14	-0,05	0,19
Projects delivering at least three goals and impacts categories	-0,09	-0,01	0,10
o Climate Change, Biodiversity And Health	-0,10	-0,01	0,10
o Climate Change, Biodiversity and Economy	-0,15	-0,02	0,16
o Biodiversity, Health and Economy	-0,01	-0,03	0,04
o Climate Change, Health and Economy	-0,21	0,03	0,18

Table 59.Variation of types of non-financial contributions used in projects with multiple goals and multiple impacts (variation from the overall results).

	Provision of land	Provision of goods	Provision of labour	Provision of expertise	Provision of other services	Exchange of services
Climate Change, Biodiversity, Health and Economy	-0,03	-0,05	-0,10	-0,09	0,01	0,01
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,00	-0,03	-0,01	-0,09	0,02	0,03
Projects delivering at least three goals and impacts categories	-0,06	-0,03	-0,07	-0,05	-0,01	0,00
o Climate Change, Biodiversity And Health	-0,08	-0,06	-0,07	-0,05	0,00	-0,01
o Climate Change, Biodiversity and Economy	-0,05	-0,06	-0,11	-0,09	0,01	0,01
o Biodiversity, Health and Economy	0,05	0,05	0,00	-0,07	0,00	0,01
o Climate Change, Health and Economy	-0,10	-0,08	-0,19	-0,05	0,00	0,00

Q4: What actors are involved in these initiatives?

In this section we provide an analysis of the governance characteristics of those NBS projects that address multiple goals or deliver multiple impacts. The following aspects will be covered:

- Management set-up (government-led, non-government or hybrid
- Role of private organisations and NGOs in governance
- Initiator of project implementation
- Stakeholders involved
- Type of stakeholder processes
- Business models that drive the implementation (based on Naturvation categorisation)

4.1. Governance arrangement

For the purposes of the NBS characterization, the UNA distinguishes the following type of governance arrangements:

- government-led
- projects led by non-government actors
- co-governance

The majority of the NBS projects (45%) in Europe are implemented in co-governance settings, when governmental and non-governmental organisations work together. Projects that set multiple goals are more often to be government-led or cogoverned. At the same time, government-led projects perform below average in delivering projects with multiple impacts. Non-profit organisations were less likely to have projects that set multiple goals but performed better on implementing projects with multiple impacts.

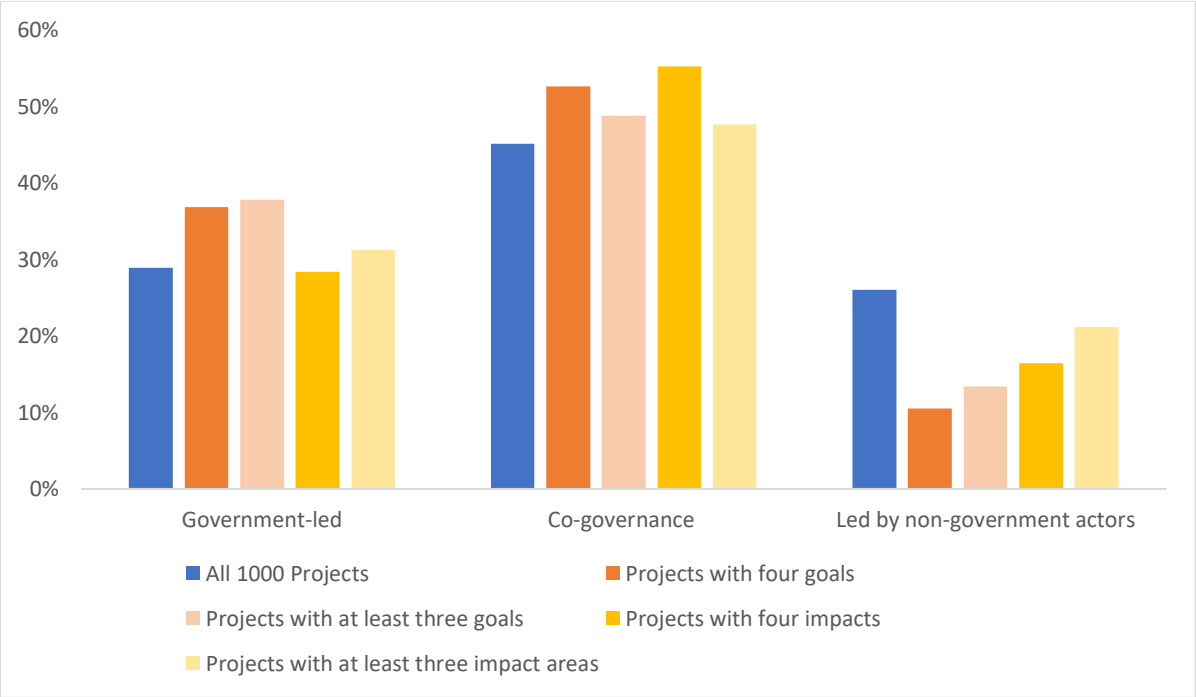


Figure 23: Governance arrangements of UNA projects

Box 11: Farming in the city (Malmo, Sweden)

The project titled “farming in the city” (*Odla i stan*) aims to promote sustainable urban farming that involves residents, associations, property owners and city administrations in the long-term. The project also collaborates with educational farming initiatives at schools and in Malmö Museums (*Malmö Museer*), as a means for increasing social community while providing self-produced food.

Led by non-government actors, the project involves the collaboration of several actors including citizens and citizen groups (e.g. Tenants' Association), property owners (e.g. MKB, *Brf Sofielund, Willhem*), public institutional offices from the city of Malmö (e.g. schools / preschools, service management, street office, cultural administration, museum), Region Skåne (e.g s*kånetrafiken*), and universities (e.g. SLU). The initiative organizes and coordinates organic farming in the urban environment, through implementing different organic methods and using local resources. In a collaborative effort among property owner “*Bostads AB Gröningen*” and the Tenants' Association, fruit trees, berry bushes, lots of different vegetables, and herbs and spices were grown by children and residents. Beekeeping is also an element of the project to improve pollination capacity and support urban biodiversity. Additionally, urban farming is seen as an excellent way to increase social interaction and strengthen a sense of community, while providing sustainable self-produced food.

Source: https://una.city/nbs/malmo/farming-city

- The detailed analysis of these projects indicates that co-governance settings are more likely when climate change and health goals are established.
- Projects implemented by non-governmental actors are the least likely to address climate change and biodiversity goals.

Table 60. Governance arrangements used in projects addressing multiple goals - variation from the overall sample.

	Government-led	**Co-governance**	**Led by non-government actors**
Climate Change, Biodiversity, Health and Economy	0.08	0.08	-0.15
Climate Change, Biodiversity, Health, Economy and Social Goals	0.09	0.06	-0.15
Projects addressing at least three goals	0.09	0.04	-0.13
○ Climate Change, Biodiversity And Health	0.10	0.05	-0.15
○ Climate Change, Biodiversity and Economy	0.06	0.10	-0.17
○ Biodiversity, Health and Economy	0.10	0.02	-0.11
○ Climate Change, Health and Economy	0.06	0.07	-0.13

- Although government-led projects more frequently set multiple goals concerning climate change, biodiversity, health and economic development, they are performing below the average in impact delivery and are especially less likely to deliver economic impacts.
- Co-governed projects also perform well in delivering multiple impacts, and are especially successful in implementing projects with climate change impacts.

Table 61. Types of governance arrangements used in projects delivering multiple impacts - variation from the overall sample.

	Government-led	Co-governance	Led by non-government actors
Climate Change, Biodiversity, Health and Economy	-0.01	0.10	-0.10
Climate Change, Biodiversity, Health, Economy AND Social impacts	-0.01	0.11	-0.10
Projects delivering at least three impact categories	0.02	0.03	-0.05
○ Climate Change, Biodiversity And Health	0.04	0.05	-0.08
○ Climate Change, Biodiversity and Economy	0.00	0.07	-0.07
○ Biodiversity, Health and Economy	-0.01	0.04	-0.03
○ Climate Change, Health and Economy	0.00	0.10	-0.10

Table 62: Types of governance arrangements used in projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	Government-led	Co-governance	Led by non-government actors
Climate Change, Biodiversity, Health and Economy	-0.02	0.19	-0.17
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0.02	0.20	-0.22
Projects delivering at least three goal and impact categories	0.08	0.06	-0.14
○ Climate Change, Biodiversity And Health	0.04	0.12	-0.17
○ Climate Change, Biodiversity and Economy	-0.03	0.22	-0.18
○ Biodiversity, Health and Economy	0.07	0.03	-0.10
○ Climate Change, Health and Economy	0.05	0.10	-0.15

4.2. Role of private organisations and NGOs in governance

NBS projects can involve various non-governmental actors in governance and implementation. These can include:

- Public sector institution
- Non-governmental organizations (NGOs)
- Private sector organisation/Corporate actor/Business
- Researchers/Universities
- Citizens or community groups
- Financial institutions
- Social enterprise

Almost one/third of all NBS projects involved private sector organisations and citizen groups and NGOs were also included in more than 25% of all European NBS projects.

Table 63. Non-governmental actors involved in the European NBS projects included in the UNA.

Type of actor	Number of projects
Private sector/Corporate/Business	311
Citizens or community groups	266
Non-governmental organisation (NGO)	260
Researchers, university	140
Public sector institution (e.g. school or hospital)	110
Social enterprise	9
Financial institution (e.g. bank, insurer, pension fund)	2

NGOs and citizens groups were less often involved in projects that set multiple goals or delivered multiple impacts, while private sector organisations were somewhat more likely to be involved in such projects.

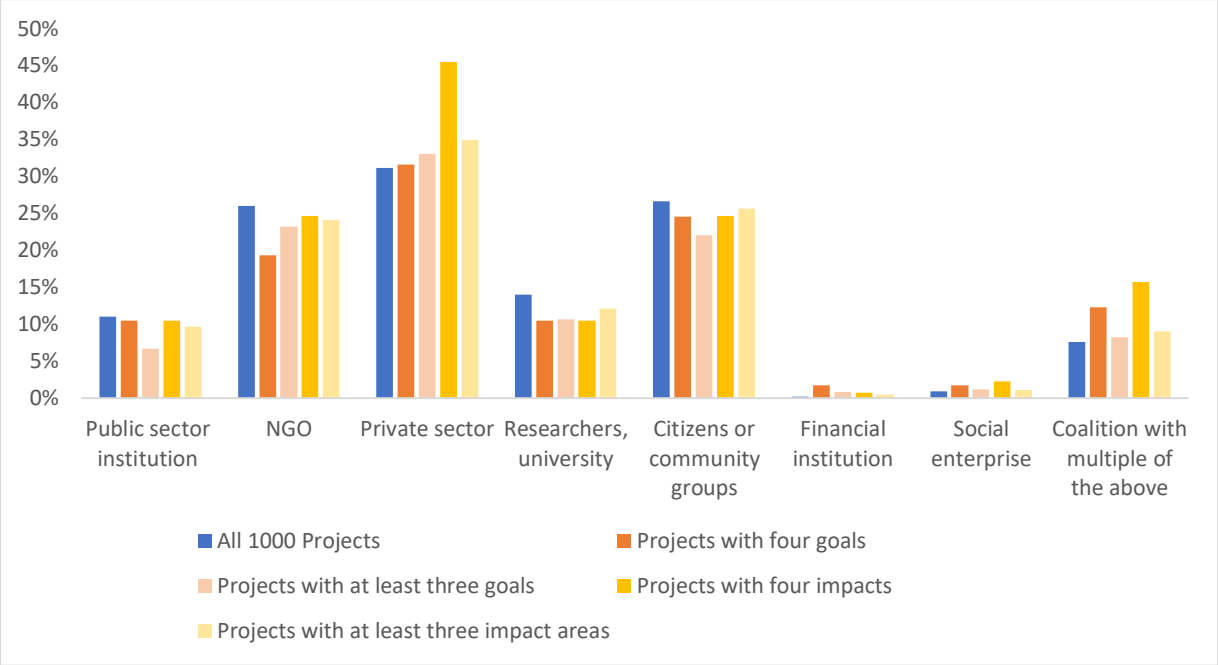


Figure 24: Involvement of non-governmental actors in the UNA project development and management

Box 12: Green Roof Courtyard (Stuttgart, Germany)

In Stuttgart, private company WGV-Insurance, installed across four courtyards an extensive green roof area of approx. 2,000 m² and a total of 58 small crowned trees to tackle climate pressures and satisfy its employees and customers. The project also aimed at reducing air conditioning costs and heating demands in winter, improving air quality, while creating an aesthetically working environment for a better appreciation of the company's office spaces.

Led by non-government actors, this project included a variety of stakeholders from the private sector. The architecture and design aspects of the roof garden were completed by Kunder³ Landscape Architecture (Stuttgart), with contributions from Uecker + Pfaff GmbH, Stuttgart and Garten Moser GmbH & Co. KG, Reutlingen. The green roof technological systems were installed by the ZinCo Company.

Source: https://una.city/nbs/stuttgart/green-roof-courtyard

Findings about projects that set multiple goals:

- Projects were less likely to involve non-governmental organisations and community groups in the management of projects compared to the overall sample.
- Public sector institutions and research organisations were also less likely to appear as the governance bodies of NBS delivering multiple goals.
- The only exceptions are private sector organisations, when climate change goals were established.

Table 64. Non-governmental actors involved in projects addressing multiple goals - variation from the overall sample.

	Public sector institution	Non-governmental organisation	Private sector, Corporate Business	Researchers, university	Citizens or community groups	Financial institution	Social enterprise
Climate Change, Biodiversity, Health and Economy	0.00	-0.07	0.00	-0.03	-0.02	0.02	0.01
Climate Change, Biodiversity, Health, Economy AND Social Goals	-0.02	-0.04	-0.07	-0.07	-0.02	0.02	0.01
Projects addressing at least three goals	-0.04	-0.03	0.02	-0.03	-0.05	0.01	0.00
○ Climate Change, Biodiversity And Health	-0.04	-0.03	-0.02	-0.01	-0.02	0.00	0.00
○ Climate Change, Biodiversity and Economy	0.01	-0.06	0.03	0.00	-0.04	0.01	0.02
○ Biodiversity, Health and Economy	-0.03	0.02	-0.05	-0.06	-0.04	0.01	0.00
○ Climate Change, Health and Economy	-0.03	-0.11	0.11	-0.06	-0.05	0.02	0.00

Findings about projects delivering multiple impacts:

- Projects were less likely to involve non-governmental actors compared to the overall sample.
- The only exception are private sector organisations. Projects that involved private sector organisations in the management of NBS projects, were more likely to deliver impacts across the different samples.

Table 65. Non-governmental actors involved in projects delivering multiple impacts - variation from the overall sample.

	Public sector institution	Non-governmental organisation	Private sector, Corporate Business	Researchers, university	Citizens or community groups	Financial institution	Social enterprise
Climate Change, Biodiversity, Health and Economy	-0.01	-0.01	0.14	-0.04	-0.02	0.01	0.01
Climate Change, Biodiversity, Health, Economy AND Social impacts	-0.02	-0.02	0.17	-0.04	-0.01	0.01	0.01
Projects delivering at least three impact categories	-0.02	-0.03	0.06	-0.02	-0.03	0.00	0.00
Climate Change, Biodiversity And Health	0.00	-0.01	0.12	-0.02	-0.03	0.00	0.02
Climate Change, Biodiversity and Economy	-0.01	0.02	0.05	-0.04	0.01	0.00	0.00
Biodiversity, Health and Economy	-0.01	-0.05	0.15	-0.04	-0.02	0.01	0.01
Climate Change, Health and Economy	-0.01	-0.02	0.04	-0.02	-0.01	0.00	0.00

Table 66: Non-governmental actors involved in projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	Public sector institution	Non-governmental organisation	Private sector, Corporate Business	Researchers, university	Citizens or community groups	Financial institution	Social enterprise
Climate Change, Biodiversity, Health and Economy	-0.05	-0.05	0.14	-0.05	-0.02	0.03	0.02
Climate Change, Biodiversity, Health, Economy AND Social impacts	-0.02	0.00	0.08	-0.10	-0.01	0.04	0.03
Projects delivering at least three goals and impact categories	-0.03	-0.01	0.01	-0.02	-0.03	0.01	0.01
Climate Change, Biodiversity And Health	-0.04	0.00	-0.01	0.00	0.00	0.01	0.01
Climate Change, Biodiversity and Economy	-0.01	-0.03	0.15	-0.04	-0.04	0.02	0.04
Biodiversity, Health and Economy	-0.05	0.03	0.01	-0.07	-0.03	0.01	0.01
Climate Change, Health and Economy	-0.05	-0.12	0.17	-0.05	-0.06	0.03	0.01

4.3. Initiating organisation

NBS projects can be initiated by various actors. The majority of the projects in the European sample was initiated by local governments. 18% of the projects was established by NGOs, while an additional 18% was led by citizen groups.

Table 67. Initiating organization of the European NBS projects included in the UNA.

Type of actor	Number of projects
Local government / municipality	580
Non-government organisation / civil society	185
Citizens or Community groups	183
Private sector / Corporate / Company	156
Regional government	89
Researchers / University	85
National government	76
Public sector institution (e.g. school or hospital)	74
Private Foundation	45
District / neighbourhood association	37
EU bodies	15
Business association	13
Transnational network	6
Multilateral organisation	4
Social enterprise	4
Financial institution (e.g. bank, insurer, pension fund)	**2**

Our analysis suggests that projects that set multiple goals were more often initiated by local, regional or national governments. They were however less frequently initiated by NGOs or citizen groups.

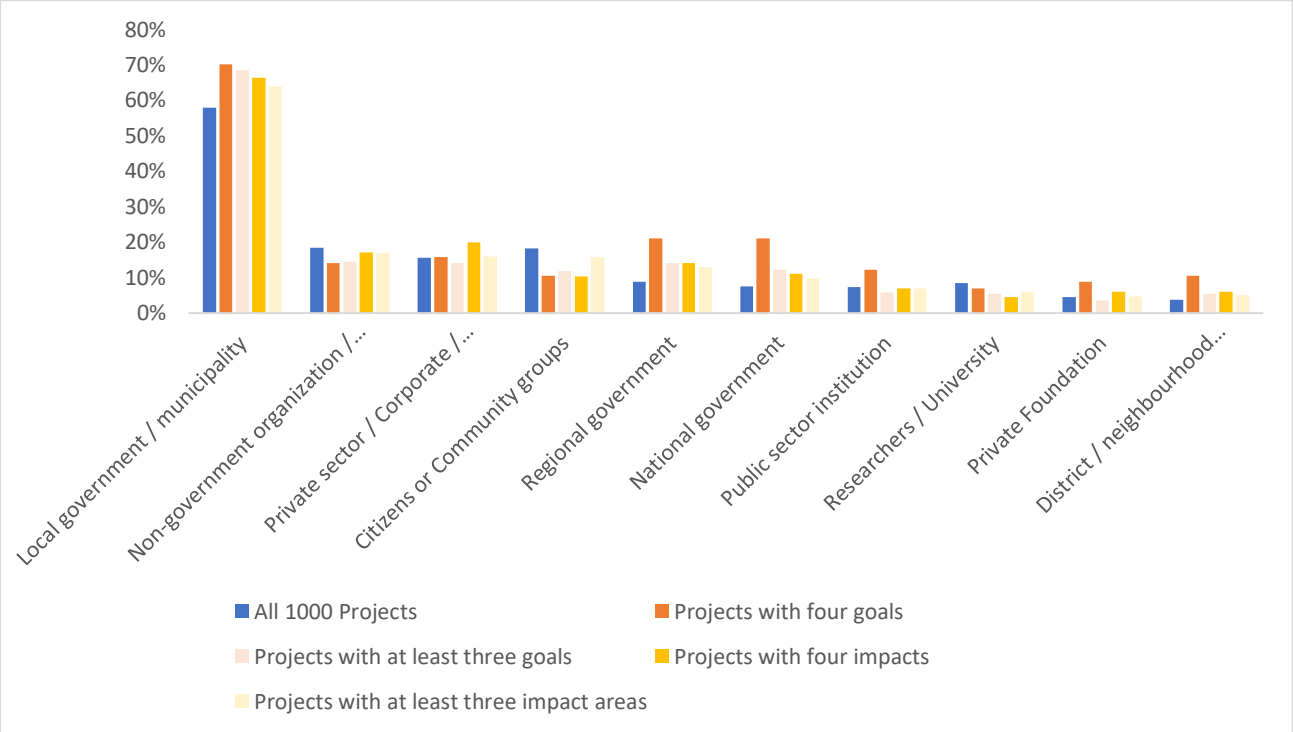


Figure 25. Key initiating actors of UNA projects

Box 13: The 100,000 trees project (Porto, Portugal)

The 100,000 Trees Project (FUTURO project) in the Porto Metropolitan Area intends to restore 100 hectares of urban forest with native tree species, as a planned and coordinated effort of various organizations and citizens. The project focus on maintaining and expanding the native urban forests in this region, in order to enrich its biodiversity, sequester carbon, improve air quality, protect the local soil and contribute to a better quality of life.
Another goal of the project focuses on nature education, by creating training opportunities and activities for citizens (e.g. volunteering program) to enhance people's awareness and al knowledge about local nature.

The FUTURO is an initiative of CRE.Porto (Regional Center for Excellence in Education for the Sustainable Development of the Porto Metropolitan Area), coordinated by the Porto Metropolitan Area and the Portuguese Catholic University (Porto). Several public and private entities actively participate in the FUTURE, offering institutional support and material and human resources to the project. Citizens and local community groups actively participate in the joint implementation of the project trough tree planting activities to expand the urban forest cover, as well as in dissemination of information and education, involving over 14.481 parents, children and professors (in 2018).

The project reported an increase in social interaction, and access to a new green space, by creating 174 ha of green space and including 85% of that space in the protected territory. A report from 2018 states that 9,877 tons of carbon are sequestered per year, and that 55 tons of atmospheric pollutants are removed from the atmosphere per year, with 0.67 tons of PM2.5 removed, decreasing air pollution in the city. The project also gained 4 national and international prizes related to the promotion of natural heritage and emphasizing its importance.

Source: https://una.city/nbs/porto/100000-trees-project

According to the detailed analysis of projects with multiple goals:

- Local governments were primarily interested in launching projects with climate change objectives.
- Regional and national governments more often initiated projects with biodiversity and economic development goals.
- Private sector organisations were more likely to launch projects with climate change and economic goals.

Table 68. Initiating organisations involved in projects addressing multiple goals (variation from the overall sample).

	Local government / municipality	***Non-government organisation / civil society***	***Private sector / Corporate / Company***	***Citizens or Community groups***	***Regional government***	***National government***	***Public sector institution***	***Researchers / University***	***Private Foundation***
Climate Change, Biodiversity, Health and Economy	0.12	-0.04	0.00	-0.08	0.12	0.13	0.05	-0.01	0.04

Climate Change, Biodiversity, Health, Economy AND Social Goals	0.18	-0.03	-0.04	-0.05	0.11	0.15	0.01	-0.02	0.04
Projects addressing at least three goals	0.11	-0.04	-0.01	-0.06	0.05	0.05	-0.01	-0.03	-0.01
○ Climate Change, Biodiversity And Health	0.14	-0.03	-0.04	-0.08	0.07	0.06	0.00	-0.02	0.00
○ Climate Change, Biodiversity and Economy	0.11	-0.05	-0.02	-0.08	0.11	0.12	0.05	-0.01	0.03
○ Biodiversity, Health and Economy	0.05	-0.02	-0.04	-0.04	0.11	0.10	0.02	-0.03	0.02
○ Climate Change, Health and Economy	0.13	-0.07	0.07	-0.09	0.05	0.07	-0.01	-0.04	0.00

According to the detailed analysis of projects with multiple impacts:

- Local municipalities were also more successful in implementing projects with multiple impacts.
- Although national and regional governments were more likely to initiate projects with multiple goals, they performed more poorly in delivering projects with multiple impacts.
- Projects initiated by private companies also had a good potential to deliver multiple impacts.

Table 69. Variation of the initiating organisations involved in projects delivering multiple impacts (variation from the overall sample).

	Local government / municipality	**Non-government organisation / civil society**	**Private sector / Corporate / Company**	**Citizens or Community groups**	**Regional government**	**National government**	**Public sector institution**	**Researchers / University**	**Private Foundation**
Climate Change, Biodiversity, Health and Economy	0.08	-0.01	0.05	-0.08	0.05	0.04	0.00	-0.04	0.01
Climate Change, Biodiversity, Health, Economy AND Social impacts	0.10	-0.02	0.06	-0.07	0.05	0.02	-0.01	-0.04	0.02
Projects delivering at least three impact categories	0.11	-0.01	0.02	-0.07	0.06	0.02	-0.01	-0.04	0.01
○ Climate Change, Biodiversity And Health	0.03	-0.01	0.04	-0.07	0.05	0.07	-0.01	-0.02	0.03
○ Climate Change, Biodiversity and Economy	0.03	-0.01	0.01	0.00	0.03	0.01	0.01	-0.03	0.00
○ Biodiversity, Health and Economy	0.11	-0.04	0.06	-0.07	0.05	0.04	-0.01	-0.03	0.00
○ Climate Change, Health and Economy	0.06	-0.01	0.01	-0.03	0.04	0.02	-0.01	-0.02	0.00

Table 70. Variation of the initiating organisations involved in projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	National government	**Regional government**	**Local government /**	**Public sector institution**	**Non-government organizatio**	**Private sector / Corporate /**	**Private Foundation**	**Researcher s / University**	**Citizens or Community groups**
Climate Change, Biodiversity, Health and Economy	0,14	0,18	0,12	0,02	0,03	0,06	0,08	-0,02	-0,06

Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,14	0,22	0,25	0,01	0,03	0,02	0,09	-0,04	-0,01
Projects delivering at least three goals and impacts categories	0,05	0,08	0,13	-0,01	-0,01	-0,02	0,00	-0,02	-0,08
o Climate Change, Biodiversity And Health	0,04	0,11	0,17	0,00	0,02	-0,04	0,02	-0,03	-0,07
o Climate Change, Biodiversity and Economy	0,13	0,17	0,09	0,00	0,02	0,02	0,06	-0,01	-0,08
o Biodiversity, Health and Economy	0,08	0,13	0,06	0,01	0,00	-0,03	0,04	-0,03	-0,04
o Climate Change, Health and Economy	0,11	0,10	0,14	-0,01	-0,04	0,11	0,02	-0,02	-0,10

4.4. Stakeholder processes

NBS projects can involve stakeholders in various ways. The most common form of stakeholder involvement across the European projects was information dissemination and consultation about the NBS projects. However, joint implementation and co-planning was also included in the implementation process for almost 30% of the projects.

Table 71. Stakeholder processes included in the European NBS projects included in the UNA.

Stakeholder processes	Number of projects
Dissemination of information and education	399
Consultation (e.g. workshop, surveys)	313
Joint implementation (e.g. tree planting)	298
Co-planning	283
Co-management/Joint management	181
Citizen oversight (e.g. boards, advisory)	104
Citizen monitoring and review	91
Crowd-sourcing/Crowd-funding/Participatory budget	89
Taskforce groups	79
Citizen science	38

Dissemination and consultation were more frequent in the case of projects, which set multiple goals or delivered multiple impacts. At the same time, they were less likely to implement more innovative forms of stakeholder processes, such as joint implementation, or co-planning. The only exception was citizen oversight, citizen monitoring and taskforce groups. Projects with multiple goals/impacts were somewhat more likely to involve such activities.

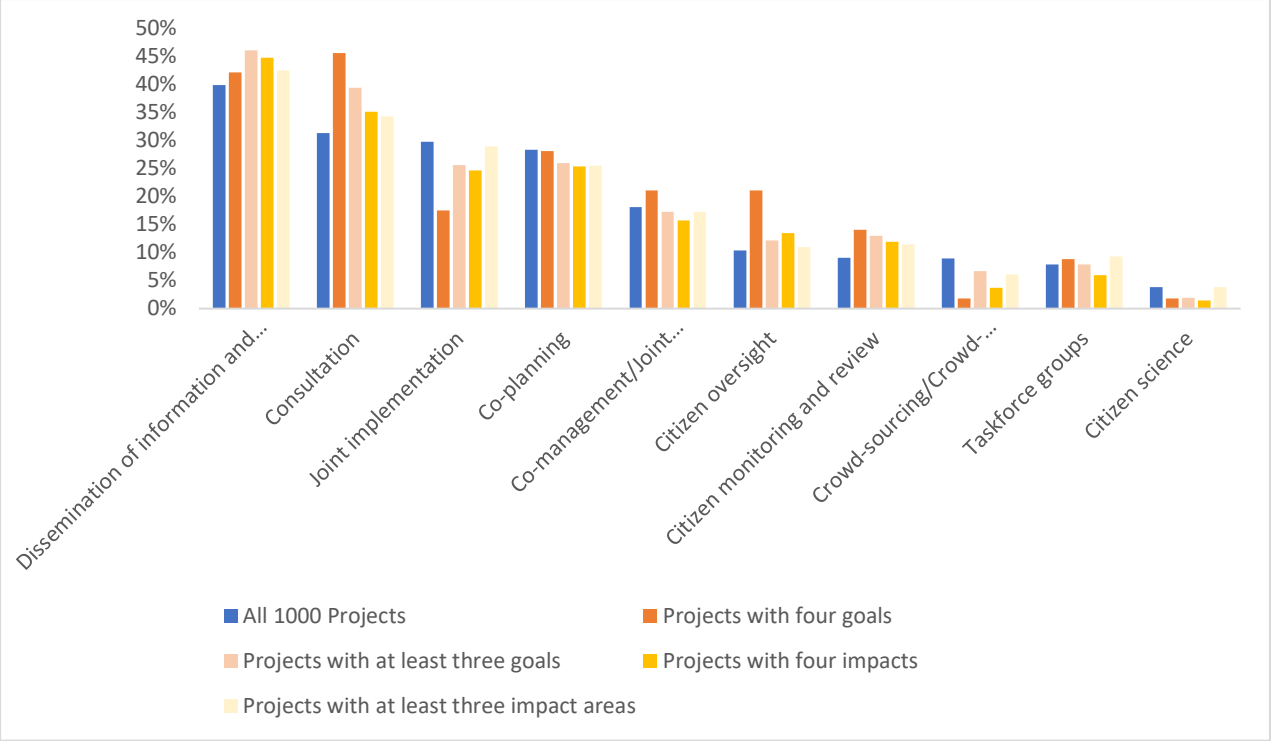


Figure 26: Stakeholder involvement processes of UNA projects

According to the detailed analysis of projects with multiple goals:

- Projects that had multiple goals less frequently considered joint implementation, co-planning and co-management processes.
- Processes where citizens were involved in monitoring the implementation were more frequent.

Box 14: Revitalization of 3 lakes (Poznan, Poland)

Poznan's lakes revitalization project focuses on the lakes of Kierskie, Strzeszynskie, and Rusalk. Besides the three lakes the project area includes a forest area of over 1000-ha located within the city borders, making this a unique recreational area for the inhabitants of Poznan and its surroundings.

The project aims to modernize the neglected beaches and build basic infrastructure and communication paths, with three specific goals in mind: (1) to revitalize the beaches of the three lakes in order to provide green recreational area; (2) to provide public sports facilities; (3) to promote healthy lifestyles and improve public well-being; (4) cleaning of the sites area and planting greenery.

The project has an innovative governance approach by having local citizens and community groups leading the revitalization project. Through different forms of community involvement (e.g. co-planning, consultation), several groups of the local community representatives developed the project idea and applied for funds from the Poznan participatory city budget. Through the support of the local government this citizen driven project successfully revitalized a large and previously decaying and rarely visited area with climate-oriented sustainable solutions.

The local community is considered to be satisfied with the project implementation, with further work activities planned for the future. The project revitalized decaying and unsafe beaches provided lighting and clean space for swimming and relaxation, as well as playgrounds and outdoor gyms that allow for physical activity.

Source: https://una.city/nbs/poznan/revitalization-3-lakes

Table 72. Variation of the stakeholder processes involved in projects addressing multiple goals (variation from the overall sample).

	Dissemination of information and education	Consultation (e.g. workshop, surveys)	Joint implementation (e.g. tree planting)	Co-planning	Co-management/Joint management	Citizen oversight (e.g. boards, advisory)	Citizen monitoring and review	Crowd-sourcing/Crowd-funding/Participatory budget	Taskforce groups	Citizen science
Climate Change, Biodiversity, Health and Economy	0.02	0.14	-0.12	0.00	0.03	0.11	0.05	-0.07	0.01	-0.02
Climate Change, Biodiversity, Health, Economy AND Social Goals	0.05	0.20	-0.10	0.01	0.06	0.14	0.06	-0.07	0.01	-0.02
Projects addressing at least three goals	0.06	0.08	-0.04	-0.02	-0.01	0.02	0.04	-0.02	0.00	-0.02
○ Climate Change, Biodiversity And Health	0.06	0.10	-0.07	-0.03	-0.02	0.02	0.03	-0.04	-0.01	-0.02
○ Climate Change, Biodiversity and Economy	0.03	0.12	-0.14	-0.02	0.00	0.08	0.03	-0.06	0.03	-0.02
○ Biodiversity, Health and Economy	0.10	0.12	0.03	0.03	0.07	0.08	0.09	-0.02	0.02	0.00
○ Climate Change, Health and Economy	-0.01	0.08	-0.15	-0.03	-0.02	0.06	0.01	-0.05	0.00	-0.03

According to the detailed analysis of projects delivering multiple impacts:

- Projects that delivered multiple impacts were less likely to include joint implementation, co-planning and co-management processes.
- Processes where citizens were involved in monitoring the implementation were more frequent.

Table 73. Variation of the stakeholder processes involved in projects delivering multiple impacts (variation from the overall sample).

	Dissemination of information and education	Consultation (e.g. workshop, surveys)	Joint implementation (e.g. tree planting)	Co-planning	Co-management/Joint management	Citizen oversight (e.g. boards, advisory)	Citizen science	Citizen monitoring and review	Crowd-sourcing/Crowd-funding/Participatory bdget	Taskforce groups
Climate Change, Biodiversity, Health and Economy	0.05	0.04	-0.05	-0.03	-0.02	0.03	-0.02	0.03	-0.05	-0.02

Climate Change, Biodiversity, Health, Economy AND Social impacts	0.07	0.05	-0.05	-0.03	-0.01	0.05	-0.04	0.05	-0.05	-0.03
Projects delivering at least three impact categories	0.03	0.03	-0.01	-0.03	-0.01	0.01	0.00	0.02	-0.03	0.01
○ Climate Change, Biodiversity And Health	0.03	0.03	-0.07	-0.06	-0.04	0.01	-0.01	0.02	-0.05	-0.02
○ Climate Change, Biodiversity and Economy	0.05	0.05	-0.02	-0.01	-0.02	0.01	-0.03	0.03	-0.05	0.02
○ Biodiversity, Health and Economy	0.04	0.02	0.04	-0.02	0.02	0.02	0.01	0.03	-0.02	0.01
○ Climate Change, Health and Economy	0.03	0.04	-0.07	-0.01	-0.02	0.03	-0.02	0.03	-0.04	0.00

Table 74.Variation of the stakeholder processes involved in projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	Co-planning	***Crowd-sourcing/Crowd-funding/Participat***	***Taskforce groups***	***Dissemination of information and education***	***Consultation (e.g. workshop, surveys)***	***Joint implementation (e.g. tree planting)***	***Co-management/ Joint management***	***Citizen oversight (e.g. boards, advisory)***	***Citizen science***	***Citizen monitoring and review***
Climate Change, Biodiversity, Health and Economy	-0,01	-0,09	-0,05	0,06	0,08	-0,15	0,03	0,14	-0,04	0,09
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,02	-0,09	-0,04	0,17	0,25	-0,17	0,08	0,20	-0,04	0,13
Projects delivering at least three goals and impacts categories	-0,03	-0,03	0,01	0,10	0,13	-0,03	0,00	0,02	-0,02	0,07
o Climate Change, Biodiversity And Health	-0,03	-0,05	-0,02	0,08	0,13	-0,07	-0,01	0,02	-0,02	0,06
o Climate Change, Biodiversity and Economy	-0,03	-0,09	0,00	0,06	0,10	-0,14	0,00	0,10	-0,04	0,06
o Biodiversity, Health and Economy	-0,01	0,00	-0,01	0,14	0,09	0,05	0,08	0,07	-0,01	0,13
o Climate Change, Health and Economy	-0,03	-0,09	0,00	0,04	0,11	-0,16	-0,02	0,11	-0,04	0,07

4.5. Stakeholders involved

Regarding the type of stakeholders, the most involved actors were local governments and citizens (79.3%) or community groups (65%). Private sector organisations, and NGOs were also more frequently involved.

Table 75. Type of stakeholders included in the European NBS projects included in the UNA.

Type of actor	Number of projects
Local government / municipality	793
Citizens or Community groups	652
Private sector / Corporate / Company	465

Non-government organisation / civil society	320
Researchers / University	233
Public sector institution (e.g. school or hospital)	214
Regional government	195
National government	192
EU bodies	130
Private Foundation	91
District / neighborhood association	61
Business association	38
Transnational network	22
Multilateral organisation	16
Financial institution (e.g. bank, insurer, pension fund)	8

European projects involved 3.56 different types of stakeholder groups at an average. Projects that set multiple goals involved somewhat more types of stakeholders. Projects involving a higher number of stakeholders were also more successful in delivering multiple impacts.

Table 76. Average number of stakeholder groups included in projects with multiple goals and multiple impacts.

	Sustainability goals		Delivered impacts	
	Average number of stakeholder groups involved	Number of projects in the sample	Average number of stakeholder groups involved	Number of projects in the sample
Climate Change, Biodiversity, Health and Economy	4.19	57	3.92	134
Climate Change, Biodiversity, Health, Economy AND Social Goals	4.36	45	4.00	115
Projects addressing at least three goals	3.99	254	3.80	464
Climate Change, Biodiversity And Health	4.07	151	3.91	274
Climate Change, Biodiversity and Economy	4.07	65	3.87	170
Biodiversity, Health and Economy	4.17	103	3.78	248
Climate Change, Health and Economy	3.92	106	3.86	174

The involvement of local, regional and national governments was more frequent in projects that set multiple goals or delivered multiple impacts. At the same time, community groups and NGOs were less frequently involved.

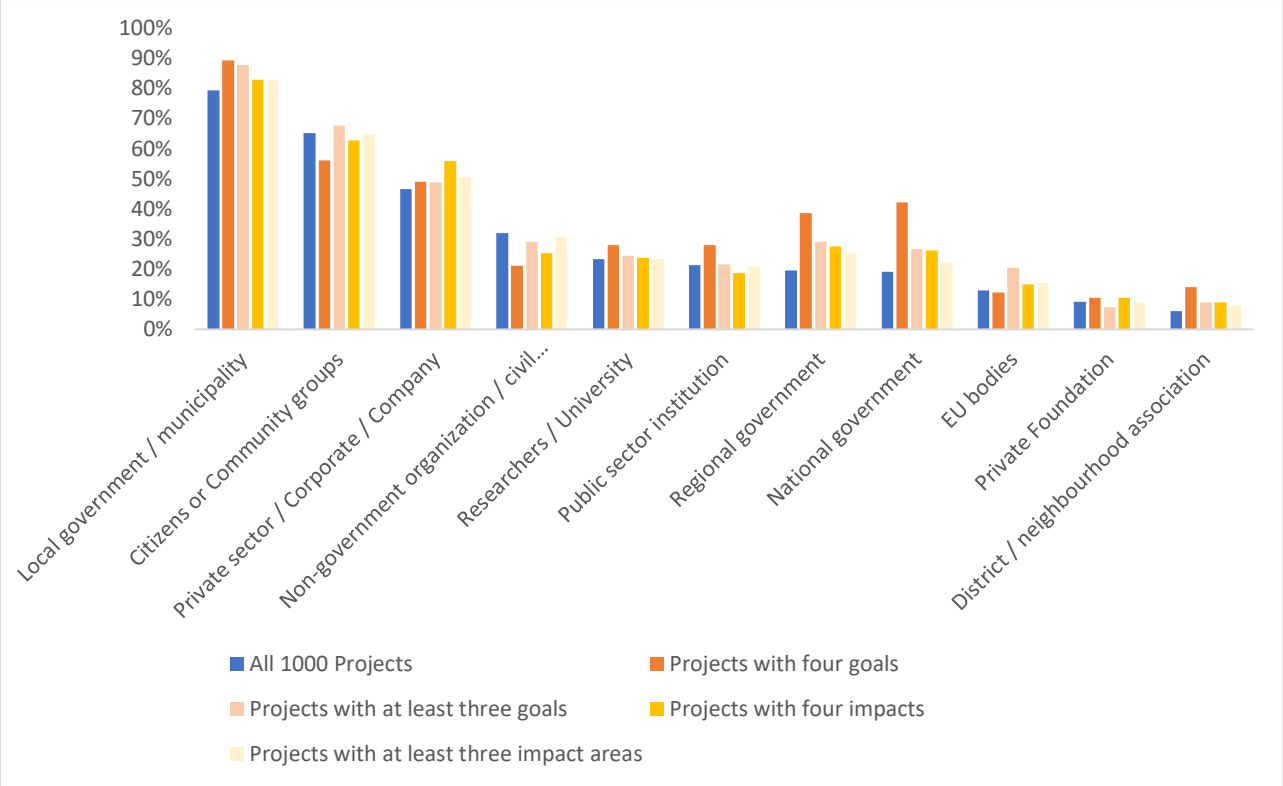


Figure 27: Stakeholder groups included in the UNA projects

Box 15: City Island Park Tour (Utrecht, The Netherlands)

The municipality of Utrecht strives to strengthening the identity of Stadseiland (West Utrecht) as a healthy and climate-proof "city island". The City Island Park Tour consists of a large-scale cycling and walking tour path around the island that includes multiple green and blue infrastructure elements along two canals (Merwede Canal and Amsterdam Rhine Canal), forming a large city park. The tour contains the sights of green riverbanks, recreation possibilities, bridges and green boulevards, aiming to promote a greater environmental quality, mobility and attractiveness of the area. The main goals of the intervention are to improve urban attractiveness, improve quality of life and promoting recreation. Underlying goals of the blue-green infrastructure include: (1) promoting health by stimulating exercise; (2) support urban climate adaptation; (3) supporting mobility by means of improving cycling, walking and running facilities; (4) habitat for species including bats, birds and butterflies; (5) reducing heat stress by improving local climate (reducing local temperature, reducing wind); (6) and improving local air quality.

This government-led project also includes other stakeholders in the planning and implementation process. The municipality of Utrecht worked closely together with Rijkswaterstaat (Ministry of Infrastructure and the Environment) to realize the parks along the Amsterdamse Rijn Canal. The national Ministry of Infrastructure and the Environment was the landowner of the area where green-blue infrastructure was improved and also monitored the plan in line with water management issues. The project was initiated by the municipality of Utrecht, however the following actors were also involved in this intervention: Sport association (TC Domstad: tennis association), housing corporations, the Ministry of Infrastructure and the Environment, local NGOs, community groups (Leidsche Rijn). More specifically in the City Island Park Tour, an urban architecture company (Marco Broekman Urbanism Research Architecture), designers (HKI) and landscape architecture (LINT) were involved in the implementation.

Regional networks that include this project are: Coalition Spatial Adaptation Utrecht, a partnership between Sweco (engineers company), Natuur en Milieufederatie Utrecht (NMU, local NGO) and Hoogheemraadschap Stichtse Rijnlanden (regional water body).

Source: https://una.city/nbs/utrecht/city-island-park-tour

According to the detailed analysis of projects with multiple goals:

- Local, regional and national governments and municipalities were more likely to be involved in projects setting multiple goals.
- Non-governmental organisations, NGOs, and community groups were less likely to be involved in projects setting multiple goals.

Table 77. Stakeholder groups involved in projects addressing multiple goals (variation from the overall sample).

	Local government / municipality	***Citizens or Community groups***	***Private sector / Corporate / Company***	***Non-government organisation / civil society***	***Researchers / University***	***Public sector institution***	***Regional government***	***National government***	***EU bodies***	***Private Foundation***	***District / neighbourhood***
Climate Change, Biodiversity, Health and Economy	0.10	-0.09	0.03	-0.11	0.05	0.07	0.19	0.23	-0.01	0.01	0.08
Climate Change, Biodiversity, Health, Economy AND Social Goals	0.16	-0.05	-0.02	-0.08	0.06	0.07	0.18	0.25	-0.02	0.02	0.12
Projects addressing at least three goals	0.08	0.03	0.02	-0.03	0.01	0.00	0.10	0.08	0.07	-0.02	0.03
• Climate Change, Biodiversity And Health	0.10	0.01	0.03	-0.04	0.03	0.04	0.13	0.11	0.06	-0.02	0.03
• Climate Change, Biodiversity and Economy	0.10	-0.10	0.03	-0.10	0.07	0.06	0.16	0.21	0.02	0.00	0.06
• Biodiversity, Health and Economy	0.08	0.02	-0.05	0.00	0.01	0.04	0.16	0.14	0.02	0.04	0.07
• Climate Change, Health and Economy	0.08	-0.06	0.09	-0.13	0.00	-0.02	0.10	0.14	0.05	-0.03	0.05

According to the detailed analysis of projects with multiple impacts:

- Local, national and regional governments were more often involved in projects that deliver multiple impacts – but to a lesser extent (compared to those projects that et goals in multiple areas).
- Private companies were involved less frequently in projects that set multiple goals, however, they perform above the average in terms of delivering projects with multiple impacts.
- The involvement of citizen groups was more prone in projects that delivered biodiversity, health and economic impacts.
- The involvement of private companies were more likely when they delivered impacts related to climate change.

Table 78. Stakeholder groups involved in projects delivering multiple impacts (variation from the overall sample).

	Local government / municipality	Citizens or Community groups	Private sector / Corporate / Company	Non-government organisation / civil society	Researchers / University	Public sector institution (e.g. school or hospital)	Regional government	National government	EU bodies	Private Foundation	District / neighbourhood association
Climate Change, Biodiversity, Health and Economy	0.04	-0.03	0.09	-0.07	0.01	-0.03	0.08	0.07	0.02	0.01	0.03
Climate Change, Biodiversity, Health, Economy AND Social impacts	0.06	0.00	0.12	-0.08	0.01	-0.03	0.08	0.07	0.00	0.01	0.04
Projects delivering at least three impact categories	0.04	-0.02	0.10	-0.02	0.00	0.01	0.07	0.05	0.03	0.00	0.00
○ Climate Change, Biodiversity And Health	0.02	-0.02	0.05	-0.07	0.02	-0.03	0.07	0.08	0.04	0.02	0.03
○ Climate Change, Biodiversity and Economy	0.03	0.03	-0.01	0.00	-0.01	-0.02	0.06	0.03	-0.02	0.01	0.05
○ Biodiversity, Health and Economy	0.05	-0.06	0.12	-0.09	0.01	-0.05	0.08	0.06	0.04	-0.01	0.01
○ Climate Change, Health and Economy	0.03	0.00	0.04	-0.01	0.00	0.00	0.06	0.03	0.02	0.00	0.02

Table 79.Variation of the stakeholder processes involved in projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	EU bodies	National government	Regional government	Local government /	Public sector institution	Non-government organizatio	Business association	Private sector / Corporate /	Private Foundation	Researcher s / University	Citizens or Community groups	District / neighbourh ood
Climate Change, Biodiversity, Health and Economy	-0,01	0,29	0,26	0,09	0,06	-0,08	0,08	0,17	0,06	0,01	-0,05	0,09
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,00	0,33	0,33	0,16	0,05	-0,02	0,14	0,19	0,08	0,03	0,09	0,16
Projects delivering at least three goals and impacts categories	0,07	0,08	0,13	0,09	0,01	-0,01	0,02	0,04	0,01	0,04	0,04	0,04
o Climate Change, Biodiversity And Health	0,06	0,10	0,16	0,10	0,06	0,00	0,01	0,05	0,01	0,04	0,04	0,00
o Climate Change, Biodiversity and Economy	0,02	0,27	0,22	0,08	0,07	-0,06	0,06	0,15	0,04	0,05	-0,06	0,09
o Biodiversity, Health and Economy	0,00	0,14	0,17	0,08	0,00	0,04	0,05	0,01	0,08	0,01	0,07	0,10
o Climate Change, Health and Economy	0,06	0,20	0,18	0,08	-0,04	-0,16	0,07	0,18	-0,01	0,00	-0,07	0,08

4.6. Business models

Besides policy drivers and financial support, NBS uptake can also be influenced by suitable business models in place that sustain projects over time.

In the UNA, data was collected about the type of business models currently supporting NBS implementation, as well as information into the types of stakeholders involved in the process. NBS projects were categorized into a set of eight business models, defined as follows in Table 66.

Table 80. Business Models of NBS, as defined by Toxopeus (2019) [3]

Business Model	Concept
Risk-reduction	Upfront investments into NBS are made to lower future costs from extreme weather events such as droughts, storms and floods.
Green densification	Integrates NBS into urban real estate development. The costs of creating and maintaining these NBS become an embedded part of a larger business case of 'sustainable urban living', captured through real estate value and economic growth.
Local stewardship	Local NBS plots and trees are valued by citizens and businesses who are willing to protect and support nature in their neighbourhood based on the direct value and sense of identity and meaning that they derive from it.
Green health	The therapeutic, health and wellbeing value of urban NBS is recognized and used as a driver to finance urban NBS.
Urban offsetting	A 'no net loss' approach incentivizes or requires offset investments into urban NBS that are lost because of real estate and Infrastructure development within the city.
Vacant space	The government steps back and provides space for local initiatives and (social) entrepreneurship in (sometimes temporarily) unused urban public space.
Green education	Urban NBS are set up and managed to support environmental education and allow young, urban citizens to engage with food and nature.
Green heritage	Builds on cultural values and a sense of identity to sustain and develop urban NBS. The green spaces that support cultural heritage can lead to different types of value creation (tourism, education, cultural healing).

Across the 1000 European projects, the most commonly encountered business model is green densification in half of the projects (50%). The urban offsetting model and risk reduction model were also found often (23% for both models), and the least popular model seems to be the green health model (7%).

As for the actors that support these business models, the most commonly found are public actors such as municipalities (773 NBS). Other actors include citizens or local community groups (365 NBS), private non-for-profit actors (285 NBS), and private for-profit actors (173 NBS).

Table 81. Business models driving NBS implementation.

Business models	Number of projects
Green densification model	496
Urban offsetting model (biodiversity or water)	230

[3] Source: Toxopeus, H.S. (2019) Taking Action for Urban Nature: Business Model Catalogue, NATURVATION Guide

Risk reduction model	225
Local stewardship model	176
Vacant space model	159
Green education model	158
Green heritage model	108
Green health model	68

Projects can be driven by more than one business model. The average number of business models for the 1000 NBS projects is 1.72, while the average number of business models for projects that aimed to address multiple goals is higher: 1.89 for projects that aimed to tackle four goals, and 1.80 for the projects that aimed to address at least three of the studied goals.

Looking at the average number of business models of the projects that delivered impacts in these areas, the numbers are slightly lower with 1.69 for projects that reported impacts in four impact categories, and 1.61 in projects with at least three impact categories.

Table 82. Average number of business models used in projects with multiple goals and multiple impacts.

	Sustainability goals		Reported impacts	
	Average number of business models	Number of projects in the sample	Average number of business models	Number of projects in the sample
Climate Change, Biodiversity, Health and Economy	1,89	57	1,69	134
Projects addressing at least three goals	1,80	254	1,61	464

When comparing the number of projects that aimed to address four or at least three goals with the total sample, half of the business models (green densification, urban offsetting, risk reduction, green heritage) are more commonly found in these projects than in the total sample. Also, projects tend to report multiple impacts more often when driven by green densification, urban offsetting, risk reduction and green heritage models, than in the overall sample.

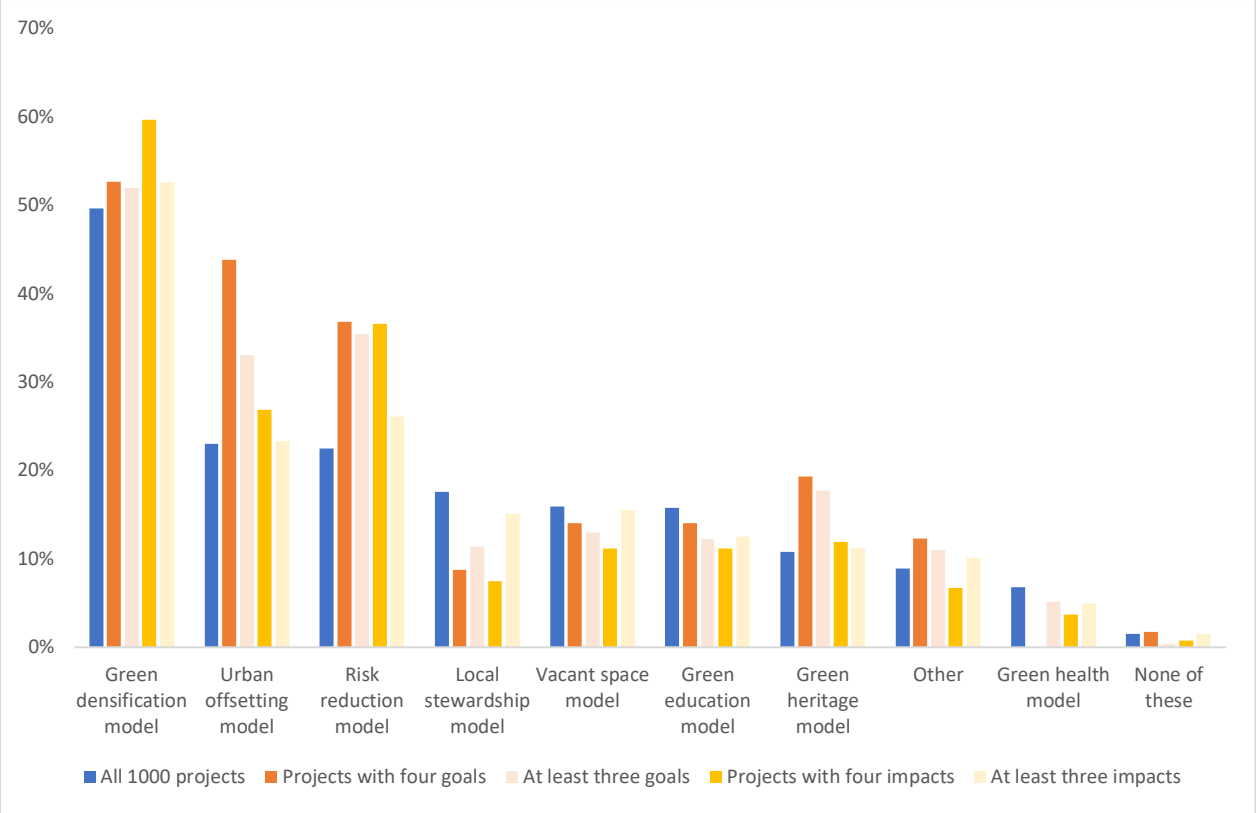


Figure 28. Comparison of business models of all European projects and projects with multiple goals and impacts.

Public actors driving projects' business models are more likely to address multiple goals and report multiple impacts than any of the other business models actors.

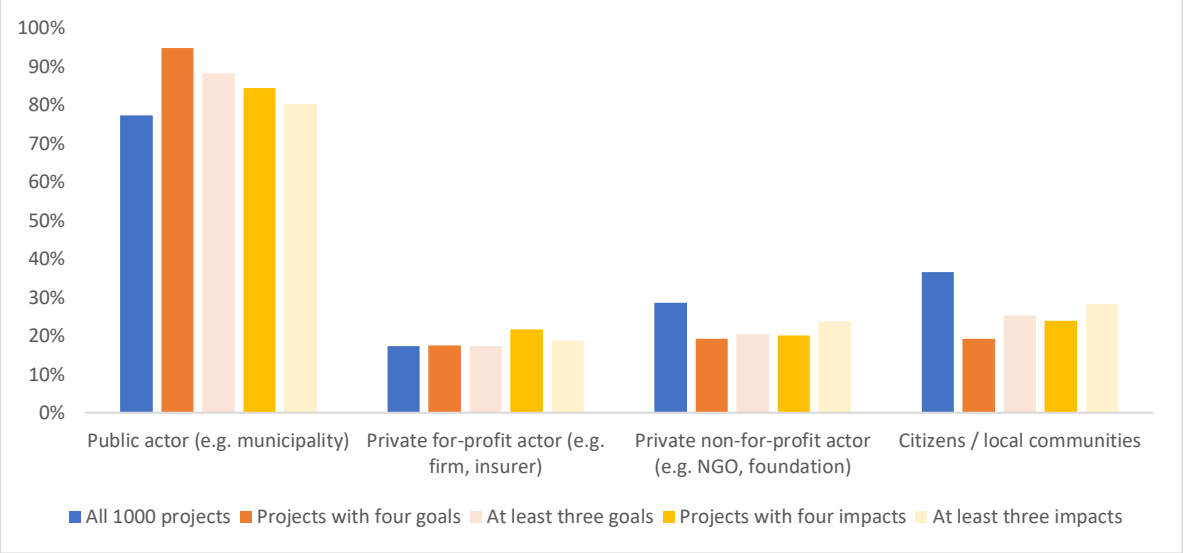


Figure 29. Comparison of the actors involved in the business models of all European projects and projects with multiple goals and impacts.

Findings about projects setting multiple goals:

- Projects that aimed to address four of the studied goals, are more likely to be influenced by urban offsetting and risk reduction models, and are less likely to involve the local stewardship model or the green health model. Projects which

aimed to address at least three goals also seem to be more likely to be driven by green heritage models.

- Risk reduction model are more often included in projects addressing multiple goals, although it seems less frequently to occur when climate change is not a goal of the project.
- Urban offsetting seems likely to be included in projects addressing multiple goals across all goal combinations.
- The green heritage model overall has a positive likelihood of being involved in projects that address multiple goals, however it particularly stands out in projects that involve the simultaneous goals of biodiversity, health and economy.
- The local stewardship model seems to be the least commonly found business model in projects that aim to tackle multiple sustainability goals.
- Business models driven by public actors seem to be more influential for project implementation that aim to address multiple goals. In contrast, business models led by citizens or community groups do not seem likely influence these projects.

Table 83. Business models used in projects addressing multiple goals - variation from the overall sample.

	Risk reduction model	**Green densification model**	**Local stewardship model**	**Green health model**	**Urban offsetting model (biodiversity or water)**	**Vacant space model**	**Green education model**	**Green heritage model**
Climate Change, Biodiversity, Health and Economy	0,14	0,03	-0,09	-0,07	0,21	-0,02	-0,02	0,08
Climate Change, Biodiversity, Health, Economy and Social Goals	0,11	-0,01	-0,06	-0,07	0,28	0,00	0,02	0,14
Projects addressing at least three goals	0,13	0,02	-0,06	-0,02	0,10	-0,03	-0,04	0,07
o Climate Change, Biodiversity And Health	0,19	-0,04	-0,08	-0,02	0,17	-0,02	-0,06	0,04
o Climate Change, Biodiversity and Economy	0,19	0,01	-0,10	-0,05	0,23	-0,04	0,00	0,08
o Biodiversity, Health and Economy	-0,01	0,00	0,00	-0,04	0,10	0,01	0,05	0,15
o Climate Change, Health and Economy	0,16	0,15	-0,11	-0,05	0,09	-0,06	-0,07	0,04

Table 84. Actors involved in the business models used in projects addressing multiple goals - variation from the overall sample.

	Public actor (e.g. municipality)	**Private for-profit actor**	**Private non-for-profit actor**	**Citizens / local communities**
Climate Change, Biodiversity, Health and Economy	0,17	0,00	-0,09	-0,17
Climate Change, Biodiversity, Health, Economy and Social Goals	0,16	-0,04	-0,04	-0,14
Projects addressing at least three goals	0,11	0,00	-0,08	-0,11
o Climate Change, Biodiversity And Health	0,13	-0,01	-0,10	-0,15
o Climate Change, Biodiversity and Economy	0,17	0,00	-0,07	-0,15

o Biodiversity, Health and Economy	0,12	-0,05	-0,02	-0,09
o Climate Change, Health and Economy	0,14	0,07	-0,13	-0,15

Findings about projects delivering multiple impacts:

- Projects that reported impacts across four or at least three of the impact categories under study, are more often influenced by a risk reduction and green densification models. These projects are also less likely to be driven by the local stewardship model, green education, vacant space model or the green health model.
- The risk reduction model seems to likely take place in projects that report impacts across multiple categories in all the studied combinations, with the exception of projects not involving climate action.
- Although projects with green densification business models were less probable to set multiple goals, they performed above the average in multiple impact delivery. Green densification seems to be a model likely to take place in projects that report impacts across multiple categories in all the studied combinations, and particular significant for the combination “climate change, health and economy”.
- Local stewardship models seems less likely to drive projects that report impacts across multiple impact categories, especially in the case of projects that focus on climate adaptation.
- Business models driven by public and private for-profit actors seem likely to be involved in projects that report multiple impacts. In contrast, business models led by citizens or community groups do not seem likely to take place in these projects.

Table 85. Business models used in projects delivering multiple impacts - variation from the overall sample

	Risk reduction model	**Green densification model**	**Local stewardship model**	**Green health model**	**Urban offsetting model (biodiversity or water)**	**Vacant space model**	**Green education model**	**Green heritage model**
Climate Change, Biodiversity, Health and Economy	0,14	0,10	-0,10	-0,03	0,04	-0,05	-0,05	0,01
Climate Change, Biodiversity, Health, Economy and Social	0,13	0,11	-0,09	-0,03	0,03	-0,03	-0,04	0,03
Projects delivering at least three impact categories	0,04	0,03	-0,03	-0,02	0,00	0,00	-0,03	0,00
o Climate Change, Biodiversity And Health	0,13	0,05	-0,08	-0,02	0,05	-0,06	-0,06	0,01
o Climate Change, Biodiversity and Economy	0,15	0,05	-0,09	-0,03	0,04	-0,05	-0,04	0,00
o Biodiversity, Health and Economy	-0,02	0,05	0,01	-0,01	-0,03	0,03	0,00	0,02
o Climate Change, Health and Economy	0,11	0,11	-0,10	-0,03	0,01	-0,02	-0,06	0,00

Table 86. Actors involved in the business models used in projects delivering multiple impacts - variation from the overall sample.

	Public actor (e.g. municipality)	Private for-profit actor	Private non-for-profit actor	Citizens / local communities
Climate Change, Biodiversity, Health and Economy	0,07	0,04	-0,08	-0,13
Climate Change, Biodiversity, Health, Economy and Social	0,05	0,05	-0,08	-0,12
Projects delivering at least three impact categories	0,03	0,01	-0,05	-0,08
o Climate Change, Biodiversity And Health	0,06	0,02	-0,06	-0,12
o Climate Change, Biodiversity and Economy	0,06	0,04	-0,06	-0,13
o Biodiversity, Health and Economy	0,01	0,00	-0,04	-0,03
o Climate Change, Health and Economy	0,08	0,07	-0,11	-0,15

Table 87.Business models used in projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	Risk reduction model	Green densification model	Local stewardship model	Green health model	Urban offsetting model (biodiversity or water)	Vacant space model	Green education model	Green heritag model
Climate Change, Biodiversity, Health and Economy	0,23	0,02	-0,15	-0,07	0,22	-0,10	-0,07	0,0
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,21	-0,02	-0,13	-0,07	0,38	-0,12	-0,07	0,1
Projects delivering at least three goals and impacts categories	0,16	0,01	-0,07	-0,02	0,11	-0,05	-0,04	0,0
o Climate Change, Biodiversity And Health	0,28	-0,05	-0,11	-0,03	0,19	-0,08	-0,07	0,0
o Climate Change, Biodiversity and Economy	0,24	0,02	-0,12	-0,04	0,28	-0,11	-0,06	0,0
o Biodiversity, Health and Economy	0,01	-0,05	0,01	-0,02	0,07	-0,06	0,04	0,1
o Climate Change, Health and Economy	0,18	0,19	-0,16	-0,05	0,10	-0,05	-0,10	-0,0

Table 88. Actors involved in the business models used in projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	Public actor (e.g. municipality)	Private for-profit actor (e.g. firm, insurer)	Private non-for-profit actor (e.g. NGO, foundation)	Citizens / local communities
Climate Change, Biodiversity, Health and Economy	0,20	0,04	-0,07	-0,18
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,18	0,00	-0,02	-0,19

Projects delivering at least three goals and impacts categories	0,11	-0,03	-0,07	-0,12
o Climate Change, Biodiversity And Health	0,13	-0,04	-0,08	-0,14
o Climate Change, Biodiversity and Economy	0,18	0,03	-0,03	-0,16
o Biodiversity, Health and Economy	0,10	-0,06	-0,01	-0,09
o Climate Change, Health and Economy	0,16	0,08	-0,14	-0,19

5. Q5: What can be revealed about the drivers behind NBS implementation?

This section will provide an overview of those potential drivers for NBS projects with multiple goals and/or impacts. We will examine:

- Whether the projects resulted from or linked to EU, national, local policies
- Whether the projects were likely to be driven by voluntary or mandatory initiatives
- What other types of actions (e.g. research activities, international co-operations etc) can support the implementation of projects with multiple goals and impacts local policies
- Whether the projects have monitoring and evaluation activities.

5.1. Policy drivers

The UNA questionnaire collected data on policy drivers in order to examine whether the NBS intervention was developed as a result/in response to, or was influenced by/based on a certain international (EU), national or regional/local regulation, strategy, plan or programme.

In total, the UNA identifies such policy drivers in the case of 73% of all the European projects (726). Most commonly, projects could be linked to local level policy mechanisms (59% of the projects).

Table 89. Intervention is driven/influenced by policies

Policy Drivers	Number of projects
NBS intervention implemented in response to an EU Directive/Strategy	232
NBS intervention implemented in response to a national regulations/strategy/plan	278
NBS intervention implemented in response to a local regulation/strategy/plan	589

Our analysis suggests that policy drivers could commonly be found in projects addressing four or at least three of the studied goals. National and local policies were also more widely identified for projects delivering multiple benefits for climate adaptation, biodiversity, health and economy.

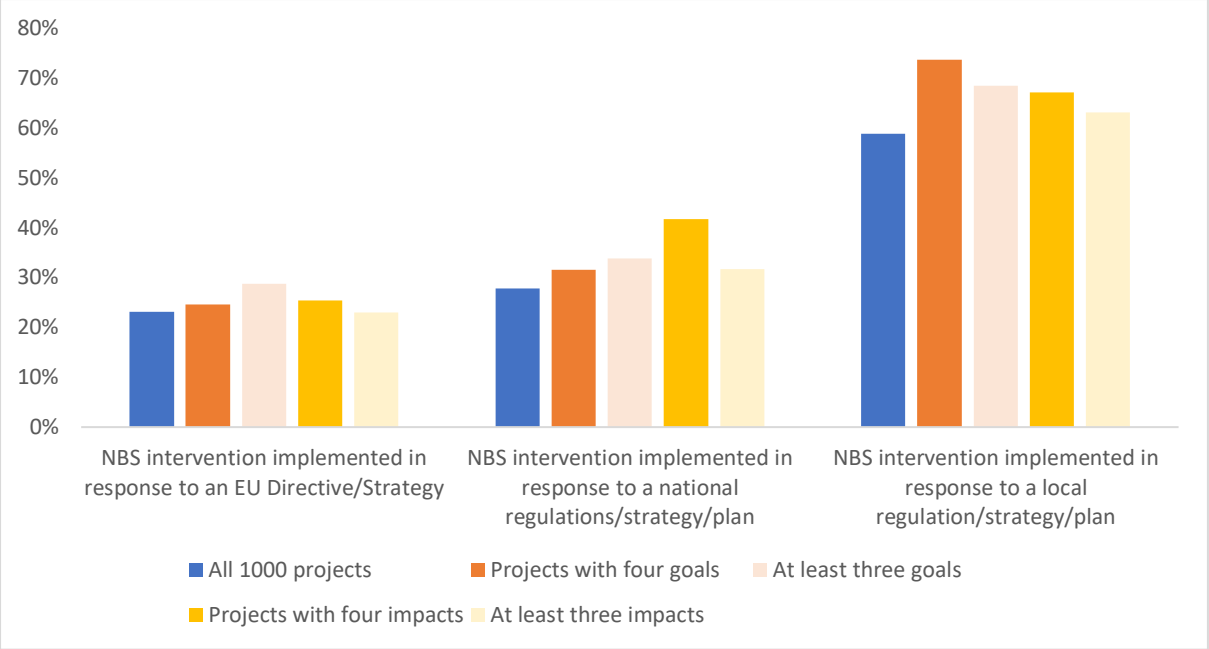


Figure 30. Policy drivers with specification of share of targeted goals and reported impacts.

Box 16: City Park Urban project at Plaine Achille (Saint-Etienne, France)

The Saint-Etienne Public Development Agency (EPASE) and the town hall of Saint-Etienne have set up an ambitious eco-neighborhood project to make the center area of the city attractive and dynamic. The neighborhood was redeveloped with connected green spaces, in which13 hectares of public space were thus renovated and re-vegetated (e.g. cement removed and replaced by stabilized and fertile soil). The goals of the intervention were focused on improving availability of nature in the urban environment, stimulating the district for future inhabitants and companies, improving biodiversity, the living environment and the landscape through enhanced natural heritage. The government-led project was financed by EPASE in a partnership between the state, the city of Saint Etienne, the General Council of the Loire and the Rhône-Alpes region. Universities and real estate developers have also been involved in the eco-district development. One of the drivers of the project was the commitments of the National Plan on Restoring and Valorising nature in the city, specifically with its axes 2 and 3. Axe 2 focuses on “developing natural spaces in quality and quantity”, and the following commitments “Developing natural spaces of proximity” (commitment 7) and “promoting ecological management of nature in the city” (commitment 8). Axe 3 focuses on “promoting a culture and shared governance”, and “promoting citizens' participation in projects of urban nature spaces" (commitment 16). Additionally, the national plan “Nature in the City” plan launched in 2010 is also a driver of this project through its commitment to "restore nature in the city and its multiple functions".

Source: https://una.city/nbs/saint-etienne/city-park-urban-project-plaine-achille

Findings about projects addressing multiple goals:

- Local policies seem to have the strongest influence on projects setting multiple goals. This influence seems to be more prevalent when projects set a climate change adaptation goal.
- When implemented in response/in line with national policies, NBS projects are also more likely to set multiple goals.
- The presence of EU strategies is more probable when projects aimed to address climate change adaptation.

Table 90. Policy drivers of projects addressing multiple goals - variation from the overall sample.

	NBS intervention implemented in response to an EU Directive/Strategy	***NBS intervention implemented in response to a national regulations/strategy/plan***	***NBS intervention implemented in response to a local regulation/strategy/plan***

Climate Change, Biodiversity, Health and Economy	0.02	0.04	0.15
Climate Change, Biodiversity, Health, Economy and Social Goals	-0.01	0.03	0.12
Projects addressing at least three goals	0.06	0.06	0.10
o Climate Change, Biodiversity And Health	0.05	0.07	0.13
o Climate Change, Biodiversity and Economy	0.08	0.06	0.15
o Biodiversity, Health and Economy	0.01	0.04	0.05
o Climate Change, Health and Economy	0.03	0.03	0.15

Findings about projects providing multiple impacts:

- Local policies also appear more frequently in projects delivering multiple impacts, but to a lesser extent (compared to those projects that set goals in multiple areas).
- National policies are more prevalent in projects delivering multiple impacts (especially for climate change adaptation benefits).
- The positive influence of EU policies could only be identified related to climate change adaptation and biodiversity impacts.

Table 91. Policy drivers of projects addressing multiple goals - variation from the overall sample.

	NBS intervention implemented in response to an EU Directive/Strategy	***NBS intervention implemented in response to a national regulations/strategy/ plan***	***NBS intervention implemented in response to a local regulation/strategy/ plan***
Climate Change, Biodiversity, Health and Economy	0.02	0.14	0.08
Climate Change, Biodiversity, Health, Economy and Social	-0.01	0.13	0.09
Projects delivering at least three impact categories	0.00	0.04	0.04
o Climate Change, Biodiversity And Health	0.05	0.09	0.03
o Climate Change, Biodiversity and Economy	0.04	0.12	0.10
o Biodiversity, Health and Economy	-0.05	0.05	0.03
o Climate Change, Health and Economy	0.00	0.08	0.12

Table 92. Policy drivers of projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	NBS intervention implemented in response to an EU Directive/Strategy	***NBS intervention implemented in response to a national regulations/strategy/plan***	***NBS intervention implemented in response to a local regulation/strategy/plan***
Climate Change, Biodiversity, Health and Economy	-0,05	0,15	0,17
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	-0,10	0,11	0,11

Projects delivering at least three goals and impacts categories	0,04	0,09	0,13
o Climate Change, Biodiversity And Health	0,06	0,12	0,12
o Climate Change, Biodiversity and Economy	0,05	0,16	0,18
o Biodiversity, Health and Economy	-0,09	0,06	0,12
o Climate Change, Health and Economy	0,00	0,13	0,18

5.2. Standardization mechanisms

The UNA questionnaire assessed whether the identified interventions were implemented to ensure policy, regulatory compliance or if it was driven by voluntary sustainability standards. Among the 1000 European projects, 36% aimed to ensure compliance with a policy or regulation. An additional 36% of the projects followed different sustainability standards.

Our analysis suggests that projects that set multiple goals, and to a lesser extent, delivered multiple impacts, were somewhat more likely to respond to the requirements of a regulation or a policy. At the same time, projects aiming to address multiple goals were slightly less likely to be linked to voluntary sustainability standards.

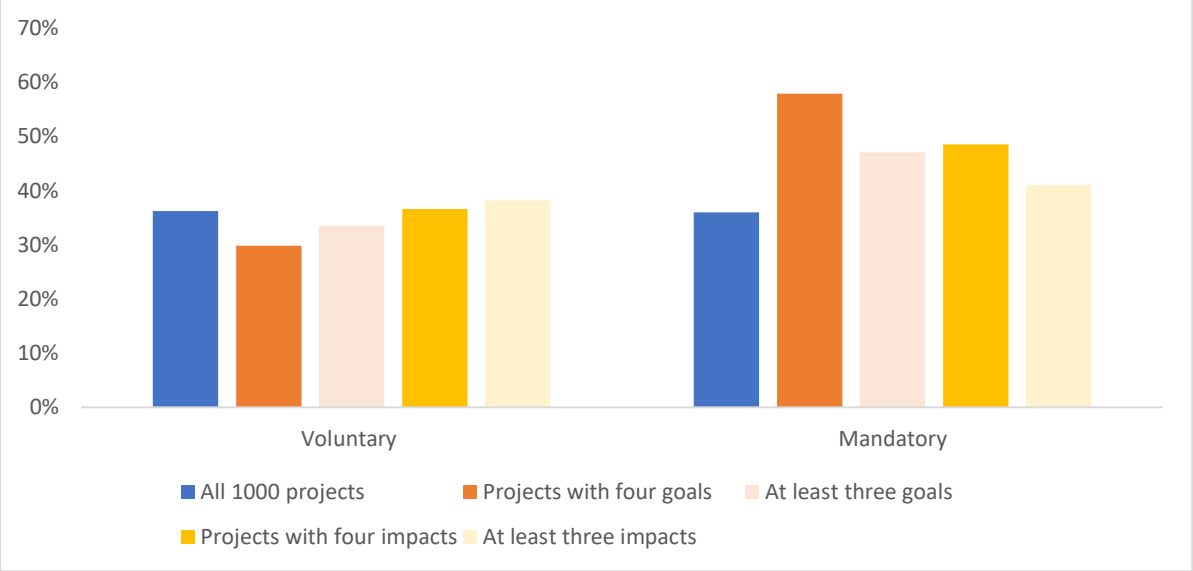


Figure 31. Type of intervention, with specification of share of targeted goals and reported impacts.

“Mandatory” interventions can be linked to spatial planning guidance, environmental regulations, spatial planning laws or other type of regulations related to buildings or energy.

Table 93. Intervention implemented to secure regulatory or policy compliance.

Intervention is mandatory, as a result of:	Number of projects
Spatial planning guidance	210
Environmental regulation	206

Spatial planning law	56
Other	25
Building regulation	20
Energy regulation	10

In the case of projects aiming to address multiple goals or deliver impacts in multiple areas, all the above-listed policy or regulatory mechanisms were more probable to appear. However, compared to multiple impact delivery, the role of these regulations and policies seems to be more relevant for multiple goal-setting.

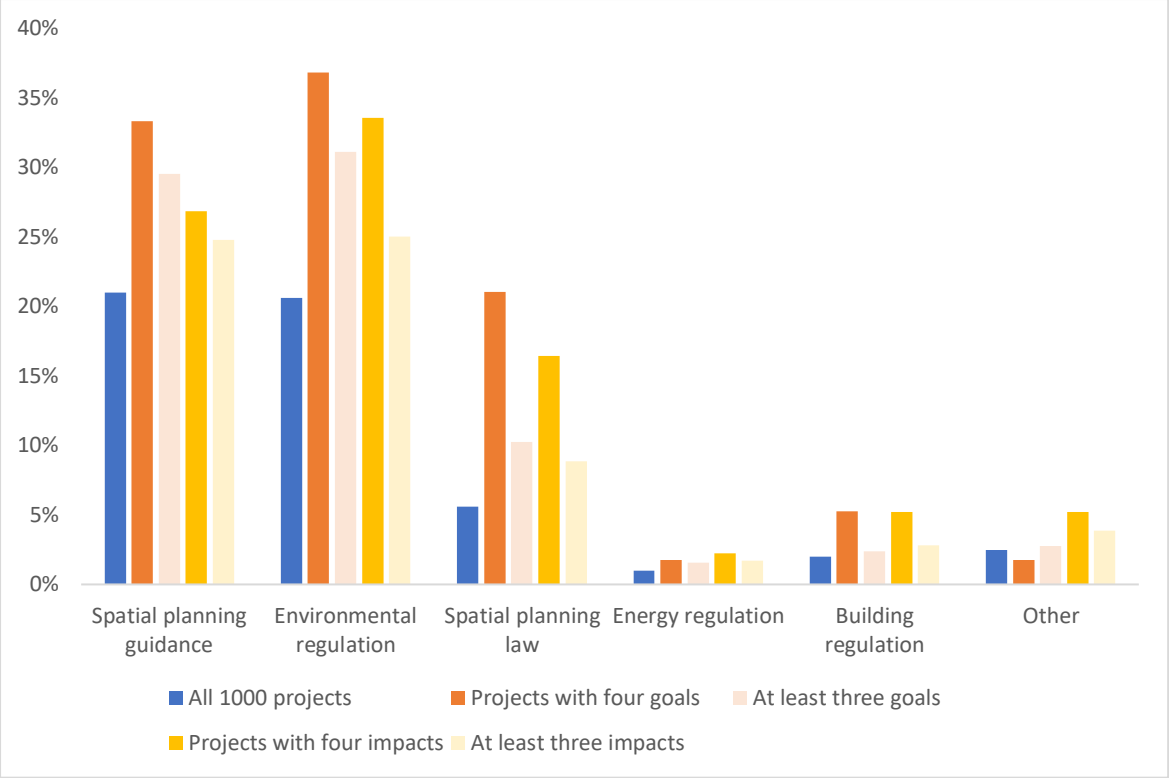


Figure 32. Comparison of projects implemented as a result of regulatory or policy compliance

With regards to voluntary sustainability standardisation processes, the database distinguished environmental standards, voluntary planning guidances, corporate social responsibility strategies and building certification schemes.

Table 94. Intervention implemented to secure regulatory or policy compliance.

Intervention is voluntary, as a result of:	Number of projects
Voluntary environmental standards	227
Voluntary planning guidance	173
Corporate social responsibility strategy	39
Voluntary building certification scheme	25

Planning practice guidance and building certification schemes were more prone to influence multiple impact delivery, while environmental standards and corporate social responsibility strategies were less likely. Unlike in case of mandatory interventions,

voluntary sustainability standards were less likely to influence multiple goal setting but seemed to have a bigger effect on projects delivering multiple impacts.

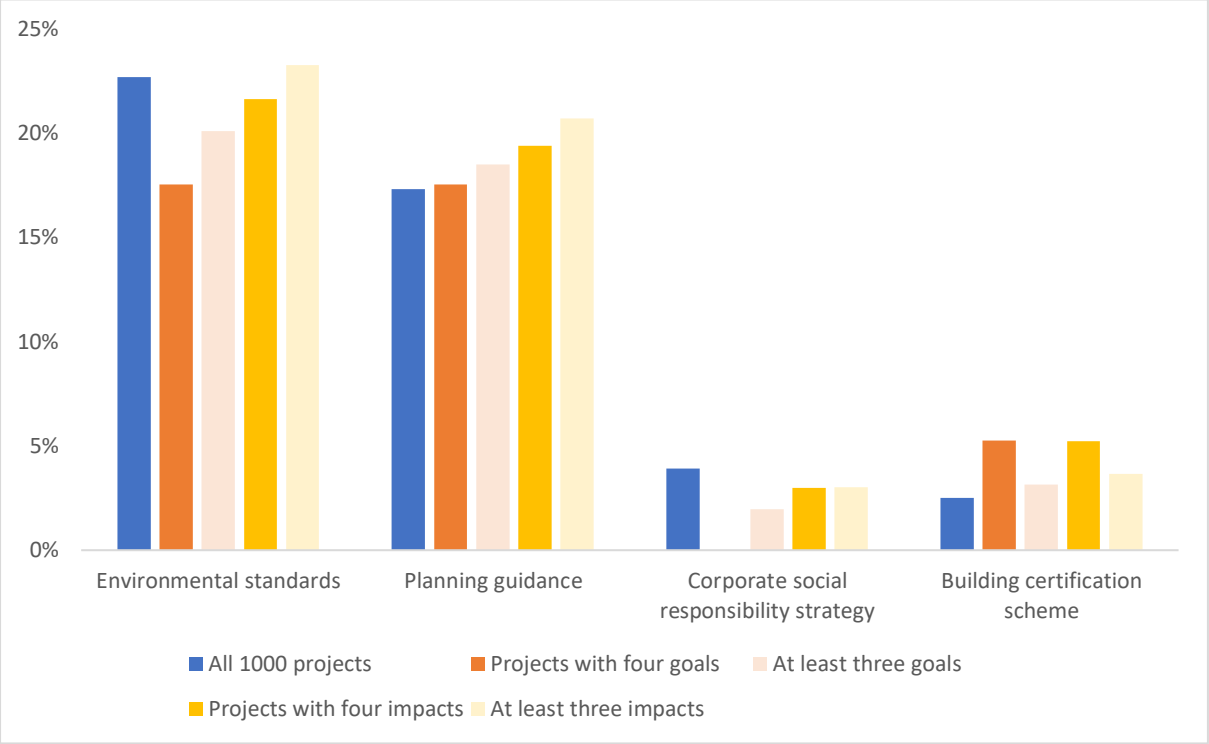


Figure 33. Comparison of projects influenced by voluntary sustainability standards

Box 17: Peri-urban natural park of Collserola (Barcelona, Spain)

The peri-urban natural park of Collserola is a forested area of about 8,000 ha in the hilly Northern fringes of Barcelona. Collserola has been managed under a special protection plan and forms part of the European FEDENATUR network that aims at protecting fragile peri-urban ecosystem for both their social and ecological functions. The park is jointly managed by a consortium including the Catalan government (Generalitat de Catalunya), the Barcelona Provincial Council (Diputació de Barcelona), the Metropolitan Area of Barcelona (AMB) as well as all adjacent municipalities.

The ultimate goal of the NBS intervention is to promote the respectful and sustainable use of this area, while preserving its natural values. Other goals of the project include enhancing sustainable urbanisation, restoring ecosystems and their functions, improve risk management and climate change resilience, and lastly, to preserve the biodiversity of this metropolitan green lung and promote services that are aimed at leisure for citizens.

The initiative is government-led and the park consortium is in charge of managing and preserving the park. The consortium of the *Serra de Collserola* Natural Park is a public entity with an organizational structure whose purpose is the management and development of the Special Plan for the Ordering and Protection of the Natural Environment of the *Parc de Collserola*. It is made up of the Metropolitan Area of Barcelona and the nine municipalities with territory in the park area (El Papiol, Molins de Rei, Sant Feliu de Llobregat, Sant Just Desvern, Esplugues de Llobregat, Barcelona, Montcada i Reixac, Cerdanyola Del Vallès and Sant Cugat del Vallès).

The NBS intervention was implemented in response to a local plan ("Special Plan for the Protection of the Natural Environment and Landscape of the Serra de Collserola Natural Park (PEPNat)"), and is considered to be mandatory by both spatial planning law ("Metropolitan Territorial Plan of Barcelona") and an biodiversity and habitat regulation ("Natura 2000 framework" and "Areas of Natural Interest Plan - PEIN). The territory of the peri-urban natural park of Collserola has been historically managed since 1987 within the framework of the PEPNat and, as of 2010, it has been consolidated with the Declaration of the Natural Park ("*Declaració de Parc Natural*").

Source: https://una.city/nbs/barcelona/peri-urban-natural-park-collserola

Findings about projects setting multiple goals:

- Projects implemented in compliance with spatial planning or environmental regulations were significantly more probable to introduce goals for all four or at least three of the studied challenges.
- Energy and building regulations were less likely to influence multiple goal-setting in projects, but the relatively small sample size should be considered when evaluating this result.
- While the assessed mechanisms positively influenced goal setting for all studied sustainability challenges, climate change adaptation-related objectives were more likely to be set in the presence of spatial planning guidance, law or environmental regulations.
- With regards to voluntary sustainability standards, building certifications and planning guidance seem to have a weak positive influence on multiple goal-setting efforts.
- Environmental standards and CSR strategies do not seem to influence multiple goal-setting positively.

Table 95. Type of mandatory projects addressing multiple goals - variation from the overall sample.

	Spatial planning guidance	Spatial planning law	Environmental regulation	Energy regulation	Building regulation	Other
Climate Change, Biodiversity, Health and Economy	0,12	0,15	0,16	0,01	0,03	-0,01
Climate Change, Biodiversity, Health, Economy and Social Goals	0,10	0,14	0,17	-0,01	0,00	0,00
Projects addressing at least three goals	0,09	0,05	0,11	0,01	0,00	0,00
o Climate Change, Biodiversity And Health	0,10	0,06	0,14	0,01	0,01	-0,01
o Climate Change, Biodiversity and Economy	0,10	0,13	0,15	0,01	0,03	0,01
o Biodiversity, Health and Economy	0,04	0,09	0,12	0,00	0,01	0,00
o Climate Change, Health and Economy	0,16	0,10	0,10	0,01	0,03	0,00

Table 96. Type of voluntary projects addressing multiple goals - variation from the overall sample.

	Building certification scheme	Planning guidance	Environmental standards	Corporate social responsibility strategy	Other
Climate Change, Biodiversity, Health and Economy	0,03	0,00	-0,05	-0,04	-0,11
Climate Change, Biodiversity, Health, Economy and Social Goals	0,04	0,03	-0,03	-0,04	-0,17
Projects addressing at least three goals	0,01	0,01	-0,03	-0,02	-0,09
o Climate Change, Biodiversity And Health	0,01	0,02	-0,06	-0,03	-0,11
o Climate Change, Biodiversity and Economy	0,02	0,03	-0,04	-0,04	-0,12
o Biodiversity, Health and Economy	0,00	-0,03	0,01	-0,02	-0,04
o Climate Change, Health and Economy	0,02	0,02	-0,04	-0,02	-0,12

Findings about projects delivering multiple impacts:

- Regulatory mechanisms positively influence multiple impact delivery, but somewhat less than goal-setting processes.
- The effect of these mechanisms (especially environmental regulation) seems stronger in the case of projects providing benefits for climate change adaptation.
- Similarly to goal-setting, voluntary planning guidance and building certification schemes seem to support multiple impact delivery. It must be noted that the number of projects where building certifications were identified as a potential policy driver is limited.

Table 97. Type of mandatory projects delivering multiple impacts - variation from the overall sample.

	Spatial planning guidance	Spatial planning law	Environmental regulation	Energy regulation	Building regulation	Other
Climate Change, Biodiversity, Health and Economy	0,06	0,11	0,13	0,01	0,03	0,03
Climate Change, Biodiversity, Health, Economy and Social	0,06	0,12	0,09	0,02	0,03	0,04
Projects delivering at least three impact categories	0,04	0,03	0,04	0,01	0,01	0,01
o Climate Change, Biodiversity And Health	0,05	0,06	0,11	0,01	0,01	0,02
o Climate Change, Biodiversity and Economy	0,05	0,09	0,11	0,01	0,02	0,03
o Biodiversity, Health and Economy	0,02	0,05	0,01	0,01	0,01	0,02
o Climate Change, Health and Economy	0,08	0,08	0,12	0,02	0,04	0,02

Table 98. Type of the voluntary projects delivering multiple impacts - variation from the overall sample.

	Building certification scheme	Planning guidance	Environmental standards	Corporate social responsibility strategy	Other
Climate Change, Biodiversity, Health and Economy	0,03	0,02	-0,01	-0,01	-0,14
Climate Change, Biodiversity, Health, Economy and Social	0,04	0,04	-0,01	0,00	-0,13
Projects delivering at least three impact categories	0,01	0,03	0,01	-0,01	-0,08
o Climate Change, Biodiversity And Health	0,02	-0,01	-0,01	-0,01	-0,10
o Climate Change, Biodiversity and Economy	0,03	0,02	-0,01	0,00	-0,14
o Biodiversity, Health and Economy	0,02	0,06	0,00	-0,01	-0,07
o Climate Change, Health and Economy	0,02	0,03	0,01	-0,01	-0,15

Table 99.Type of mandatory projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	Spatial planning	Spatial planning law	Environmental regulation	Energy regulation	Building regulation	Other
Climate Change, Biodiversity, Health and Economy	0,12	0,25	0,22	0,02	0,07	0,01
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,05	0,25	0,19	-0,01	0,02	0,02
Projects delivering at least three goals and impacts categories	0,10	0,08	0,13	0,01	0,01	0,01
o Climate Change, Biodiversity And Health	0,12	0,11	0,16	0,02	0,02	-0,01
o Climate Change, Biodiversity and Economy	0,07	0,20	0,18	0,02	0,06	0,00

o Biodiversity, Health and Economy	0,04	0,12	0,13	0,00	0,02	0,02
o Climate Change, Health and Economy	0,20	0,18	0,18	0,02	0,04	0,02

Table 100. Type of the voluntary projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	Voluntary building	Voluntary planning guidance	Voluntary environmental	Corporate social responsib	Other
Climate Change, Biodiversity, Health and Economy	0,07	0,04	-0,08	-0,04	-0,16
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,11	0,13	-0,05	-0,04	-0,21
Projects delivering at least three goals and impacts categories	0,00	0,01	-0,01	-0,02	-0,09
o Climate Change, Biodiversity And Health	0,01	0,02	-0,07	-0,03	-0,12
o Climate Change, Biodiversity and Economy	0,05	0,08	-0,02	-0,04	-0,18
o Biodiversity, Health and Economy	0,02	-0,01	0,00	-0,01	-0,04
o Climate Change, Health and Economy	0,02	0,01	-0,02	-0,02	-0,16

5.3. Enablers

This section studies why certain forms of NBS interventions exist in certain cities. The questions under this heading will examine:

- the existence of a shared urban/regional vision/framing/discourse on NBS (such as a specific policy vision, or a strategic document by citizen groups, etc.);
- the existence of learning mechanisms on NBS (know-ledge infrastructure/research activities, monitoring program, participation in trans-local net- works);
- the presence of urban/regional networks and actors involved in nature-related activities that NBS is building upon (e.g. 'suppliers' of NBS, active 'user' groups, cultural organisations, research institutes, NBS related policy net-works); and
- the presence of resources for supporting NBS (public subsidies, private investment programs).

In total, 65% of the 1000 European projects indicated to be linked to an existing public or citizen-led GI/NBS vision/strategy/plan. Public subsidies or private investment programs supported the implementation of over half of the projects (53%). National or transnational networks and research projects were also identified to support more than one-third of all the European NBS projects.

Table 101. Number of enablers identified in connection to the European NBS projects.

Type of enabler	Number of projects

Presence of specific city-level GI/NBS vision/strategy/plan in a more general plan mentioned in connection to the project	652
Presence of city network or regional partnerships focused on NBS	421
Presence of GI/NBS research project	338
Subsidies/investment for GI/NBS in the city mentioned in connection to the project	531

GI/NBS visions, strategies and plans were provided by or included in various types of strategic documents. Most commonly, the projects noted the role of urban redevelopment plans, urban green space strategies, local environmental plans, and plans developed by private organizations or community groups.

Table 102. Type of GI vision/strategies/plans connected to the projects addressing multiple goals - variation from the overall sample.

Relevant strategy or plan	Number of projects
Urban redevelopment plan	188
City specific green space strategy or plan	187
Municipal / city level environmental plan or programme	165
Other (e.g. company strategy or citizen initiative)	165
General municipal plan	115
Biodiversity strategy or plan	103
Water regulation strategy	88
City specific climate change policy or plan	73
City energy strategy	5

Our analysis suggests that all studied enablers were more prevalent in the case of projects setting multiple studied goals simultaneously. To a lesser extent, they were also more likely to support the provision of multiple impacts.

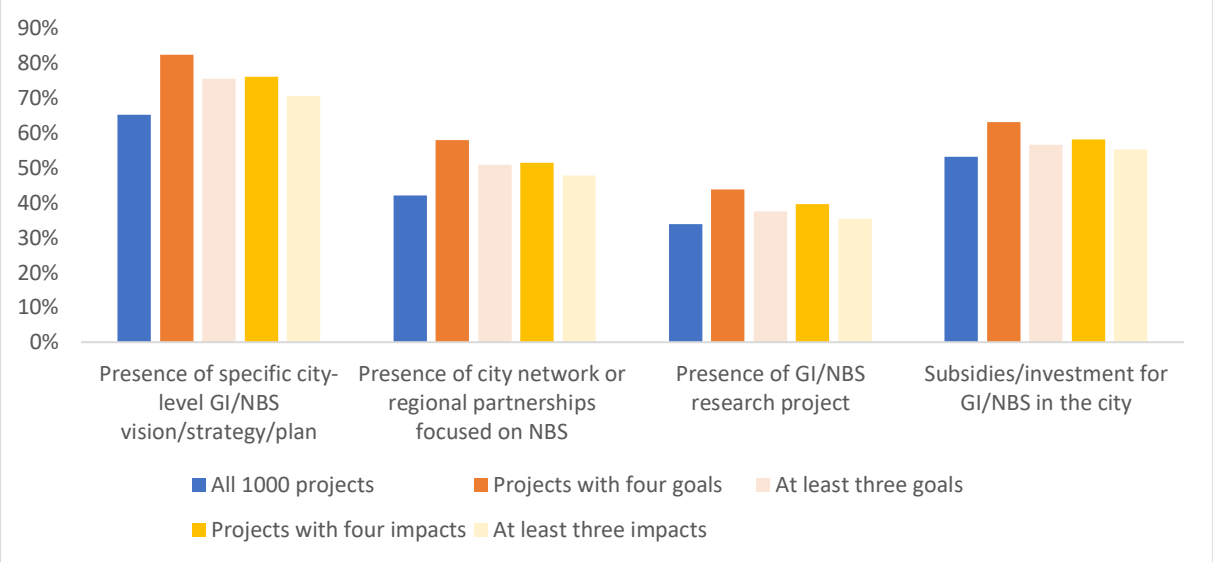


Figure 34. Comparison of projects enablers

Box 18: Seven Lochs Scotland's urban Wildlife Park (Glasgow, United Kingdom)

The Seven Lochs Wetland Park is an ongoing urban park project in Scotland. Once completed, it will be Scotland's largest urban heritage and nature park, comprising nearly 20 km² of area. The park will combine many existing features, including four local nature reserves, parks and lochs. The vision for the Seven Lochs Wetland Park is of a new park of national significance, sustaining and enhancing a high quality, innovative wetland environment that will protect and enhance biodiversity and heritage, promote health and well-being, and contribute to environmental, economic and social regeneration. Specific objectives of the initiative include: (1) to establish a project partnership to guide the development and implementation of the initiative; (2) conserve and enhance biodiversity; (3) raise awareness of the area's biodiversity assets and cultural heritage; (4) encourage access to the area and improver recreational activities; (5) encourage citizen involvement through volunteering, training, social enterprise and local business development

The initiative has a hybrid governance arrangement, that involves a diverse group of actors, such as the Forestry Commission, Scotland, the Glasgow City Council, the Green Network Partnership, and the International Resources and Recycling Institute. Jobs and Business Glasgow, North Lanarkshire Council, Scottish Natural Heritage, the Conservation Volunteers of Scotland were also involved in developing and implementing the activities jointly. The initiative is also supported by city networks and regional partnerships , including the Glasgow and Clyde Valley Green Network Partnership (GCVGNP), the Gartloch Gartcosh Strategic Delivery Partnership and Seven Lochs Partnership, which brings together Glasgow City Council, North Lanarkshire Council, The Conservation Volunteers Scotland, Forestry Commission Scotland, and Scottish Natural Heritage.

Source: https://una.city/nbs/glasgow/seven-lochs-scotlands-urban-wildlife-park

Findings about projects setting multiple goals:

- Among the studied enablers, GI and NBS visions, strategies or plans seem to have the most substantial influence on multiple goal setting – especially when climate change adaptation and biodiversity issues are included in the project.
- Among the different types of strategic initiatives, GI or green space strategies, biodiversity strategies, municipal environmental plans and to a lesser extent, general municipal plans are more frequently identified in projects delivering multiple of the studied goals.
- Transnational networks are suggested to be the second strongest enabler of project implementation with multiple goals, especially when they consider biodiversity, health and economy issues.
- The positive influence of subsidies stands out when the projects consider climate change, biodiversity and economic challenges.

Table 103. Type of enablers of the projects addressing multiple goals - variation from the overall sample.

	Presence of specific city-level GI/NBS vision/strategy/plan	**Presence of specific city-level GI/NBS vision/strategy/plan**	**Presence of city network or regional partnerships focused on NBS**	**Presence of GI/NBS research project**	**Subsidies/investment for GI/NBS in the city**
Climate Change, Biodiversity, Health and Economy	0.17	0.18	0.16	0.10	0.10
Climate Change, Biodiversity, Health, Economy and Social Goals	0.20	0.22	0.13	0.06	0.07

Projects addressing at least three goals	0.11	0.08	0.09	0.04	0.04
o Climate Change, Biodiversity And Health	0.19	0.10	0.08	0.07	0.06
o Climate Change, Biodiversity and Economy	0.17	0.14	0.12	0.12	0.12
o Biodiversity, Health and Economy	0.07	0.05	0.17	0.05	0.05
o Climate Change, Health and Economy	0.10	0.19	0.12	0.02	0.04

Table 104. City-level strategies or plans connected to the projects addressing multiple goals - variation from the overall sample.

	City specific climate change policy or plan	City specific green space strategy or plan	Biodiversity strategy or plan	Water regulation strategy	City energy strategy	Municipal / city level environmental plan or programme	General municipal plan	Urban redevelopment plan	Other
Climate Change, Biodiversity, Health and Economy	0,01	0,09	0,14	0,02	-0,01	0,08	0,04	0,04	0.03
Climate Change, Biodiversity, Health, Economy and Social Goals	-0,01	0,12	0,21	-0,02	-0,01	0,08	0,04	0,06	0.04
Projects addressing at least three goals	0,02	0,03	0,04	0,03	0,00	0,08	0,03	0,03	0.04
o Climate Change, Biodiversity And Health	0,03	0,08	0,06	0,08	0,01	0,10	0,04	0,01	0.04
o Climate Change, Biodiversity and Economy	0,02	0,07	0,11	0,02	-0,01	0,05	0,04	0,04	0.07
o Biodiversity, Health and Economy	-0,01	0,03	0,11	-0,03	-0,01	0,09	0,02	0,01	-0.01
o Climate Change, Health and Economy	0,02	0,04	0,07	0,01	-0,01	0,05	0,05	0,10	0.05

Findings about projects delivering multiple impacts:

- Compared to projects setting multiple goals, enablers were identified somewhat less frequently in projects delivering benefits in four or at least three impact areas. However, they still have a positive influence.
- Among the studied enablers, GI or NBS visions, strategies or plans have the strongest potential to support multiple impact delivery – especially for climate change adaptation and economic development.
- With regards to the different types of strategic initiatives, projects supported by GI or green space strategies and municipal environmental plans have the most substantial potential to deliver multiple impacts. Unlike projects aiming to address multiple goals, the effect of biodiversity strategies and general municipal plans is less emphasized. Moreover, while water management strategies seem not to influence multiple goal-setting, they seem to have the potential to support benefit provision in studied impact areas.

- Projects participating in transnational networks also had an above average potential to deliver multiple impacts.

Table 105. Type of enablers of projects delivering multiple impacts - variation from the overall sample.

	Presence of specific city-level GI/NBS vision/strategy/plan	Presence of specific city-level GI/NBS vision/strategy/plan	Presence of city network or regional partnerships focused on NBS	Presence of GI/NBS research project	Subsidies/ investment for GI/NBS in the city
Climate Change, Biodiversity, Health and Economy	0.13	0.09	0.09	0.06	0.05
Climate Change, Biodiversity, Health, Economy and Social	0.10	0.14	0.09	0.05	0.05
Projects delivering at least three impact categories	0.05	0.05	0.06	0.02	0.02
o Climate Change, Biodiversity And Health	0.06	0.03	0.03	0.04	0.02
o Climate Change, Biodiversity and Economy	0.13	0.08	0.10	0.05	0.07
o Biodiversity, Health and Economy	0.07	0.05	0.10	0.02	0.03
o Climate Change, Health and Economy	0.11	0.14	0.08	0.03	0.04

Table 106. City-level strategies or plans connected to the projects delivering multiple impacts (variation from the overall sample).

	City specific climate change policy or plan	City specific green space strategy or plan	Biodiversity strategy or plan	Water regulation strategy	City energy strategy	Municipal / city level environmental plan or programme	General municipal plan	Urban redevelopment plan	Other
Climate Change, Biodiversity, Health and Economy	0,01	0,10	0,03	0,05	0,00	0,08	0,01	0,00	0,05
Climate Change, Biodiversity, Health, Economy and Social	0,01	0,09	0,04	0,02	0,00	0,08	0,02	0,02	0,05
Projects delivering at least three impact categories	0,03	0,04	0,01	0,02	0,01	0,03	0,00	0,03	0,01
o Climate Change, Biodiversity And Health	0,04	0,06	0,03	0,05	0,01	0,04	0,00	-0,01	0,01
o Climate Change, Biodiversity and Economy	0,02	0,10	0,01	0,07	0,00	0,05	-0,01	-0,01	0,05
o Biodiversity, Health and Economy	0,00	0,03	0,02	-0,01	0,00	0,04	0,01	0,02	0,03
o Climate Change, Health and Economy	0,03	0,09	0,02	0,04	0,00	0,09	0,02	0,06	0,04

Table 107. Type of enablers of the projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	Presence of specific city-level GI/NBS vision/strategy/plan	Presence of specific city-level GI/NBS vision/strategy/plan	Presence of city network or regional partnerships focused on	Presence of GI/NBS research project	Subsidies/investment for GI/NBS in the city
Climate Change, Biodiversity, Health and Economy	0,28	0,19	0,28	0,21	0,17
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,34	0,27	0,32	0,18	0,21

Projects delivering at least three goals and impacts categories	0,15	0,10	0,12	0,07	0,06
o Climate Change, Biodiversity And Health	0,22	0,09	0,10	0,12	0,08
o Climate Change, Biodiversity and Economy	0,29	0,17	0,22	0,20	0,16
o Biodiversity, Health and Economy	0,12	0,09	0,27	0,13	0,11
o Climate Change, Health and Economy	0,18	0,22	0,17	0,04	0,08

Table 108.City-level strategies or plans connected to the projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	City specific climate	City specific green	Biodiversity strategy or plan	Water regulation strategy	City energy strategy	Municipal / city level environme	General municipal plan	Urban redevelop ment plan	Other
Climate Change, Biodiversity, Health and Economy	0,05	0,21	0,11	0,03	-0,01	0,08	0,07	-0,04	0,14
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	0,06	0,25	0,16	-0,04	-0,01	0,05	0,06	-0,01	0,18
Projects delivering at least three goals and impacts categories	0,03	0,07	0,07	0,04	0,01	0,11	0,03	0,02	0,05
o Climate Change, Biodiversity And Health	0,06	0,13	0,07	0,09	0,01	0,12	0,05	-0,03	0,07
o Climate Change, Biodiversity and Economy	0,06	0,20	0,10	0,04	-0,01	0,07	0,04	-0,03	0,17
o Biodiversity, Health and Economy	0,01	0,09	0,10	-0,03	-0,01	0,10	0,04	0,00	0,04
o Climate Change, Health and Economy	0,02	0,09	0,07	0,02	-0,01	0,07	0,04	0,06	0,10

5.4. Monitoring

In this section, we will examine the presence of monitoring systems, the type of evaluation activities and the evaluation methods used for impact assessments in NBS projects with multiple goals and in projects that delivered impacts in the studied areas.

Although tracking implementation outcomes and assessing the impacts of the NBS project is of crucial importance, there is limited evidence for monitoring activities in the 1000 European NBS projects. Only one-third of the projects reported explicitly the introduction of a monitoring system. Similarly, one-third of the projects provided information on the utilized assessment methods. In addition, only 11% of the projects involved citizens in the evaluation of the NBS interventions.

Table 109. Monitoring information identified in connection to the European NBS projects.

	Number of projects
Presence of formal monitoring system	334
Number of projects recording/monitoring impacts	324

Citizens involvement in assessment/evaluation of the NBS intervention	111

The analysis of projects setting multiple studied goals or delivering impacts in multiple studied areas suggests that in comparison to the general European sample, these projects were not more likely to have formal monitoring systems but were more likely to record/monitor their impacts. In addition, they involved citizens in assessment/evaluation activities more frequently.

Figure 35. Monitoring activities of European NBS projects, with specification of share of targeted goals and reported impacts.

With regards to the methods utilized to assess/record impacts, European projects most frequently recorded bio-physical aspects (18%) or used observation techniques (16%).

Table 110. Specification of methods used to evaluate NBS projects impacts.

Methods used to evaluate the impacts of NBS	**Number of projects**
Measurements of biophysical aspects of the NBS	180
Observation (including virtual surveillance methods)	161
Other	118
Focus groups	70
Questionnaire surveys / online surveys	65
Interviews	40
GIS data analysis	25

Projects addressing four or at least three of the studied goals or delivering impacts in these areas were somewhat more likely to measure the biophysical aspects of the NBS and use questionnaires or focus groups to assess project outcomes.

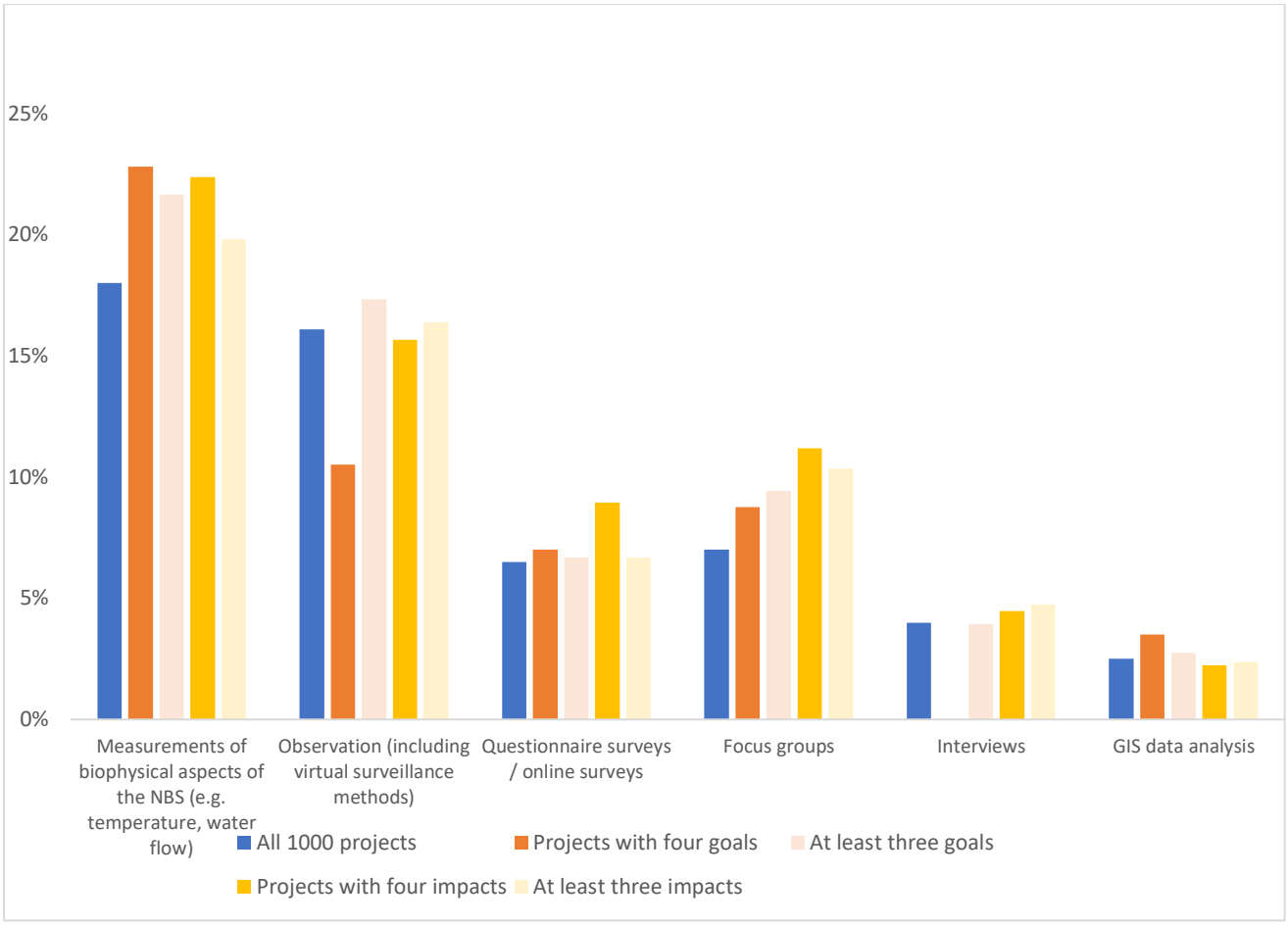


Figure 36. Types of methods used to evaluate NBS projects impacts, with specification of share of targeted goals and reported impacts.

Findings about projects setting with multiple goals:

- Projects which set multiple goals were not more likely to put a formal monitoring system in place to monitor their outcomes. At the same time, they more frequently recorded and assessed their impacts using different quantitative and qualitative methods – especially when the projects had a biodiversity target.
- Citizen involvement in impact assessment and evaluation was much more common, particularly when projects targeted both biodiversity and economic development.
- With regards to evaluation methods, projects with climate and biodiversity goals were more likely to utilise quantitative measurement methods to record their impacts.

Table 111. Type of monitoring activities in the projects addressing multiple goals (variation from the overall sample).

	Presence of formal monitoring system	**Information on recording/monitoring impacts**	**Citizens involvement in assessment/evaluation of the NBS intervention**
Climate Change, Biodiversity, Health and Economy	0.00	0.06	0.27
Climate Change, Biodiversity, Health, Economy and Social Goals	-0.02	0.05	0.36

Projects addressing at least three goals	0.02	0.07	0.32
o Climate Change, Biodiversity And Health	0.02	0.07	0.26
o Climate Change, Biodiversity and Economy	0.02	0.11	0.30
o Biodiversity, Health and Economy	0.03	0.10	0.40
o Climate Change, Health and Economy	-0.02	0.01	0.26

Table 112. Methods used to evaluate the impacts of NBS in the projects addressing multiple goals (variation from the overall sample).

	Interviews	Focus groups	Questionnaire surveys / online surveys	GIS data analysis	Measurements of biophysical aspects of the NBS	Observation	Other
Climate Change, Biodiversity, Health and Economy	-0,04	0,02	0,01	0,01	0,05	-0,06	0,09
Climate Change, Biodiversity, Health, Economy and Social Goals	-0,04	0,04	0,00	0,02	0,02	-0,05	0,13
Projects addressing at least three goals	0,00	0,02	0,00	0,00	0,04	0,01	0,05
o Climate Change, Biodiversity And Health	-0,02	0,00	0,00	0,01	0,10	-0,01	0,06
o Climate Change, Biodiversity and Economy	-0,04	0,04	0,01	0,02	0,07	-0,01	0,08
o Biodiversity, Health and Economy	0,02	0,09	0,02	-0,01	-0,02	-0,01	0,07
o Climate Change, Health and Economy	-0,03	-0,01	-0,02	0,00	0,00	-0,04	0,06

Findings about projects delivering impacts in multiple impact areas:

- Projects which delivered impacts in four of the impact areas were a bit more likely to have a formal monitoring system in place.
- Projects which delivered impacts in four or at least in three of the impact areas recorded and assessed their impacts more frequently using different quantitative and qualitative methods – especially when the projects had a biodiversity target.
- Citizen involvement in impact assessment and evaluation was much more frequent.
- With regards to evaluation methods, projects with climate and biodiversity goals were more likely to utilize quantitative measurement methods to record their impacts. Qualitative methods, such as focus groups and questionnaires were also more likely to be applied by the projects to record their impacts.

Table 113. Type of monitoring activities in the projects addressing multiple goals - variation from the overall sample.

	Presence of formal monitoring system	Information on recording/monitoring impacts	Citizens involvement in assessment/evaluation of the NBS intervention
Climate Change, Biodiversity, Health and Economy	0.04	0.11	0.27
Climate Change, Biodiversity, Health, Economy and Social Goals	0.02	0.10	0.30
Projects addressing at least three goals	-0.02	0.05	0.31

o Climate Change, Biodiversity And Health	0.02	0.06	0.26
o Climate Change, Biodiversity and Economy	0.04	0.11	0.29
o Biodiversity, Health and Economy	-0.03	0.07	0.32
o Climate Change, Health and Economy	0.02	0.08	0.29

Table 114. Types of methods used to evaluate the impacts of NBS used in projects delivering multiple impacts -variation from the overall sample.

	Interviews	Focus groups	Questionnaire surveys / online surveys	GIS data analysis	Measurements of biophysical aspects of the NBS	Observation	Other
Climate Change, Biodiversity, Health and Economy	0,00	0,04	0,02	0,00	0,04	0,00	0,05
Climate Change, Biodiversity, Health, Economy and Social	0,01	0,04	0,04	-0,01	0,02	-0,02	0,06
Projects delivering at least three impact categories	0,01	0,03	0,00	0,00	0,02	0,00	0,02
o Climate Change, Biodiversity And Health	0,00	0,01	0,00	0,00	0,06	0,00	0,02
o Climate Change, Biodiversity and Economy	0,00	0,05	0,05	0,00	0,04	0,02	0,04
o Biodiversity, Health and Economy	0,02	0,06	0,01	0,00	-0,01	-0,01	0,03
o Climate Change, Health and Economy	0,00	0,04	0,01	-0,01	0,03	-0,01	0,04

Table 115. Type of monitoring activities in the projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	Presence of formal monitoring system	Information on recording/monitoring impacts	Citizens involvement in assessment/evaluation of the NBS intervention
Climate Change, Biodiversity, Health and Economy	-0,03	0,01	0,10
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	-0,03	0,02	0,19
Projects delivering at least three goals and impacts categories	0,04	0,11	0,04
o Climate Change, Biodiversity And Health	0,04	0,08	0,01
o Climate Change, Biodiversity and Economy	0,02	0,09	0,09
o Biodiversity, Health and Economy	0,01	0,08	0,09
o Climate Change, Health and Economy	-0,04	0,04	0,09

Table 116. Types of methods used to evaluate the impacts of NBS used in projects addressing multiple goals and delivering multiple impacts - variation from the overall sample.

	Interviews	Focus groups	Questionnaire surveys / online surveys	GIS data analysis	Measurements of biophysical aspects of	Observation (including virtual surveillanc	Other
Climate Change, Biodiversity, Health and Economy	-0,04	0,02	0,00	0,01	0,03	-0,07	0,09
Climate Change, Biodiversity, Health, Economy AND Social goals and impacts	-0,04	0,06	-0,02	0,02	-0,01	-0,07	0,19
Projects delivering at least three goals and impacts categories	-0,04	-0,07	-0,07	-0,03	-0,18	-0,16	-0,12
o Climate Change, Biodiversity And Health	-0,01	0,00	0,00	0,02	0,13	-0,01	0,04
o Climate Change, Biodiversity and Economy	-0,04	0,03	0,04	0,03	0,05	-0,01	0,11
o Biodiversity, Health and Economy	0,03	0,09	0,02	-0,01	-0,06	-0,02	0,07
o Climate Change, Health and Economy	-0,02	0,01	-0,02	-0,01	0,01	-0,07	0,07

Q6: What do we know about high-impact cases (i.e. delivering benefits in all four areas) in order to better understand how NBS directly lead to multiple benefits?

In this section, we study those cases that delivered impacts across the four studied sustainability challenges. We attempt to analyse whether NBS deliver the results they promised to do and identify the factors that make them more likely to produce these impacts. Specifically, we will address the following questions:

- What are some of the good practices that can be considered high-impact cases?
- Do high-impact cases have underlying goals that support the implementation?
- What are the implementation features and governance factors that characterise high-impact cases?
- Which features can predict the delivery of multiple impacts in the studied areas?

6.1. Examples of high-impact NBS cases

In the section below, we provide a list of high-impact NBS cases, which aimed to address the multiple challenges of climate adaptation, biodiversity protection, health and economic development and provided benefits in the same areas.

Table 117. Examples of high-quality NBS projects.

Name and city of the NBS intervention	Projects Focus	Urban Settings	Scale	Governance arrangement	Financing
Green interventions for Cibali forest Catania, Spain	Creation of new green areas Ecological restoration of degraded ecosystems	Urban parks: Large urban park or forest	Meso-scale	Co-governance or hybrid governance	50 000 - 100 000 EUR
Agrarian Park of Baix Llobregat Barcelona, Spain	Maintenance and management of urban nature Protection of natural ecosystems Knowledge creation and awareness raising Improved governance of green or blue areas	Urban parks: Large urban park or forest Food production areas	Meso-scale	Co-governance or hybrid governance	2 000 000 - 4 000 000 EUR
Peri-urban natural park of Collserola Barcelona, Spain	Maintenance and management of urban nature Ecological restoration of degraded ecosystems Protection of natural ecosystems	Grey infrastructure with green features Urban parks: Large urban park or forest	Meso-scale	Government-led	Above 4 000 000 EUR
City Island Park Tour Utrecht, Netherlands	Creation of new green areas Creation of semi-natural blue areas Ecological restoration of degraded ecosystems Protection of natural ecosystems	Grey infrastructure with green features: Green playground/ school grounds, Riverbank greens, Urban parks: Green corridor Food production areas Blue areas: River/canal Green areas for water management	Micro-scale	Government-led	500 000 - 2 000 000 EUR
Green Roof-Number One, First Street Greater Manchester, UK	Creation of new green areas	External building greens: Green roofs, Green walls or facades	Sub-microscale	Led by non-government actors	Unknown
River Main: Restoration and floodplain consolidation Frankfurt am Main, Germany	Maintenance and management of urban nature Management of rivers and other blue areas	Urban parks: Large urban park or forest Blue areas: Lake/pond, River/canal, Wetland	Meso-scale	Government-led	Above 4 000 000 EUR
Seven Lochs Scotland's urban Wildlife Park Glasgow, Ireland	Protection of natural ecosystems Knowledge creation and awareness raising Monitoring of habitats and / or biodiversity Management of rivers and other blue areas	Blue areas: Wetland	Micro-scale	Co-governance or hybrid governance	Above 4 000 000 EUR
Green Space at the Andromède Ecodistrict Toulouse, France	Creation of new green areas	External building greens: Green roofs, Green walls or facades Grey infrastructure with green features: Street trees Urban parks: Pocket parks / neighbourhood green spaces, Green corridor	Micro-scale	Co-governance or hybrid governance	Above 4 000 000 EUR

		Food production areas: Community gardens Green areas for water management: SUDs			
Shore Park Austraße Stuttgart, Germany	Creation of new green areas, Maintenance and management of urban nature	Grey infrastructure with green features: Green playground/ school grounds Urban parks: Pocket parks / neighbourhood green spaces Blue areas: River/canal Green areas for water management: Rain gardens	Micro-scale	Government-led	500 000 - 2 000 000 EUR
Green roofs in Findorff Bremen, Germany	Creation of new green areas	External building greens: Green roofs	Sub-microscale	Led by non-government actors	Unknown
Restoration of the Emscher River Essen, Germany	Creation of new green areas, Management of rivers and other blue areas	Grey infrastructure with green features: Green playground/ school grounds, Riverbank greens Urban parks: Large urban park or forest Blue areas: River/canal Green areas for water management: SUDs	Meso-scale	Co-governance or hybrid governance	Above 4 000 000 EUR
Medway Green Grid Medway, UK	Creation of new green areas, Maintenance and management of urban nature, Knowledge creation and awareness raising	Grey infrastructure with green features: Street trees, Railroad bank and tracks, Green playground/ school grounds, Institutional green space, Riverbank greens Urban parks: Large urban park or forest, Pocket parks / neighbourhood green spaces, Green corridor Food production areas: Allotments, Community gardens, Blue areas: Wetland	Meso-scale	Government-led	Above 4 000 000 EUR
Regeneration of San Girolamo waterfront Bari, Italy	Creation of new green areas, Coastal landscape management or protection	Grey infrastructure with green features: Street trees Blue areas: Sea coast	Micro-scale, Sub-microscale	Co-governance or hybrid governance	Above 4 000 000 EUR
Hellenikon Metropolitan Park Athens, Greece	Creation of new green areas Maintenance and management of urban nature Transformation of previously derelict areas	Grey infrastructure with green features: Street trees, House garden, Green playground/ school grounds, Green parking lots Urban parks: Large urban park or forest, Pocket parks / neighbourhood green spaces, Green corridor Food production areas: Allotments, Community gardens Blue areas: Sea coast	Meso-scale	Co-governance or hybrid governance	Above 4 000 000 EUR

		Green areas for water management: Rain gardens			
Wetland adaptation in Attica Region Athens, Greece	Coastal landscape management or protection Protection of natural ecosystems Strategy, plan or policy development Monitoring of habitats and / or biodiversity Management of rivers and other blue areas	Blue areas: Wetland	Meso-scale	Government-led	Above 4 000 000 EUR
Stavros Niarchos Foundation Cultural Center (SNFCC) Athens, Greece	Creation of new green areas Knowledge creation and awareness raising	External building greens: Green roofs Grey infrastructure with green features: Street trees, Green playground/ school grounds, Institutional green space Urban parks: Large urban park or forest Blue areas: River/canal Green areas for water management: SUDs	Micro-scale	Co-governance or hybrid governance	Above 4 000 000 EUR
Mill Leat Restoration, Bute Park Cardiff, UK	Creation of semi-natural blue areas Ecological restoration of degraded ecosystems Transformation of previously derelict areas Knowledge creation and awareness raising Improved governance of green or blue areas	Urban parks: Large urban park or forest Blue areas: Lake/pond	Micro-scale	Government-led	Above 4 000 000 EUR
Port Sunlight River Park Wirral, UK	Creation of new green areas Coastal landscape management or protection Transformation of previously derelict areas Monitoring of habitats and / or biodiversity	Urban parks: Large urban park or forest Blue areas: Lake/pond, Wetland	Micro-scale	Co-governance or hybrid governance	2 000 000 - 4 000 000 EUR
Building the town of NyE Århus, Denmark	Creation of new green areas Maintenance and management of urban nature Ecological restoration of degraded ecosystems Management of rivers and other blue areas	Urban parks: Pocket parks / neighbourhood green spaces Blue areas: Lake/pond, Wetland Green areas for water management: SUDs	Micro-scale	Co-governance or hybrid governance	Above 4 000 000 EUR
Green roofs in Hamburg Germany, UK	Creation of new green areas Knowledge creation and awareness raising Strategy, plan or policy development	External building greens: Green roofs Urban parks: Pocket parks / neighbourhood green spaces Green areas for water management: SUDs	Meso-scale, Sub-microscale	Co-governance or hybrid governance	2 000 000 - 4 000 000 EUR
Connswater Community Greenway Belfast, UK	Creation of new green areas Protection of natural ecosystems Improved governance of green or blue areas Management of rivers and other blue areas	Grey infrastructure with green features: Riverbank greens Urban parks: Large urban park or forest, Green corridor Blue areas: River/canal	Micro-scale	Co-governance or hybrid governance	2 000 000 - 4 000 000 EUR

5 new stormwater retention basins Marseille, France	Coastal landscape management or protection	Blue areas: Sea coast Green areas for water management: SUDs	Meso-scale	Co-governance or hybrid governance	Above 4 000 000 EUR
Family gardens of Montpellier Montpellier, France	Creation of new green areas Maintenance and management of urban nature Knowledge creation and awareness raising	Food production areas: Allotments, Community gardens	Meso-scale	Co-governance or hybrid governance	50 000 - 100 000 EUR
Agriparc of Mas Nouguier Montpellier, France	Maintenance and management of urban nature Knowledge creation and awareness raising	Urban parks: Large urban park or forest Food production areas: Horticulture Blue areas	Micro-scale	Co-governance or hybrid governance	500 000 - 2 000 000 EUR
Parc Marianne ecodistrict Montpellier, France	Creation of new green areas	Grey infrastructure with green features: Street trees, Green playground/ school grounds Urban parks: Large urban park or forest, Pocket parks / neighbourhood green spaces, Green corridor Food production areas: Horticulture Blue areas	Micro-scale	Co-governance or hybrid governance	500 000 - 2 000 000 EUR
Future Bruyères Park with an edible forest Rouen, France	Creation of new green areas Transformation of previously derelict areas	Grey infrastructure with green features: Green playground/ school grounds Urban parks: Large urban park or forest Food production areas: Horticulture Green areas for water management: Swales	Meso-scale, Micro-scale	Co-governance or hybrid governance	Above 4 000 000 EUR
Wetland of Repainville Rouen, France	Ecological restoration of degraded ecosystems Protection of natural ecosystems Monitoring of habitats and / or biodiversity Management of rivers and other blue areas	External building greens: Green walls or facades Grey infrastructure with green features: Railroad bank and tracks Urban parks: Large urban park or forest Food production areas: Allotments, Community gardens, Blue areas: Lake/pond, Wetland	Meso-scale, Micro-scale	Co-governance or hybrid governance	500 000 - 2 000 000 EUR
Green Campus at the National Veterinary School of Toulouse Toulouse, France	Maintenance and management of urban nature	Urban parks: Large urban park or forest Food production areas: Community gardens Blue areas: Lake/pond Green areas for water management, Rain gardens	Sub-microscale	Led by non-government actors	10 000 - 50 000 EUR

Nine Lakes Project Wakefield, UK	Creation of new green areas Improved governance of green or blue areas Management of rivers and other blue areas	Urban parks: Large urban park or forest Blue areas: Lake/pond, River/canal	Meso-scale	Co-governance or hybrid governance	Above 4 000 000 EUR
City-Park Urban project at Plaine Achille Saint-Etienne, France	Creation of new green areas	External building greens: Green roofs Grey infrastructure with green features: Street trees Urban parks: Large urban park or forest Green areas for water management: Swales Derelict areas	Micro-scale	Government-led	500 000 - 2 000 000 EUR
Green and Blue Corridors Enhancement Plan Saint-Etienne, France	Creation of new green areas Ecological restoration of degraded ecosystems Strategy, plan or policy development	Grey infrastructure with green features: Street trees, Railroad bank and tracks Urban parks: Large urban park or forest, Green corridor Food production areas: Community gardens Blue areas: Lake/pond, Wetland	Meso-scale	Co-governance or hybrid governance	Above 4 000 000 EUR
Eco-district Desjoyaux Saint-Etienne, France	Creation of new green areaMaintenance and management of urban nature	Grey infrastructure with green features: Street trees Urban parks: Pocket parks / neighbourhood green spaces Food production areas: Community gardens Green areas for water management: Swales, SUDs	Micro-scale	Government-led	2 000 000 - 4 000 000 EUR
Danube Eco-District Strasbourg, France	Creation of new green areas	External building greens: Green roofs Grey infrastructure with green features: Street trees, House garden, Green playground/ school grounds, Riverbank greens Urban parks: Green corridor Food production areas: Allotments, Community gardens Blue areas: Lake/pond, Wetland Green areas for water management: Swales, SUDs	Micro-scale	Co-governance or hybrid governance	Above 4 000 000 EUR

6.2. Do high-impact cases have underlying goals to support the implementation?

This section examines whether goal setting before project implementation supports impact delivery. The table below shows the number of projects that set goals for all four or at least three of the studied sustainability challenges, delivered impacts in these areas.

Table 118. Sustainability goal and impact combinations and number of projects addressing these goals

	Number of projects setting the goals	Number of projects delivering impacts	*Number of projects setting goals and delivering impacts in the same areas*
Climate Change, Biodiversity, Health and Economy	57	134	***33***
Projects addressing at least three goals	254	464	*181*
Climate Change, Biodiversity and Health	151	274	*108*
Biodiversity, Health and Economy	103	248	*69*
Climate Change, Biodiversity and Economy	65	170	*39*
Climate Change, Health and Economy	106	174	*64*

Our analysis suggests that it is not a prerequisite for projects delivering multiple impacts to set underlying goals. Many of the analyzed NBS projects delivered results in the studied impact areas, without introducing sustainability goals in the same areas. Overall, impact delivery seems more incidental without goal setting, but is more likely when underlying goals support the implementation (See Figure 35).

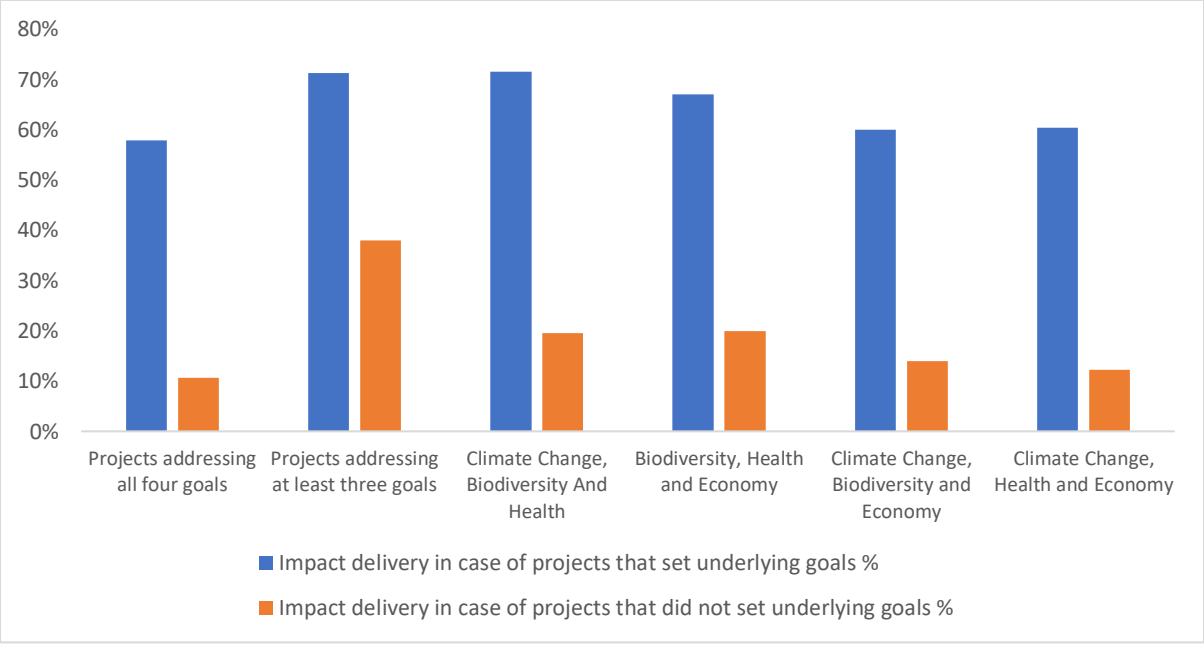


Figure 37. Impact delivery rate of projects that set an underlying goal vs. Impact delivery rate of projects that have no underlying goal

The same results can be concluded when impact delivery is examined separately for the studied sustainability issues: climate change adaptation, biodiversity protection, health and economic development.

Table 119. Sustainability goal and impact combinations and number of projects addressing these goals

	Number of projects setting the goals	Number of projects delivering impacts	*Number of projects setting goals and delivering impacts in the same areas*
Climate change adaptation	435	484	348
Biodiversity	469	726	433
Health and well-being	727	694	593
Economic development	279	431	210

Impact delivery was much more probable when the NBS projects established a goal before the implementation. Benefits were the least likely for climate change adaptation without a set goal: only 24,07% of the projects without a goal could deliver related impacts. On the other hand, 57% of projects without biodiversity goals still identified or expected a positive effect on biodiversity.

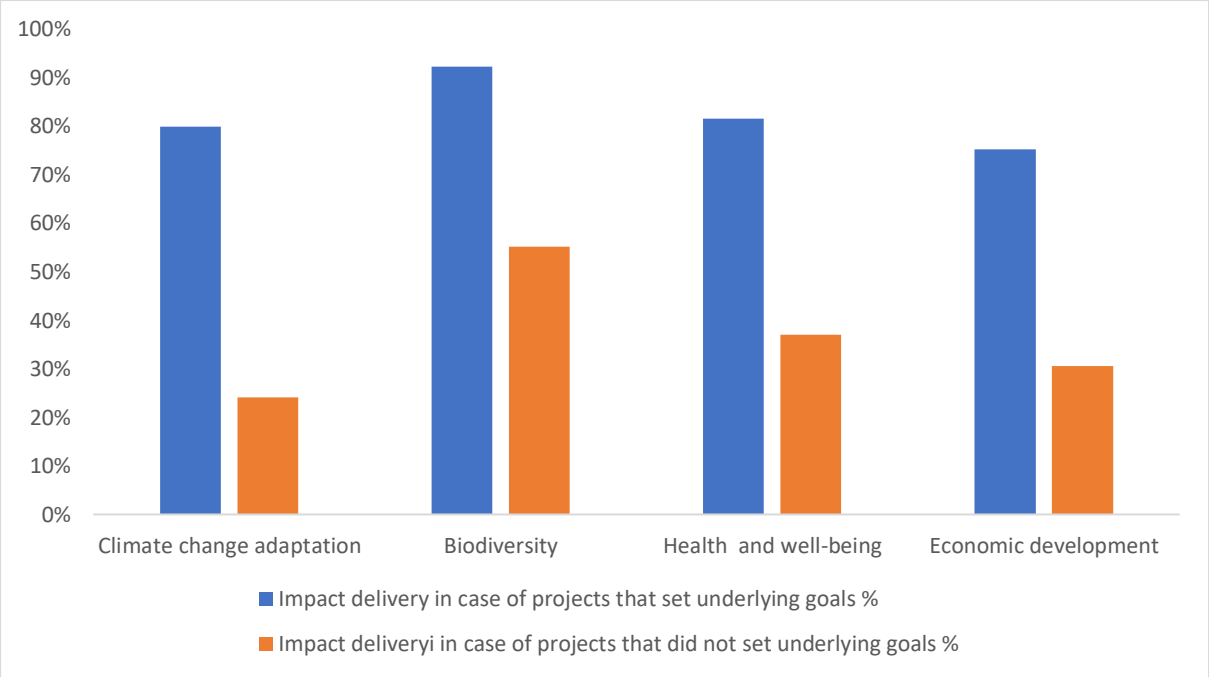


Figure 38. Impact delivery rate of projects that set an underlying goal vs. Impact delivery rate of projects that have no underlying goal

The analysis above also suggests that impact delivery in multiple areas is somewhat less probable than in the case of individual sustainability challenges. When examining individual goals, impact delivery varies between 75% to 92%. However, when projects aim to address multiple goals simultaneously, only 58% to 72% of the projects have delivered or expected multiple benefits. At the same time, the percentage of projects

that delivered multiple impacts without a pre-set goal varies between 11% to 38% - while impact delivery in individual challenge areas varies between 24% to 56%.

These results suggest that implementation of high-impact NBS cases - which can deliver multiple impacts simultaneously in the areas of climate change adaptation, biodiversity protection, health and economic development - is more challenging and even less likely without setting goals preceding the implementation.

6.3. What are the implementation features and governance factors that characterize these cases?

In this section, we aim to identify those implementation factors and governance characteristics that can potentially increase the delivery of high-impact cases with benefits for climate adaptation, biodiversity protection, health and economic development. To identify these factors, we made use of various statistical and machine learning methodologies, including multivariable analysis and linear regression analysis.

6.3.1. Implementation characteristics

Our analysis identified several implementation features which are more likely to be associated with high-impact cases. These features include project types, urban settings, spatial scale, total budget and financing architectures.

With regards to **urban settings**, our analysis suggests that blue areas, green areas for water management and, to a lesser extent, parks and urban forests exhibited a stronger correlation with high-impact cases. At the same time, community garden projects seem not to foster the delivery of multiple impacts.

Among the different **types of NBS projects**, the analysis identified three categories that have a higher potential to deliver benefits in the studied sustainability challenge areas. These included:

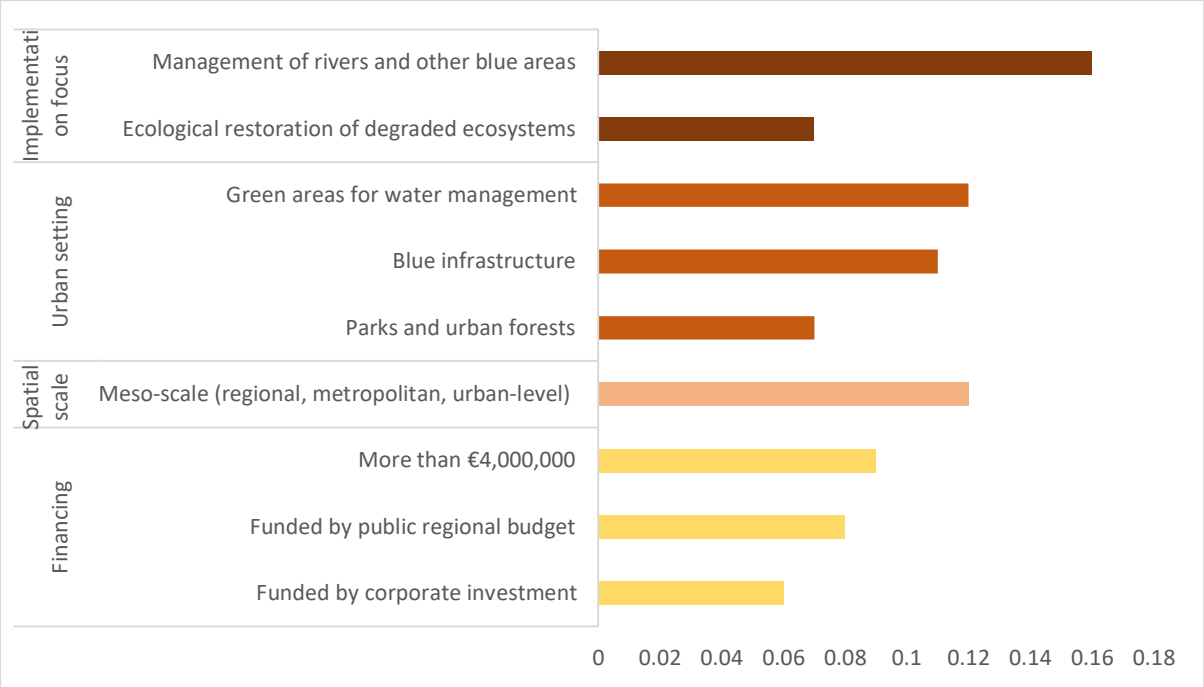
- Management of rivers and other blue areas
- Ecological restoration of degraded ecosystems
- Protection of natural ecosystems
- Strategy, policy and plan development

In terms of **spatial scale**, a weak correlation was confirmed between multiple impact delivery and regional or urban-level (meso-scale) implementation. At the same time, a weak negative correlation could be identified with sub-micro-scale implementation.

Projects with a budget above EUR 4 million also had more significant potential to deliver multiple impacts. However, since information on project costs was missing in the case of 35% of the projects, this result might have been influenced by stronger monitoring and documenting capacity of projects with a larger budget. In addition, the involvement of local and regional public authorities as financing organizations, represented a potentially relevant stimulus for delivering multiple benefits.

A summary of implementation characteristics, which are likely to increase the delivery of multiple benefits is summarized in the figure below.

Figure 39. Implementation features of NBS projects with higher likelihood to deliver climate impacts.



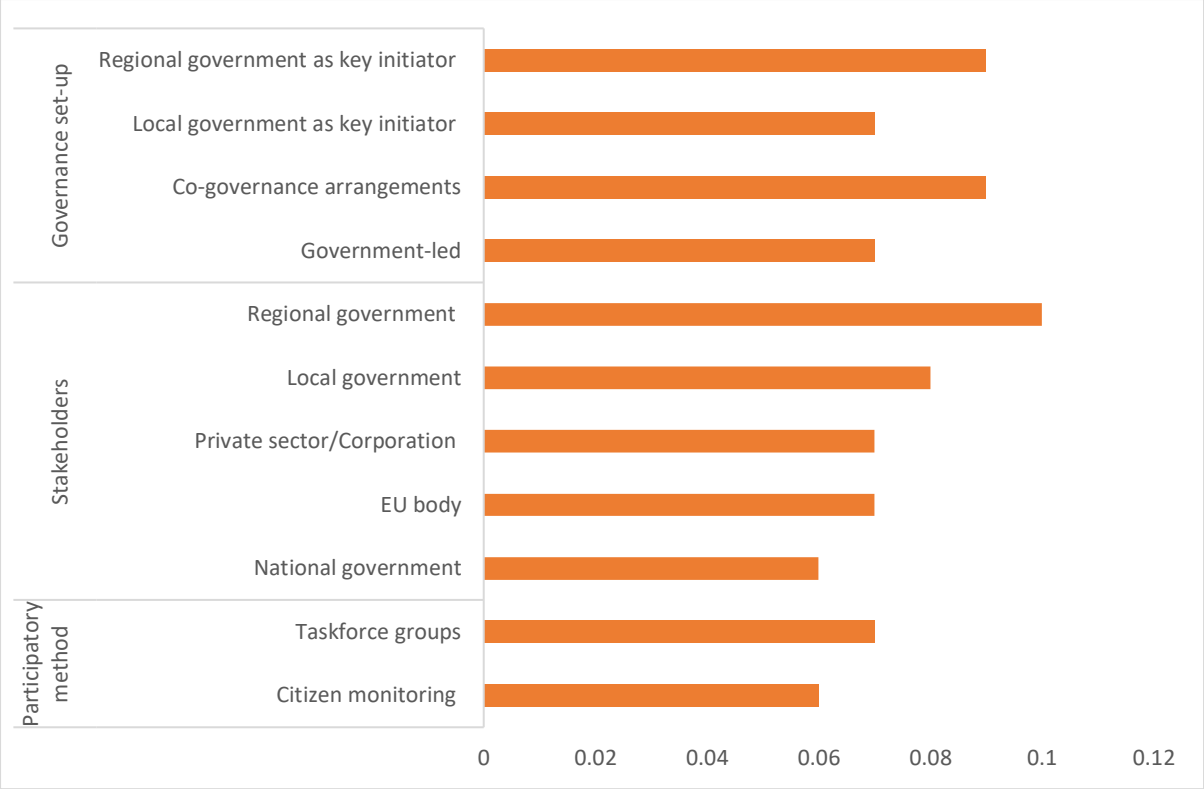
6.3.2 Governance characteristics

Our analysis also identified positive influence of governance characteristics on the implementation of high-impact cases.

The analysis indicates that projects implemented in co-governance arrangements, especially those initiated by regional and local governments, are somewhat more likely to provide multiple benefits. When projects are implemented in co-governance arrangements, private actors, EU bodies and multilateral organizations also stand out as potentially important actors for the increased delivery of multiple impacts.

The results also highlighted the potential importance of citizen involved via citizen monitoring activities to oversee project implementation and results.

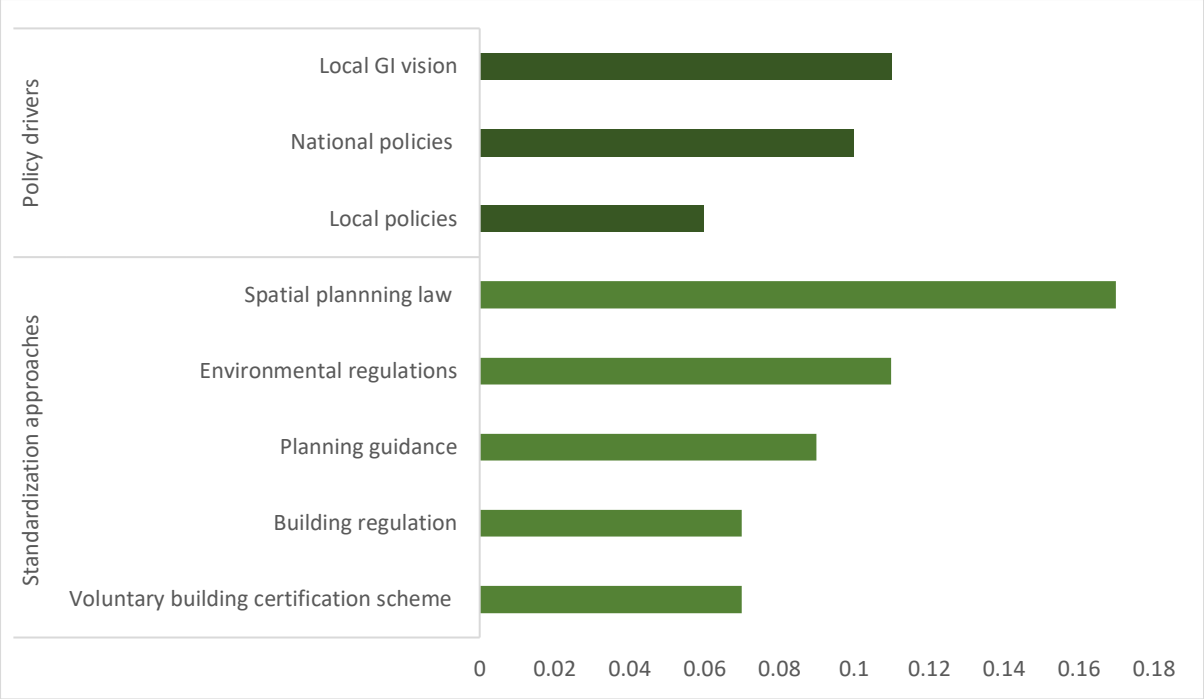
Figure 40. Governance characteristics of NBS projects with higher likelihood to deliver multiple impacts.



The results also suggest that relevant EU, national and local strategies and policies could act as drivers for implementing NBS projects with multiple benefits. A moderate correlation can also be identified when cities have an pre-existing NBS/GI vision or strategy in place, these can also positively influence the implementation outcomes for high-impact cases.

The analysis also confirmed that when projects are implemented to ensure regulatory or policy compliance, it also increases the likelihood of providing multiple benefits. Among mandatory mechanisms, environmental regulations and spatial planning laws stand out as potentially important measures. In addition, voluntary building certification schemes also seem to have a positive influence on delivering high-impact cases.

Figure 41. Policy drivers of NBS projects with higher likelihood to deliver multiple impacts.



6.3.3. Feature prediction

In addition to using multivariate analysis to identify correlation between implementation and governance features and high-impact cases, we have also developed a linear regression model to predict which of these features are more likely to predict high-impact case implementation. In a linear regression model, the calculations assume a linear relationship between the implementation and the governance features, as well as the delivery of multiple impacts.

First, the model assigns a feature weight for each feature based on the data of the 1000 European projects. The prediction of the impact is based on the summed feature weights of the features present in a project. A higher feature weight implies a stronger relationship between the feature and the delivery of multiple impacts but the frequency of the feature's occurrence affects this relationship too. To mitigate the effect of the great variance in feature occurrence, the feature weights and feature occurrences are multiplied together and the result is used to estimate the strength of the relationship.

The feature prediction analysis suggests that certain implementation and governance features predict the delivery of multiple benefits for climate adaptation, biodiversity protection, health and economic development with a higher likelihood. In terms of project focus, parks and urban forests, blue infrastructure, green areas for water management and green building projects are more likely to deliver multiple impacts. With regards to implementation focus, the creation and the management of urban nature as well as the ecological restoration of degraded ecosystems can predict multiple impact delivery. The analysis also suggests that projects with a larger budget (above EUR 500 000) are well equipped to provide multiple benefits.

Certain governance characteristics are also positive predictors. These include government-led and co-governed projects that are more likely to provide multiple impacts. In addition, the analysis also confirmed the importance of policy drivers.

There are several types of policy drivers which can influence multiple impact provisions. These included local GI visions, national level policies, plans or programmes and standardization mechanisms, including environmental regulations, environmental standards, and voluntary building certification schemes. Lastly, our analysis indicates that projects financed by regional or local governments and corporations are more prone to provide multiple benefits, especially when the financing is provided in the form of grants or subsidies.

Figure 42. Implementation and governance features predicting the delivery of high-impact cases. (on a scale from 1-100)