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Understanding Investor Confidence in the Green Infrastructure and Nature-Based Solutions Sectors

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Introduction and Context

A key objective of the IGNITION project has been to increase confidence levels for investment in green infrastructure (GI) and nature-based solutions (NBS) by 2021. For the purposes of the IGNITION project, investor confidence is defined as:

"the willingness of potential investors to commit funds to GI and NBS for the purposes of receiving a return on that investment, whether those returns be social, environmental and/or financial."[1]

A range of investors can potentially engage in GI and NBS schemes. Greater Manchester's (GM) Natural Capital Investment Plan (NCIP) sets out the challenge of increasing private investment into natural capital, moving beyond the public and philanthropic funding that provides the main source of investment into GI and NBS at present. Looking to help address this challenge and drive forward greater GI and NBS investment, IGNITION aimed to understand the extent to which investors are confident in investing in GI and NBS and to track their confidence levels over the duration of the IGNITION project.

In order to achieve this an interview-based approach was undertaken, which consisted of two key components. The first comprised the numerical ranking of self-reported investor confidence assessed towards the beginning and end of the IGNITION project. This allowed for broader changes in confidence levels to be assessed. The second element focused on the qualitative evaluation of stakeholder attitudes towards investment, based on a set of semi-structured interview questions. Whilst confidence rankings give a useful indication of changes in investment status over time, this qualitative analysis helped to develop a deeper understanding of the institutional and policy contexts underlying NBS investment alongside the challenges and potential opportunities facing investors when considering GI options.

This report begins with a description of the methodology followed during this study. It then discusses different perceptions of investor confidence across stakeholder groups, and the results of the confidence ranking. The report further outlines barriers that are constraining investor confidence to engage in GI and NBS schemes, and approaches that could be taken to address these.

[1] Adapted from Ko, 2017. Ko, K.J., 2017. Economics note: investor confidence. US Securities and Exchange Commission.

Methodology

The participants engaged in this research came from a broad cross section of potential investor types, based on those identified in the GM NCIP[2] and additional core stakeholders. Overall, respondents included private sector investors, philanthropic/charitable investors, representatives from the public sector, local and central government, and intermediary organisations. A summary is provided below in Table 1: Interview respondents by category, with a full list of respondents and interview keys in Appendix 1.

Table 1: Interview respondents by category

Type of stakeholder	Interviewed in Round 1	Interviewed in Round 2
Government (Central and Local)	3	4
Property Developer / Landowner	3	2
Public Investors	1	1
Private Investors	3	1
Charitable Investors	1	0
Advisors / Consultants	0	2

In total, 21 interviews were undertaken. These split into two rounds, firstly towards the beginning (between November 2019 and January 2020) and secondly towards the end of the IGNITION project (August to October 2021). The initial aim was to work with a consistent group of respondents in order to observe changes in their level of confidence over time. However, this was not possible due to issues around availability, changes in job roles and changing involvement with the IGNITION project. Additionally, the first round of interviews had not included certain stakeholders whose perspectives emerged as important as the project progressed. A number of new interviewees were therefore approached for the second round, based on recommendations by IGNITION partners. By engaging a broad range of investor types, this interview process has generated useful insights into factors shaping investor confidence in the wider GI and NBS investment landscape.

The interviews were conducted via phone or Zoom and lasted around 30-45min. The questions were mainly qualitative in nature, with one semi-quantitative prompt to rank current levels of investor confidence in GI and NBS on a scale from 1 to 5. In the first round of interviews, the questions aimed to elicit information around opportunities for and barriers to investment, and to capture a measurable baseline of investor confidence. The core themes emerging from these interviews then provided the foundations for the follow-up set of questions that formed the basis of the second round of interviews, including a repeat confidence ranking. A full list of interview questions and prompts is provided in Appendices 2 and 3. Interview quotes are accompanied by a referenced numbering system. If the reference is preceded by 1 (e.g. Interview 1-2) then that interview took place during the first

[2] Eftec, 2019. A Greater Manchester Natural Capital Investment Plan, GMCA, Manchester.

round. References preceded by a 2 (e.g. interview 2-5) took place during the second round of interviews.

A number of caveats are associated with this methodology to assess investor confidence:

- It was not possible to measure the confidence level with the same set of interviewees. Thus, the ranking reflects a broader view of different investment stakeholder groups across two points in time.
- The ranking is self-reported and the scale open to individual interpretation, which may impact the scores provided. In some cases, respondents gave further qualitative comments to explain their assessment.
- Interviewees targeted already expressed an interest in the use of nature-based solutions which could introduce bias. They are likely to be over-representative of a group of investors and intermediaries who are familiar with, and appreciative of, nature-based solutions. Confidence may therefore be higher amongst these groups.

Understanding investor confidence

Before discussing the investor confidence rankings and related themes, it is notable that different types of investors bring varying expectations (and definitions) of the nature of investment in GI and NBS. In particular, there are different views on the extent to which there is a need to realise an increased financial return on investment. Philanthropic investors appear to be happy with covering their initial investment and seeing, at some point in the future, wider intangible benefits emerging from their investment. Amongst private sector investors there was an identified need to ensure that their investments generated more revenue than had initially been provided:

'The key point … is the definition of investment: [that's] investing money in order to make a profit. (…) And a fundamental thing about it, is that you owe people their money back. So there are two things, you need to be able to invest money to pay people back and to pay them more back than they invested in the first place. And if you can't achieve those two things then you fly in the face the fundamental basis of investment, and you need to call it something else.' (1-9, Private Green Investor)

'If you haven't got a revenue stream, then you haven't got an investment as you have no way of getting your money repaid – otherwise that's a donation or grant.' (1-11, Private Green Investor)

Confidence, for most interviewees, was hard to define but generally centred on the notion that the perceived benefits associated with an investment, whether these are for social, environmental, and/or financial benefits, could reasonably be expected to be realised based on previous experience or example case studies from elsewhere. A philanthropic investor, for example, noted that their organisation was more likely to approve investment in a particular project where they could be confident that the lead for that project would be able to repay that investment:

'We want to ensure that there is a good repayment facility which is why we mainly lend to bigger organisations…it is the repayment facility that we need to be confident on.' (1-10, Charitable Investor)

While the emphasis lies on financial returns, other considerations also feed into investor confidence perception. Property developers and landowners operating within GM over the longer term, for example, considered reputational returns as well reducing the risk of certain climate impacts, such as flooding. Further, a frequently cited concern here is whether the promoted benefits of GI would stand up in practice, and if so, how this is demonstrated and evaluated. These issues illustrate the complex nature of investor confidence and will be addressed further in the sections below.

Ranking of investor confidence

Investor confidence levels were assessed via a self-reported ranking during the interviews, based on a scale of 1 to 5, where 1 is lowest confidence and 5 is highest. The average score from the first round of interviews was 2.4, compared to 2.77 in the second round (see Table 2). This shows a slight increase in investor confidence over a period of 18-24 months, although it is not possible to identify specific drivers behind this change. The wider range in scores given in the second round is notable, ranging from 1.5 to 4 compared to a range of 2 to 3 in round one, indicating greater variation based on different considerations around confidence to invest in GI and NBS.

Table 2: Investor Confidence Scores

	Round 1: Nov 2019 – Jan 2020	Round 2: Aug 2021 – Oct 2021
Number of respondents	10	9
Average score	2.4	2.77
Lowest score	2	1.5
Highest score	3	4

For both interview rounds, respondents gave further explanations of their scores, either unprompted or following further questioning. In the first round, interviewees were highly aware of and receptive to the agenda of climate change adaptation, with a general understanding that GI and NBS were beneficial in this respect. However, the key reasons that their confidence to invest could not be ranked higher was because the returns on investment (whether financial, environmental, or social) were too uncertain and the business cases around NBS were yet to be proven. For example, a respondent from the health sector noted that:

'I kind of see the benefits, but it is just quite difficult to build the case to invest amongst the people that hold the financial keys.' (1-4, Public Investor – Health Sector)

This gap remained visible in the second round, although there was a sense that the need for and benefits of GI and NBS are increasingly being demonstrated. Several interviewees clearly made a distinction between awareness of NBS options and their benefits, and the confidence to invest in them, but also pointed to the progress that had been made:

'I think investor interest has probably improved. I am not sure about investor confidence though.' (2-1, Central Government)

'I think if you'd asked me two years ago, [investor confidence ranking] would have been one, because it was so unproven, so many risks attached to it. And I think some of those have been dealt with. So there has been tangible progress.' (2-5, Local Government)

The main challenge is that the mechanisms needed to implement projects to achieve GI and NBS benefits in practice are not sufficiently developed, and this is holding back investor confidence. The following sections will take a more detailed look at these concerns, based on the interview responses given by the research participants.

Factors constraining the confidence of investors to engage in GI and NBS projects

The analysis of the interview responses, particularly from the first round of interviews but with some additional comments from the second round, identified four key factors, or barriers, that currently act to constrain investor confidence in the GI and NBS field. These are:

1. The embryonic state of the market
2. Perceptions of, and the need to share, risk
3. Gaps in the evidence base and a lack of appropriate demonstration projects and case studies
4. Lack of guarantee over long-term performance, and issues of maintenance

Each factor is addressed in turn, drawing on quotes from the interviewees. This provides a platform for considering approaches to increase investor confidence around GI and NBS, which are discussed in the next section of this report.

1) The embryonic state of the market

The market for NBS is relatively new, and 'first adopter' investors who tend to be prepared to accept a higher degree of risk when making investments are currently lacking. All investors, whether they are private, public or from a charitable background, referred to the novelty of the GI and NBS market and the difficulty to build an investment case in such an environment. Investors are generally not confident in investing in markets that are completely new:

'Everything comes back to this one point: investors struggle to get their head around something new.' (1-6, Private Green Investor)

Some types of environmental markets, such as sustainable forestry, are well established in the context of climate mitigation, and organisations such as Defra are trying to stimulate new markets in environmental technologies broadly. However, in most cases, issues relating to the natural environment are seen to be the public sector's responsibility and should therefore be funded through grant giving. When it comes to climate adaptation, ideas around monetisation and investment have yet to receive mainstream appreciation:

'I think the whole concept of generating a revenue stream through monetising natural capital benefits is probably a new one.' (1-3, Central Government)

The point was reiterated by a charitable investor who highlighted the challenge of getting their sector to move beyond the idea that non-repayable grants should be the main means of financing GI and NBS:

'Now I think that there is a historical, cultural angle to this. I'm dealing with the third sector and they often just expect grants. There is a bit of certain organisations thinking that we give money rather than repaying.' (1-10, Charitable Investor)

Alongside a cultural shift, the embryonic state of the market manifests itself primarily in how actors perceive and respond to risk. A common response is to look for actors willing or able to take the initial steps in investment. One interviewee believed that the focus for attracting investment should currently be on innovative foundations and first mover investors. As noted by a government respondent, private investors frequently look to the public sector here:

'…in terms of hard edged, commercial investment from which you would expect a market rate of return - well, it's still early days there and I think that they are kind of looking at

government to take the first loss position, and to do some of that risk sharing, and to take some of that risk away for them.' (1-3, Central Government)

This points to a central role of risk perception and sharing as constraints to investor confidence, which are introduced below.

2) Perceptions of, and the need to share, risk

The theme of sharing risk, and demands for the public sector to take a large share of that risk in the first instance, was common among the private sector investors. During a conversation around the importance of public-private partnerships to the developing wind energy markets almost a decade ago, a private investor stated that:

'If you want to mobilise the private sector, then you need public sector capital to underscore it.' (1-6, Private Green Investor)

However, the challenges here include the retrenchment in public finances in the UK over the past decade.[3] Traditional providers of urban GI and NBS including local authorities are facing austerity driven budget cuts that are limiting their capacity to invest.

'…at the moment, our local authorities are predominantly emptying bins and mowing grass, there isn't any time for that additional add on.' (2-3, Local Government)

In addition to the decline in public finances, the lack of statutory instruments to demand NBS measures in developments, means that NBS may be proposed in a scheme but due to costs can often be removed before implementation:

'…austerity is doing a great job of letting people value engineer almost anything of added value out so that you are left with just the core of what you are expected to deliver.' (1-2, Local Government)

Amongst the philanthropic investors there was an acknowledgement that they were happy to share risk, but only where they could guarantee that there would be payback:

'So if we have confidence in a scheme, then we will put in the money upfront knowing that the government money will come good at some point. So we take away the risk for the third sector organisations.' (1-10, Charitable Investor)

[3] Mell, I., 2017. Financing the future of green infrastructure planning: alternatives and opportunities in the UK Financing the future of green infrastructure planning: alternatives and opportunities in the UK. Landscape Research. https://doi.org/10.1080/01426397.2017.1390079

This highlights that the process of accessing funding for GI measures is a plural activity. It is not just about targeting dominant actors, but accounting for the interactions between stakeholders and their varying roles. This points to the need for partnership development, which is addressed later in this report.

Not only was risk sharing deemed to be important, but an explicit acknowledgement of the risks involved was also necessary for investors. This is challenging given the novelty of this market, where there are no precedents, models and prior experiences to draw from. As one respondent involved in trying to stimulate new markets in NBS noted:

'There is no track record for investors to fall back on. I think that this makes it more risky for investors and some of the experience that we have had is that investors are cautious and keen to have all of the risks identified – not necessarily all of them being 100% totally mitigated.' (1-3, Central Government)

As a result, identifying and describing risk factors in NBS investment is a key requirement in improving investor confidence. To do so, a robust evidence base is required from which NBS risk and benefits can be assessed, particularly from a financial perspective. The current gaps in this data, and a lack of real life demonstration projects that show how schemes can work in practice, are addressed in the next section.

3) Gaps in the evidence base and a lack of appropriate demonstration projects and case studies

Many interviewees referred to the need for more case studies and evidence around the financial benefits of NBS. It was recognised that the evidence on wider benefits such as environmental and social goals was compelling and abundant. However, there was a perceived lack of practical case studies that outline issues including length of time from project inception to realisation, the financial returns, and the wider benefits that could be expected particularly around risk reduction, e.g. from flooding. In effect, what is missing are case studies developed under the influence of market conditions. On this theme, one interviewee noted that their biggest gap is:

'…not having that evidence base to say to clients that if you do put the money into this, you will get return on that investment.' (2-6, Private Consultant)

The ability to clearly demonstrate value in quantified terms is essential to position NBS as a feasible alternative. As several respondents pointed out, unless you can present convincing data on performance and returns, investors will stick to their tried-and-tested conventional approaches. It also matters where this data comes from. Here, the role of independent research was highlighted:

'Lots of people talk about the additional benefits and people say 'Oh, it will do x, y, z' But the people talking like that are always the suppliers of the green roof. There needs to be some kind of independent body that is able to show the figures and stress the benefits these [green roofs] as well. And I think that would increase investor confidence.' (1-1, Property developer)

It was also recognised that different types of GI and NBS require different types of evidence and cases studies. As a result, whilst there are calls for more evidence, this needs to be targeted, using comparable metrics, where possible:

'…it is an emerging field. We are getting better at tracking the flows of benefits that come from the natural environment but there is not a standardised away to understand those metrics.' (1-3, Central Government)

In this context, interviewees widely agreed that demonstration projects (such as IGNITION project Living Lab at the University of Salford) would be helpful to begin to see the benefits of GI and NBS. However, the metrics used to demonstrate these benefits needed to be meaningful and placed in a language of risk that they, particularly the private sector respondents, can understand.

4) Lack of guarantee over long-term performance and maintenance

A further limitation on investor confidence concerned the lack of long-term guarantees about the performance of NBS projects. Investors need to see the long-term viability of particular products in order to make any related investment. This links to the longevity of revenue streams from GI and NBS investments, which in some cases might be tied to funding mechanisms that are beyond the control of the investor:

'Without that guarantee, it's quite hard for investors to invest in these proposals. Because they don't know the long-term sustainability of the income stream that underpins their investment.' (2-7, Private Investor)

A related question is who can provide the necessary guarantees, and how these assurances can be underpinned, as pointed out by a public sector investor:

'You need to know that the product will do what it says that it will do. So, who do you get your warranty from? A reputable company will charge more. What have the companies done that they can warrant? And how do you factor in maintenance? There needs to be a regime around the actual kit too.' (1-7, Local Government)

The issue of maintenance was raised by several respondents. NBS installations require ongoing long-term care, in some cases with specialist skills, to keep them in prime condition. As well as questions about financial sustainability, this introduces additional barriers to

project development and confidence, if these skills are not readily available. One landowner said that they had to outsource a maintenance contract for green roofs and walls:

'We only have a small landscaping team and they don't feel qualified or specialised in these areas.' (1-8, Landowner)

While none of the barriers identified here - the embryonic state of the market, issues around risk sharing, gaps in the evidence base and lack of long-term guarantees – are likely to have a quick answer, the interviews also shed light on pathways to increase investor confidence. The most promising points emerging from this research are discussed below.

Building investor confidence to engage in GI and NBS projects

Recognising and building on the barriers outlined above, interviewees in both the first and second round of interviews highlighted a range of conditions and approaches that can help to build investor confidence around GI and NBS projects. These fell into four broad themes:

1. A stable and supportive policy environment
2. Developing new business models
3. Partnership development
4. Progressing demonstration projects and practical case studies

1) A stable and supportive policy environment

More guarantees over the long-term policy trajectory in this space could help to underpin trust that returns on investment will be realised. However, the often short-term nature of policy making cycles, current policy upheavals such as Brexit, and the resulting development of a new policy landscape, may mean that a stable policy landscape is harder to achieve in practice. Interviewees highlighted the importance of a stable and supportive policy environment to help drive confidence in GI and NBS investments. One property developer identified the push effect of mandatory planning regulation, and associated impacts on the market:

'I struggle to see how it's [GI and NBS] going to become mainstream unless planning dictates it and it becomes mandatory in planning that you have to do this. ... my opinion is, if you're forced to do something then it becomes more mainstream, then there are more players supplying the market. So the prices will start to drop because more people have to do it.' (2-2, Property developer)

Local authority stakeholders also highlighted the importance of policy incentives in helping to drive forward GI and NBS, further emphasising the importance of associated monitoring to help ensure that related projects deliver on their objectives:

'Policy incentives definitely would work…and then [you need to] ensure the ability of planning to actually monitor whether what you have committed to is actually happening.' (2-3, Local Government)

Contextual factors are important to consider when determining the extent to which policy frameworks are underpinning GI and NBS activity. Two interviewees (one philanthropic investor and one private green investor) pointed to the unique role that the Greater Manchester Combined Authority (GMCA) could play in encouraging policy stability in GM. Here, the emerging GM Environment Fund could provide much needed stimulus. Further, the GM Mayor could provide crucial leadership on the topic:

'You pull them [potential investors] together, you tell them that this is what you want to do, you get them to agree to that … They [the GMCA] are in an amazing position! What an amazing opportunity to get this stuff done.' (1-9, Private Green Investor)

This leadership also manifests itself through the development of relevant strategy documents, such as GI plans, which provide local government officers with the remit to dedicate resources to GI and NBS projects:

'We're really fortunate in Manchester, that we've got policy officer capacity .... So we have got a really good policy, well, really good strategy, that is seen as the hook for, and is the mandate for officers to go out and explore how the GI could be improved... So in terms of officers putting time into pursuing avenues for getting money, we have got a strategy that says that we can do that.' (2-8, Local Government)

Looking at policy frameworks more broadly, several interviewees identified the Environment Act as presenting potential opportunities here, particularly through the mandating of Biodiversity Net Gain (BNG) requirements for new developments. This could in turn help to stimulate the development of markets around the provision of biodiversity outcomes through embedding a legal requirement to invest in GI and NBS through the planning system. The emerging Environmental Land Management Scheme (ELMS) was highlighted as an opportunity in this respect:

'…when that [ELMS] comes online it is designed in a way that can really facilitate private venture investment alongside public investment. That will provide a lot of assurance.' (2-1, Central Government)

Other environmental policy arenas can serve as a model here of how supportive policy frameworks can help build confidence, if they have been in place for a sufficient amount of time. Respondents cited feed-in tariffs (FITS) in the renewable energy sector as a particular example:

'It is political certainty and stability that help investors – just look at FITS and wind power.' (1-7, Local Government)

Creating a supportive policy landscape to encourage GI and NBS investment requires activity at different spatial scales. Central government activity is key, but there is much that can be achieved at city and local scales. GMCA are in a key position to affect change, for example through lobbying central government and strengthening their own policy frameworks to positively influence activity in GM's ten local authorities.

2) Developing new business models

Currently, stakeholders believe that there are few business models tailored to implementing GI and NBS measures. Regarding SUDS, one interviewee noted that all models are currently bespoke, and that:

'…we don't really have active markets, we don't have active sets of technical standards, we don't have registries, we don't have the ability or platforms to bring together buyers and sellers.' (2-9, Financial Advisor)

Interviewees were asked what kinds of business models would suit their organisations. There were marked differences in response to this question across different sectors. Private sector investors and property developers, regardless of size, pointed to learning lessons from the renewables sectors and, where possible, resembling existing business models. Building on this theme, the smaller investors and property developers all raised the possibility of connecting NBS investment to energy efficiency measures because the latter are more readily received and understood across society. Combining climate change mitigation and adaptation also provides opportunities to exploit multiple benefits from GI and NBS. Building on the need to develop synergies between related agendas, interviewees noted that:

'I guess [that IGNITION should] piggyback on to something that is already an existing agenda and a pretty well known agenda, and one that is out there: how about that GI and zero carbon come together? Because I think its two different worlds of moments they don't overlap enough.' (1-5, Property Developer)

'I certainly think that there is some merit to considering the nature-based stuff and the climate reduction stuff. And why not jump on the coat tails of an issue that is front and centre of people's minds and they really want to see stuff done. (…) I don't think there is any shame in jumping on that bandwagon.' (1-9, Private Green Investor)

Public sector investors were more likely to appeal to the public good benefits of NBS that can not necessarily be monetised. This group of interviewees concentrated less on the immediate need to realise hard financial benefits as part of their business model:

'I think from my point of view, it's where we have a site and we don't have to put anything in just now but we get the savings later. That has appeal. That can be used as leverage and is a good business model for us … And if that could be tied to the resilience side of things then that would be helpful.' (1-4, Public Investor -Health Sector)

Regarding non-public sector interviewees, there were differences in the size and ethos of particular organisations, and this had an impact on their perception of investable projects. Larger investors want to invest large sums (upwards of £20 million). Given that nature-based solutions projects are often small scale in nature, two suggestions were made: either tie the NBS solution into an existing major development with incentives for providing NBS as opposed to conventional solutions or build a portfolio of smaller measures. For small green investment companies, the size of projects did not matter. What mattered, however, was an ability to ensure that there was a return on investment however small. For property developers, one way to bring GI and NBS into existing business mechanisms is via the building valuation process:

'So the biggest challenge for us at the moment is linking nature based solutions back into the valuation process for a building. Effectively it is not recognized. In all the different factors that add up to how much your building is worth, it doesn't consider sustainability.' (2-4, Property developer)

Several interviewees mentioned potential novel business models. One centred on leasing green walls, where a company installs and maintains a green wall for a property owner, who pays a monthly fee for this service. This was thought to be beneficial as it reduces risks to the property owner linked to GI and NBS interventions. Another model was the adoption of parks and greenspaces. In this proposal, private developers take on the long-term management and maintenance of urban parks and greenspaces in return for securing permission to build on a proportion of the park.

Although it is encouraging that there are potentially novel business models to consider, issues of capacity to implement these in practice have been raised, for example within local authorities with one representative noting that:

'We haven't got capacity to work with other landowners to develop those sorts of business models.' (2-8, Local Government)

Potential exceptions to the above are major joint venture developments in urban areas (e.g. the Mayfield and Northern Gateway projects in Manchester), where developers and landowners can progress schemes themselves (e.g. residents levy to maintain communal green spaces). Investment in retrofits also appears to be a more challenging proposition, as there is limited interest from the private sector and it is often associated with additional technical challenges. Factors such as this constrain the type of GI and NBS schemes that are likely to be financed.

While not directly related to the business models discussed, an important point concerns the potential reputational benefits to implementing GI and NBS for private sector companies. One interviewee noted that for commercial partners, the reputational benefit of being perceived as a 'green leader' may be more important than achieving specific tangible outcomes from GI or NBS. Similarly, achieving co-benefits and demonstrating social value can be important criteria for working with the public sector and implementing central government contracts. Given that GI and NBS measures can add to the cost of developments, these intangible benefits should be emphasised and promoted.

Developing appropriate business models will remain a challenge for NBS investment and financing. Experience gained within the IGNITION project on the co-investment in SUDS business model points towards the types of opportunity that do exist. While it is unlikely for ready-made solutions to emerge in the near future without sustained investment and capacity building in this field, with bespoke project-specific models therefore likely to remain the most common approach in the short term, the interviews suggest a range of leverage points through which investment in NBS can be made more practicable and attractive. Also crucial will be the development of partnerships to build business models that draw on the multiple benefits (and revenue streams) that GI and NBS have the potential to generate.

3) Partnership development

GI and NBS schemes often deliver multiple benefits to diverse stakeholder groups. This presents opportunities for shared financing and delivery of GI and NBS schemes where multiple beneficiaries collaborate to fund schemes from which they then derive different benefits. However, this feature of GI and NBS schemes also introduces difficulties. Challenges emerge where there is a mismatch between benefit providers or investors, and benefits recipients. At other times, the created benefits may be indirect, with attribution to a particular NBS intervention (and investment) not therefore possible. This is the case

especially for wider public goals such as health, well-being or place making, which are priorities for the public sector. For private sector investors, these benefits do not feature in their calculations and a blended approach to financing GI and NBS is therefore likely to be necessary in many cases:

'A banker doesn't really care about the wider public goods – that's why public capital needs to play a role.' (1-6, Private Green Investor)

A useful example in which to explore this issue are SUDS. Here, a private sector interviewee noted that they should not be responsible for financing a scheme in its entirety when others are obtaining benefits from it that go beyond their primary driver for investing, for example in a scheme that delivers amenity and recreation benefits as well reducing the flood risk to properties. In this case, private sector interviewees saw a clear role for the local authority to be part-funding SUDS projects, to cover the provision of benefits to the public realm. Similarly, developers should contribute to related costs on the basis that achieving such benefits can raise land values. This not only applies to the original project finance but ongoing maintenance costs as well. On this point, a local authority interviewee noted that given the multiple beneficiaries of existing GI and NBS schemes, a wider range of stakeholders should be involved in supporting their management and maintenance.

These points highlight the importance of partnership building to develop co-financing models and jointly deliver GI and NBS measures in practice. A particular approach tested within the IGNITION project was the co-investment funding stream for SUDS, which focused on sites that are at particular risk from surface water and sewer flooding. Bringing together different stakeholders to the table, including the Environment Agency, utility companies and local authorities, was seen as a major step towards developing future blended finance possibilities:

'[co-investment in SUDS] helped my highways and flood colleagues to build relationships with United Utilities. And I think going forward, there will definitely be some joint investment in SUDS.' (2-3,Local Government)

Although the need for partnerships to progress GI and NBS schemes (and related business model development) was generally supported, there were different perspectives on where the driving force should come from to stimulate this activity, and who should be engaged. Ultimately, this will depend on the type of intervention. For example, property developers often work with consultants and thought that they should be pushing harder for GI and NBS to be part of development schemes. In the context of investment funds, one interviewee pointed to the central role of asset managers who rate potential investments prior to their adoption. If they have the awareness of and are amenable to GI and NBS schemes, this would impact investment recommendations. Building on this point, one interviewee noted that:

'…the investment side is not a problem, the money is out there. We need to get better at linking up the investment world with the people who exist in the nature based solutions world.' (2-4, Property developer)

There were repeated calls for local authorities, and other public beneficiaries such as schools and hospitals, to take a leading role. This is in part due to acknowledgement of the wide public benefits attached to GI and NBS, and because activity in the public sector can stimulate supply chains and therefore generate greater private sector involvement. It also links back to the risk perceptions outlined previously:

'At the current time, it will require local government to really drive that agenda. ... It [GI and NBS] benefits the population as a whole, broadly. And the level of risk that commercial partners would want to take wouldn't be sizable enough to deliver what you need to for the population as a whole. So I think it's still a case of, you're going to need local government to drive these things.' (2-5, Local Government)

However, this report has already highlighted the barriers faced by local authorities, particularly around funding challenges and staff capacity. This is where projects such as IGNITION can make an important contribution, as they provide temporary resources and support to drive new ideas and relationships. Going forward, there will be a need to identify knowledgeable intermediaries that can advance GI and NBS schemes and draw in capacity and resources from multiple organisations.

4) Progressing demonstration projects and practical case studies

One of the barriers to building investor confidence is gaps in evidencing the performance, benefits and financial viability of GI and NBS projects, in addition to a lack of practical case studies. Interviewees emphasised that demonstration projects should have clear relevance to practice:

'I think that any demonstration project will be valuable along as it is a proper commercial project and not sort of put together to make work and not replicable. It needs to be a 'real' project and it needs to be a proper commercial project not just someone agreeing to put the funds in because you need the demonstration project to work.' (1-11, Green Investor)

For demonstration projects to respond to commercial realities, they should also deliver replicable data that could guide and streamline future projects. While the benefits of GI and NBS are proven in principle, this has not yet translated down to technical specifications and standards, which could be used to make valuations and ensure interventions are fit for purpose. As stated by one interviewee:

'What the industry is really missing is basically a set of technical standards for nature based solutions like SUDS, that you can say, look, by putting in this size, in this area of this size, we're expecting it to deliver this amount, you know, remove this amount of water from the system in say, a one in 30 year flooding event.' (2-9, Financial advisor)

Such standards would help to address current concerns around a lack of guaranteed performance, and consequently offset perceived financial risk. Here, the IGNITION Living Lab on the Salford University campus was identified as a useful contribution to the development of investor confidence. There was an expectation that the Living Lab could provide quantified data that makes a direct link between NBS interventions and the resulting benefits, and provides technical reassurance. It was also seen as a model that could potentially demonstrate climate resilience of NBS infrastructure:

'So I think I again, through the Living Lab, those sorts of studies would be able to reassure our engineers that X number of cubic meters of water could be taken by this size swale or whatever. They would want to know that for their own reassurance.' (2-8, Local Government)

'We want to, if we can, look at the climate resilience of some of the infrastructure we are putting in place. If the Living Lab can help us in that regard, that would be great. I'd like to do it robustly and rigorously if we can, in those elements of measurement.' (2-6, Private consultant)

In addition to providing data on GI and NBS performance, demonstration projects like the Living Lab can help to answer practical and technical questions linked to GI and NBS design, installation, costings and maintenance. As a local authority officer pointed out, these are the details that need to be available and easily accessible for all departments to facilitate a wider rollout of GI and NBS approaches.

Conclusions and recommendations

The IGNITION project was funded by Europe's Urban Innovation Action Programme. It was therefore, by definition, a project working in a challenging, under-researched, and yet important space. One of the key themes for the project was to better understand how to leverage more sources of finance, particularly from the private sector, to support the conservation, enhancement and expansion of urban GI. The engagement of a wide range of stakeholders, through a series of interviews, has indicated that significant barriers remain to building investor confidence to commit to GI and NBS schemes. These relate to issues including the embryonic state of the market for GI and NBS interventions, and associated perceptions of risk linked to engaging in these schemes. There is a sense that risks to

investing in GI and NBS therefore need to be shared amongst different parties. Also linked to the relative novelty of this field, there are gaps in the evidence base and a lack of demonstration projects and case studies. Such data and experience are crucial in guaranteeing long-term performance of GI and NBS interventions, and the lack of such performance data is another factor hampering uptake in practice.

As a result of these barriers, the confidence of investors to commit to GI and NBS projects remains relatively low, according to the metric used within this research, and has not shifted significantly over the duration of the project. Indeed, some stakeholders see options for private sector investment as being limited:

'[Our] view on it, from the very beginning, if we're being brutally honest, was that private investment is never going to work for a public good. And we still hold firm to that belief due to our participation in other projects. We still think that the premise of the idea about private investment is flawed… I still can't see many roads of investment beyond public pressure on the public purse to spend more on green spaces.' (2-8, Local Government)

Nevertheless, bringing private finance into this sector remains an important goal, as philanthropic investments and grant funding cannot be relied upon exclusively to drive forward urban GI and NBS at scale. This report has identified opportunities that can be pursued to help broaden the scope of investors in the GI and NBS sector. These include addressing gaps in the evidence base, building appropriate demonstration projects and strengthening the policy landscape underpinning GI and NBS. However, progressing these require time, investment and capacity building to materialise. Local authorities, who are seen as key players in this space, are hindered by public sector budget cuts and are not able to direct significant funding and capacity to the development and long-term management of such projects.

One factor that could accelerate this agenda is COVID-19, which has increased demand for and attention on urban GI and NBS. However, this particular driver is a double-edged sword as the increased usage of urban GI and NBS has in turn raised pressure on already constrained local authority budgets:

'…[COVID 19] pushed parks and green spaces and green infrastructure on the political agenda, more people are appreciating them, using them, talking about them. The downside is that we probably need to find greater investment than we did previously. Because now the parks and green spaces are more used then potentially there's a greater demand for a greater variety of facilities, and increased maintenance costs because of increased wear and tear.' (Local Government, 2-3)

It is clear that the development of urban GI and NBS schemes at scale to address the climate crisis and other environmental and social needs remains a significant challenge. This work on understanding investment perceptions, barriers and opportunities as part of the wider IGNITION project has highlighted key leverage points for different actors. Realising a future where multiple investors collaborate, in dedicated partnership settings, to finance and deliver GI and NBS interventions will form an important element of transitioning towards greener cities.

Appendix 1: Interview respondents

Round 1: November 2019 – January 2020

Reference	Respondent
1-1	Property Developer / Landowner
1-2	Central Government
1-3	Local Government
1-4	Public Investor (Health Sector)
1-5	Property Developer / Landowner
1-6	Private Investor
1-7	Local Government
1-8	Landowner
1-9	Private Green Investor
1-10	Charitable Investor
1-11	Private Green Investor

Round 2: August 2021 – October 2021

Reference	Respondent
2-1	Central Government
2-2	Property Developer / Landowner
2-3	Local Government
2-4	Property Developer / Landowner
2-5	Local Government
2-6	Private Consultant
2-7	Private Investor
2-8	Local Government
2-9	Financial Advisor
2-10	Public Investor (Environment Sector)

Appendix 2: Interview questions (round one)

Public and private sector investors

Ask interviewee if they are familiar with nature-based solutions. If the answer is 'no' then please read the following text: Nature-based Solutions (NBS) are defined by the International Union for Conservation of Nature (IUCN) as 'actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.' NBS include green infrastructure such as sustainable drainage systems and urban trees.

NB: Take interviewee through the Participant Information Sheet (PIS) (sent in advance of the interview) and obtain verbal consent.

1. Could you describe your job title and role?
2. A. Have you or your organisation invested in nature-based solutions [if no, go to question 2b]? If so, could you give examples of where these investments occurred and the specific investment mechanisms?

   B. What interest do you have, if any, in investing in nature-based solutions, and why?
3. In your opinion, what are the main factors that impact on investor confidence generally (prompts: perceptions of risk and loss; expectations of risk and return; previous experience; knowledge on investment prospects)?
4. What are the main opportunities that can be derived from investing in nature-based solutions [prompts: added worth to investment; corporate social responsibility]
5. In your opinion, what are the main barriers to investment in nature-based solutions? [prompts: return on investment, policy barriers; lack of knowledge on performance]
6. Could I ask you how you would rank your current confidence in investing in nature-based solutions, where 1 is no confidence and 5 is high confidence?
7. [WP 4, 5, 6] What factors would enable you to overcome the barriers to investment in nature-based solutions [please describe all factors that you can think of]? [prompts: policy incentives, consumer pressure, regulation, proof of the cost-benefit, further research]
8. Could you please describe the features of business models that you would like to see in order to persuade you to invest in nature-based solutions?

8. [WP7] To what extent do demonstration projects help when taking decisions about introducing/investing in new technologies such as nature-based solutions? What would you want to see from a demonstration project to persuade you to invest in/use/ promote nature-based solutions?
9. [WP3] Do you want to hear more from the IGNITION project? How best can the IGNITION project communicate with you going forward?

Advisors and intermediary organisations

Ask interviewee if they are familiar with nature-based solutions. If the answer is 'no' then please read the following text: Nature-based Solutions (NBS) are defined by the International Union for Conservation of Nature (IUCN) as 'actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.' NBS include green infrastructure such as sustainable drainage systems and urban trees.

NB: Take interviewee through the PIS form (sent in advance of the interview) and obtain verbal consent.

1. Could you describe your job title and role?
2. Are you aware of any examples of innovative investment in nature-based solutions? Could you please provide examples? [If the answer is yes, provide prompt on what made the investment particularly innovative]
3. In your opinion, what are the main factors that impact on investor confidence generally (prompts: perceptions of risk and loss; expectations of risk and return; previous experience; knowledge on investment prospects)?
4. What are the main opportunities that can be derived from encouraging innovative investing in nature-based solutions, particularly for private sector stakeholders [prompts: added worth to investment; corporate social responsibility]
5. In your opinion, what are the main barriers to investment in nature-based solutions? [prompts: return on investment, policy barriers; lack of knowledge on performance]
6. To what extent are you confident that innovative investment can occur in the nature-based solutions market? [Where 1 is no confidence and 5 is high confidence]?

7. [WP 4, 5, 6] What factors would enable investors to overcome the barriers to investment in nature-based solutions [please describe all factors that you can think of]? [prompts: policy incentives, consumer pressure, regulation, proof of the cost-benefit, further research]
8. Could you please describe what types of business models that you might find effective in this area?
9. [WP7] To what extent do demonstration projects help when taking decisions about introducing/investing in new technologies such as nature-based solutions? What should a demonstration project show in order to increase investor confidence?
10. [WP3] Do you want to hear more from the IGNITION project? How best can the IGNITION project communicate with you going forward?

Appendix 3: Interview questions (round 2)

NB: Take interviewee through the Participant Information Sheet (PIS) (sent in advance of the interview) and obtain verbal consent.

1. In what ways have you been involved with the IGNITION project over the past 2 years?

2. A key area of work for IGNITION has been the development of business models and funding streams for NBS – the most developed is around SuDS, but there are other possibilities around green roofs and parks that have been explored. Are you aware of any of these models? If so, how successful do your think they have been in creating investment pathways?

3. An important issue is how to demonstrate the benefits of NBS to potential investors – many appreciate their benefits, but how do you evaluate them? How have the activities of IGNITION supported this?

4. Risk sharing and the involvement of multiple beneficiaries in NBS projects were flagged up as barriers to investment. Has the work of IGNITION helped to address these challenges?

5. In your last interview, we asked you to rate your level of confidence in the NBS market, on a scale from 1-5 where 1 is no confidence and 5 is high. You gave it a x. How would you rate your confidence today?

6. How has the COVID-19 pandemic changed your understanding of NBS?

7. Have the IGNITION activities helped you build relevant expertise and capacity to deliver NBS? Are there areas that have not been addressed?