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Topic Paper

Green Infrastructure

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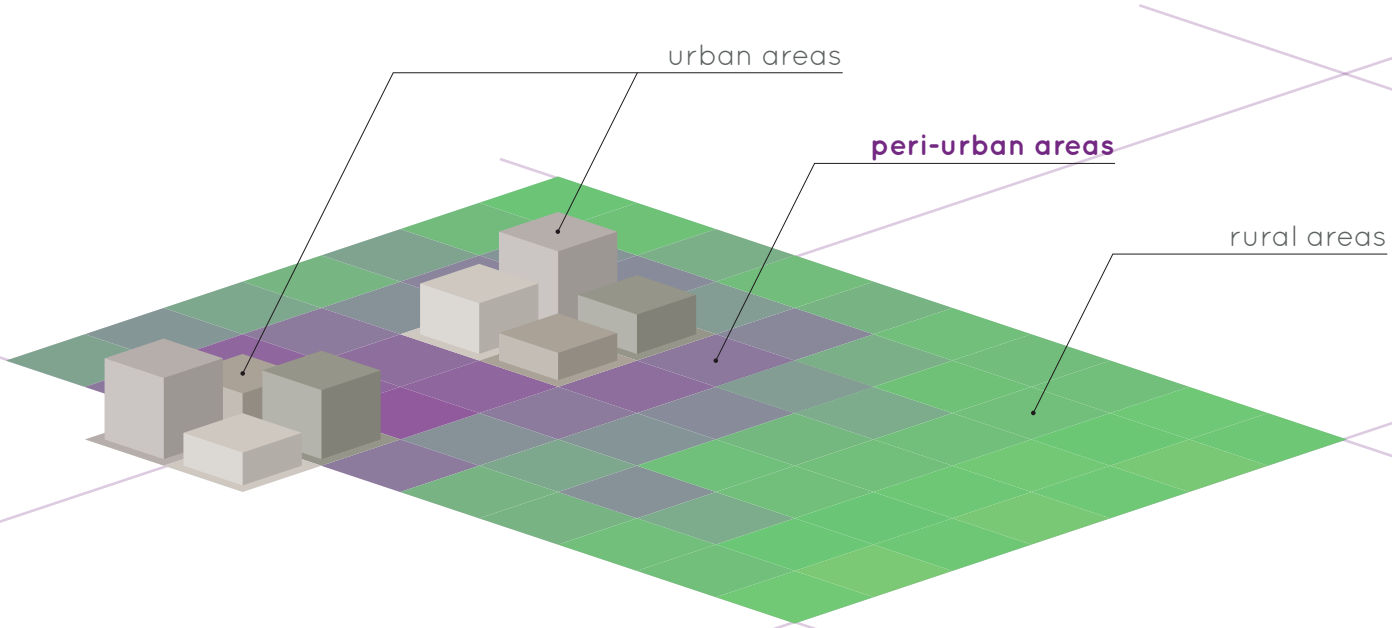
Series Introduction

Each PURPLE Topic Paper aims to raise and explore an issue of importance for peri-urban areas and with specific peri-urban dimensions. They are aimed at a general readership of interested parties but with a particular focus upon policy-makers and politicians.

Around and between cities, especially in densely populated regions, are significant and growing peri-urban areas which are often overlooked and misunderstood. Here there is a high diversity of land uses and important and productive agricultural land and open space. This is often unrecognised or undervalued in current policy development which is too often compartmentalised into urban and rural actions.

The Topic Papers are intended to stimulate debate and activity. They are not intended as polemic and should not, for example, be regarded as "policy position papers". Each is written as a stand-alone document forming part of a complementary series of papers; ideally they will serve as starting points for further investigation and detailed work.



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1. Understanding Peri-Urban

It is important that the reader is offered some sort of explanation of what PURPLE means by peri-urban. It is a concept that has proved extremely difficult to define but relatively straightforward to characterise. In the past PURPLE has tried to capture these characteristics in a number of different ways.

For example:
"Peri-urban areas are themselves a mix of urban and rural. They contain high proportions of agriculture, productive woodland and forest close to Europe's cities as well as high value landscapes and open space.

They are functionally diverse, being on the one hand important for farming, forestry and food production, often within or adjacent to protected landscapes, but they are also the location for major infrastructure, including transport, as well as for water storage, waste disposal facilities, processing and industry.

The crowded nature of these areas means there are conflicting pressures on land use (which also drives up land values) and competition for finite natural resources, together with a high risk of land fragmentation".

Elsewhere we have said that: *"Peri-urban areas are where urban and rural features co-exist. Suburbs, towns and villages together with essential infrastructure (transport, waste, energy etc.) serve large populations. But between and alongside this development, there is another world of open space, forests and woodlands – and [...] important farming and food production. There are growing pressures on peri-urban space and resources (particularly water) which are complex and contradictory."*

"Peri-urban areas are often seen as attractive places to live and work that offer a high quality of life. The upside of this is a dynamism exemplified by economic success and business growth often clustered around innovation centres, airports and other well-connected transport interchanges.

But in some areas, people are moving from city centres to peri-urban areas because of the availability of more desirable housing and lifestyles, and this can create social imbalances. For many peri-urban areas there is a down side of success and growth in terms of rising land values, urban sprawl, increased traffic, unsustainable use of resources and potential negative impacts on the very environment and landscapes which make these territories attractive in the first place".

We accept that there is no universal consensus over the meaning of the term peri-urban, and are fully aware that a set definition which works in all circumstances remains elusive to arrive at. Nevertheless, this hopefully gives a clear idea of PURPLE's sense of what peri-urban is like and about.

2. Peri-urban Green Infrastructure

The concept of Green Infrastructure (GI) is defined in different ways by various bodies and individuals within Europe and beyond. The EU institutions themselves have opted for a catch-all definition: "Green Infrastructure can be broadly defined as a strategically planned network of high quality natural and semi-natural areas (landscapes) with other environmental features, which is designed and managed to deliver a wide range of ecosystem services, play a role in a sustainable landscape in relation to climate change and protect biodiversity in both rural and urban settings".

That is broad indeed. For the purposes of this paper we will accept the above but will add focus by highlighting this helpful addition from Natural England: "Green Infrastructure includes established green spaces and new sites and should thread through and surround the built environment and connect the urban area to its wider rural hinterland. Consequently it needs to be delivered at all spatial scales from sub-regional to local neighbourhood levels, accommodating both accessible natural green spaces within local communities and often much larger sites in the urban fringe and wider countryside".

The addition of the Natural England text brings a tighter peri-urban focus to our debate and also neatly reflects key points of our own thinking to which we will return.

Whilst definitions of GI such as those above are not universally preferred, they do contain the key elements of what we consider is central to GI. For example, GI is "strategically planned", it is not accidental or coincidental and it does not happen without human intervention.

Green Infrastructure can be contrasted to "built infrastructure", it consists of natural and semi-natural areas as opposed to other types of territory and those areas are of above average quality. Those natural areas MAY possess other environmental features. The GI in question is both designed and managed with one or more purposes (again, it is not accidental, incidental or wholly naturally occurring), and the purpose/s in question are related to climate change and/or biodiversity. Such infrastructure is to be found in urban and rural settings – and by extrapolation, (although not stated in the quoted definitions), in peri-urban areas.

Some of the ways in which the above conditions are met with in practice should be regarded as requisite features without which we are not describing GI:

- **Function** - that which the GI does must make a contribution in line with what the definitions describe.
- **Purpose** - reason(s) why it is designed and managed in the way that it is, is in line with what the definitions describe.
- **Intentionality** – there must be clear human intervention to establish the functions to serve the purpose(s).

An example:

GI Flood Alleviation

- **Function**: a bank is maintained to divert water from a local village.
- **Purpose**: this is done so that excess water runs into nearby fields as opposed to towards the village.
- **Intentionality**: the bank is deliberately maintained and the field surface intentionally left permeable.

The above applies to GI in general regardless of location. Of course our particular interest is in peri-urban GI and how that might in some way be specific or distinct from GI in other types of territory.

Sections 4 and 5 of this paper attempt to draw that out in some detail, but by way of a starting point, we might highlight the unique opportunities for GI offered by Peri-urban areas. Here we will find less irreversible development than is typical of more urban settings and more of a blank canvas upon which to draw; we will also find greater space and therefore greater scope. For example, green corridors bring greater benefit when they are more widely connected and are better able to deliver multiple benefits as a result – such a corridor might deliver both recreational and wildlife benefits going beyond what a narrower corridor might bring for instance.

In this context, it might be helpful to think about the nature of peri-urban landscape – that is intrinsically relevant to infrastructure creation and maintenance of course and also has the happy side-effect of making us think at a more macro level.

We might consider peri-urban landscape character to be distinct in a number of different ways:

- It is subject to a faster rate of change than other landscapes.
- It is generally highly prized (appreciated).
- Land prices are typically high.
- It is often "used"/visited by local and non-local residents.

We might also think about how biodiversity is subject to distinct (or extreme degrees of) factors in peri-urban areas given landscape features such as:

- The degree of land fragmentation.
- The extent of multi-functional land use.
- The rate of changes in land use.

The Council of Europe's European Landscape Convention of 2000 makes no overt reference to Green Infrastructure, it does however specifically reference peri-urban and does point out that as far back as 2000 infrastructure development was one factor "accelerating the transformation of landscapes". Much emphasis in peri-urban areas is placed upon landscape protection and in managing landscape transformation. Balancing competing demands and needs is an archetypal characteristic of peri-urban and this applies at least as much in the context of landscape management as in any other. The connection between peri-urban (Green) Infrastructure Development and peri-urban landscape policy and practice should therefore be apparent.

3. Relevant policy contexts

Paradigms

Green Infrastructure is much talked about and championed and its benefits much lauded. It is a broad concept with definitions to match as we have already seen. It follows that it has an applicability to a number of different policy and practice areas within the environmental, economic and social realms[1].

Having a working definition for, (and thinking about the characteristics of), GI is helpful. Using (and developing a shared understanding of) the term serves to give it credibility and set it on an equal footing with phraseology such as "built infrastructure" when used to describe alternative land uses.

That overt recognition of equal importance must start at the policy level. In terms of land use policy for instance, any failure to do so makes existing GI vulnerable and lessens opportunities for future joined-up thinking at the appropriate scale.

We also need to think about where this policy emanates. All too often, GI policy and practice is developed, (and managed), at the European, the national and the municipal levels. This misses territorial levels between the first two and the third – Peri-urban areas being an excellent example of a level at which much could be done but one where policy generation is all too often absent.

1. The EC Staff Working Document of May 2013 identifies 16 discrete policy areas towards which GI might make a contribution.

Policy contexts

For the EU itself, GI has been approached very much from an environmental starting point. For example when perceived as a key step towards the success of the EU 2020 Biodiversity Strategy, where target 2 explicitly calls for GI to be used as a means to maintain and enhance ecosystems and sets out to support work around "biodiversity proofing" and MAES (Mapping and Assessment of Ecosystems and their Services).

In 2013, the EC issued a Communication, "GI - Enhancing Europe's Natural Capital", at the same time chooosing to adopt what it termed an "EU Strategy on *Green Infrastructure*"[2]. Again this emphasised GI as a means to an end – specifically as a way to restore ecosystems, to ensure connectivity of "natural areas" and to enable species to thrive in their natural habitats – all this for the greater aim that "nature keeps on delivering its many benefits to us".

The land use dimension is neither predominant nor ignored - in 2010 an EC report on GI highlighted how a more integrated

approach to spatial planning can be used to "guide the way development happens". The EU's "Building a *Green Infrastructure* for Europe" reiterates the message about how GI can make a contribution in many (EU) policy areas, athough it attempts no sort of territorial analysis beyond saying that GI applies in both rural and urban settings.

2. This is not a single published strategy position but an amalgam of Communication, Staff Working Document, the supported actions under the 2020 Biodiversity Strategy as above and other supporting documentation. The Council, European Parliament, Committee of the Regions (CoR) and EESC have all published reactions to the strategy

4. The nature of Green Infrastructure in peri-urban areas

We have set out on Page page 5 an amalgam working definition of our subject – *Green Infrastructure*. Of course, we need to go beyond definitions to understand both its nature and significance. One way in which we might do this is by being clear about its features.

Identifying characteristics

In additional to what we have already set out as defining features, there are also features which we might expect to see as part of GI. They typify it but we are stopping short of regarding them as preconditions or "defining factors".

- **Connectivity** – being joined-up is good but not essential. Connected, or at least closely located, habitats can be hugely important in term of biodiversity for example to avoid local extinction of species. Peri-urban territory tends by its nature to be fragmented so the issue has a particular relevance here. In some instances you do need connections for a piece of GI to carry out its designed-for function effectively – for example flood alleviation needs to be designed and maintained at the required scale.

- **Multi-functionality** – much GI will serve more than one purpose and function in more than one way in order to do so. But the two things are not synonymous: much multifunctional land use is not related to GI and not all GI has more than one purpose and function. Indeed in some instances attempts to add further functions could detract from the ability to deliver the primary one. We must treat this particular feature with some caution therefore.

- **Breadth and depth of governance** – in common with any subject area where we are looking at multiple interests coming together in some sort of collaborative way, we would expect to see relatively complex governance arrangements in place designed to balance the interests of different actors at different levels. Success in this regard will militate towards maximum win-win success scenarios. Failure may jeopardise an entire operation!

Determining the significance

We want to achieve a deeper understanding of just what GI might mean in a peri-urban context - for example in an attempt to establish the optimal extent of GI in peri-urban areas. We can approach this by focusing on the benefits that GI is able to bring; e.g. its role in improving quality of life through providing benefits of different types can be looked at from a large number of angles, for example: (see next page)

From an environmental perspective a GI resource can help:

1. counterbalance increasing landscape fragmentation.

2. maintain and improve wildlife habitats and ensure wildlife exists outside protected areas, in turn beneficial for pollination (good for crops and food production) and pest control.

3. maintain the valuable services provided by ecosystems such as cleaning air and water, reducing flood risk, improving soil quality, preventing erosion and storing carbon.

4. mitigate effects of climate change, e.g. green roofs and urban tree planting can reduce the urban heat island.

From an economic point of view, it can:

5. boost local economies through regeneration and job creation, whilst potentially also greening the economy.

6. serve to develop or preserve local areas' distinctive features and make them attractive for residents, businesses and tourism.

From a social perspective, it can:

7. improve human health and wellbeing through recreation and by providing appealing landscapes.

8. reduce crime though provision of well-maintained and aesthetic and maintained green spaces.

However, much of the above would also apply to managed, and in some cases unmanaged, countryside and indeed the same benefits are often claimed for interventions which lack any obvious "green "dimension.- far less any clear peri-urban dimension. In short, the benefits often cited can certainly not only be claimed for those areas meeting our GI definition "test" above.

For example, we make no special peri-urban GI case for items 2, 4, 5 6 or 8 above, true and valid as they may all happen to be. We do however claim a particular peri-urban significance for:

- **No. 1** – given that land fragmentation is an issue of particular importance in peri-urban areas.
- **No. 3** – in part where peri-urban GI can fairly be argued to bring a particular broader geographic benefit in terms of air and water quality, reducing flood risk and carbon storage.
- **No. 7** – where there is a particular interplay between urban and peri-urban areas.

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The unique peri-urban contribution

Urban GI is perfectly valid and quite rightly recognised as important. Activity which would pass the definition test for GI also takes place in more rural areas but is less often thought of as GI.

Peri-urban based interventions though have a particular role to make in terms of volume, breadth and scope.

- **Volume** – in that open space is far more readily available than in urban areas;
- **Breadth** – in that there is a greater number of feasible options than elsewhere and;
- **Scope** – insofar as they can deliver benefits that go beyond their own immediate geographic localities.

5. Opportunities and threats for peri-urban Green Infrastructure

There are particular opportunities of broad benefit to be gained from peri-urban GI; at the same time there are challenges which have a particular peri-urban dimension to them.

Strengths and opportunities

- Urban Green Infrastructure options are often spatially restricted. Developing GI in already built upon ground offers limited scope for adaption and can be not a lot more than an exercise in retrofitting – valuable as that might be. Peri-urban areas on the other hand have far greater scope in design terms.

- GI in peri-urban areas might be used as a way of revisiting land use debates in areas of existing protection designations. This might apply for example on land where building is controlled or limited such as "green belts" - a predominantly peri-urban phenomenon.

- Peri-urban areas lend themselves especially well to experimental approaches where GI is built in to the thinking from the earliest possible stage.

- For example we could look to see whether and how the generally accepted benefits of GI can be maximised in territory where there is greater scope for radical land use change than in an already built-upon environment and greater opportunity to plan for GI at an earlier stage.

- It is in peri-urban areas where we might typically find the greatest experience and expertise in balancing competing demands as regards land use.

Risks and threats

- Counter-balancing land fragmentation has already been referenced as a potential benefit of GI. The starting point is often more acute in peri-urban areas as contrasted to others given that the territorial nature of peri-urban areas predisposes it to this factor.

- Peri-urban areas face challenges regarding not only the way in which land is fragmented but also its cost and therefore affordability. In a similar way to multi-functionality being characteristic and of benefit, the scope for multiple possible uses can increase competition over ownership and use and hence financial cost.

- We refer elsewhere in this paper to a lack of policy interventions aimed at levels between the very local and the regional and upwards. Should this situation persist we risk missing the chance to do much valuable work.

- By failing to realise the distinctiveness of GI in different types of territory and adopting an inflexible one size fits all policy framework we risk missing significant opportunities.

6. Developing an agenda for peri-urban Green Infrastructure

An agenda for peri-urban GI should be built upon a clear understanding of its (GI's) defined meaning, its character and nature, its unique potential and the particular challenges it faces in the ways set out in various other sections of this paper.

Any agenda will need to be broad enough to encompass considerations of policy and practice across a range of topics but especially with regard to environmental matters and land use planning. That reflects the two overarching concerns around peri-urban territory in general. At the same time any such agenda will need to acknowledge and take account of all the environmental, economic and social dimensions which apply as per section 4 of this paper.

The environmental dimension should be to the fore; we will want to be sure not to lose the central focus on biodiversity, ecosystems, connected habitats etc and upon how using the creation, maintenance and protection of peri-urban GI can be a key driver towards environmental ends.

We have already pointed out the importance of GI in general being recognised as a concept and approach with equal validity (and hence status) as others. It is vital that GI is thought about, and acted upon, in the same way as built infrastructure – that it is planned and legislated for in the same (or better!) ways and that it is recognised as an option with equal merit and importance to alternatives. It should not be consigned to being an option only for "left-overs", or as some sort of "nice to have" afterthought once the important things have been dealt with!

That applies to GI regardless of its location of course but our point is that a key building block for achieving that recognition, and for developing an agenda for peri-urban GI more specifically, should be open recognition of the unique potential for peri-urban space to act as an experimental ground for GI interventions. PURPLE is happy to play a lead role in that process but calls for support from other interested stakeholders.

Peri-urban GI can lead the way compared to both urban (where inherent restrictions apply to a far greater extent) and to rural areas where GI is less of an issue in a setting where "green" predominates anyway. That role needs to be recognised, acknowledged and incentivised – and all three dimensions should form part of any peri-urban GI agenda.

PURPLE will continue to urge policy makers at all levels to review their existing evidence and policies in order to respond in a more agile manner to the sorts of opportunities and benefits that peri-urban GI has to offer. Without this conscious effort, properly integrated, fully functioning GI cannot be achieved. Acknowledgment of that last fact will also need to be clearly incorportated in any agenda we succeed in developing.

7. Questions for policy-makers

What can policy-makers and regulators do to make sure that the key contribution of peri-urban GI is recognised, understood and maximised?

- We have referred to the need to make GI more central to our thinking and to give it equal status with other approaches. How can policy-makers most effectively help make this happen?

- One particular approach might be to shape a system where regional and local actors are not so much required to consider on a case by case basis whether a GI intervention is appropriate and to explain that; but rather to demonstrate how and why they have considered and rejected somehow incorporating GI. Can policy shift the default setting here?

- Can policy be used to help accurately determine the optimum extent of peri-urban GI?

- In this paper we have cited a definition of GI which explicitly references the role GI might play in connecting rural and urban areas. What can policy-makers do to help increase the take-up of this key dimension in the thinking and approach of others?

- How can peri-urban GI be incentivized? Given what we know about the nature of peri-urban places as opposed to other types of territory, are specific measures or mixes of measures called for?

PURPLE sees specific challenges for policy-makers in this area and is keen to work with them to explore:

- How they can best ensure that planning for Green Infrastructure is planned, built and maintained as with any other form of infrastructure required by new developments.

- How best to guarantee the interests of peri-urban areas when implementing GI initiatives of broader geographical value.

- How we can ensure there is some sort of equity between where and how investments are made and where and how benefits are enjoyed.

- How we can best communicate the multi-dimensional benefits of GI (environmental, economic and social).

- How to do that whilst at the same time not losing sight of the particular nature and purpose of GI and damaging its distinctive identity.

- How best to develop a sense of "shared ownership" of GI initiatives designed and developed as part of local "place shaping".

- How best to ensure that GI is given equal status with other infrastructure when decisions are made about competing land uses.

- How to ensure that GI, once created, is protected and not lost to subsequent development.

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8. PURPLE offer and next steps

PURPLE wants to continue to advance the case for peri-urban Green Infrastructure. Winning recognition for its true nature and value; for the unique opportunities it offers and for the importance of ensuring that more is done to support delivery of the benefits it can undoubtedly bring about.

We will want both to ensure that we safeguard and improve what we already have and add to the stock of peri-urban green infrastructure in the best ways possible.

PURPLE is particularly interested to develop a more robust evidence base for the exponential potential of peri-urban Green Infrastructure and hopes to find a mechanism for developing that piece of work in parallel with an attempt to identify the optimum amount of Green Infrastructure in a peri-urban setting.

In order to achieve both the general and more specific aim outlined above, we intend to:

- Collect, analyse and share good and innovative practice in ways that are of genuine use to others.
- Collaborate in projects and other pieces of joint trans-regional and trans-national work that are designed to help us achieve our ends and in particular to increase the capacity of peri-urban regions themselves to design high-quality Green Infrastructure.
- Continue to call for, and make a case for, greater recognition of the value of peri-urban Green Infrastructure.
- Seek to influence policy-making and practice in various fields so that it is better able to support and incentivise an increase in peri-urban GI initiatives.
- Stimulate work at different levels which helps actors beyond the peri-urban to understand the benefits of peri-urban GI for them as well as its instigators.

PURPLE is always delighted to hear from anyone who shares our interest in this subject and is keen to explore ways in which we might collaborate for mutual benefit.

For further details of PURPLE's work and to keep up to date with our progress towards developing an agenda for peri-urban governance:

See the PURPLE website

www.purple-eu.org/topicpapers