

Taking a collaborative approach in the water sector: A review of the Metropolitan Glasgow Strategic Drainage Partnership



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Abbreviations

BGI - Blue Green Infrastructure

BG - Blue Green

BGG - Blue Green Grey

CaLL LPD - Clyde and Loch Lomond Local Plan District

CC - Climate Change

CG - Clyde Gateway

CGIWP - Clyde Gateway Integrated Water Plan

CM - Clyde Mission

CP - Clydeplan

CRC - Climate Ready Clyde

CSO - Combined Sewer Overflow

EDC - East Dunbartonshire Council

FAS - Flood Alleviation Scheme

FRM - Flood Risk Management

FRMC - Flood Risk Management Community

FRML - Flood Risk Management Lead

GCC - Glasgow City Council

GCVGN - Glasgow and Clyde Valley Green Network

GI - Green Infrastructure

GSDP - Glasgow Strategic Drainage Plan

CSGN - Central Scotland Green Network

LA - Local Authority

MGSDP - Metropolitan Glasgow Strategic Drainage Partnership

MLP - Multi-Level Perspective

NBS - Nature Based Solutions

NLC - North Lanarkshire Council

NPF - National Planning Framework

NR - Network Rail

NS - Nature Scot

OECD - The Organisation for Economic Co-operation and Development

RC - Renfrewshire Council

SC - Scottish Canals

SE - Scottish Executive

SF - Scottish Forestry

Sfs4 - Sewers for Scotland 4

SG - Steering Group

SLC - South Lanarkshire Council

SUDS - Sustainable Drainage Systems

SW - Scottish Water

SWMP - Surface Water Management Plan

TG - Technical Group

TS - Transport Scotland

Contents

Executive Summary	1
1.0 Introduction	3
2.0 Literature Review	4
2.1 Collaborative Partnerships Review	4
2.2 Collaborative Partnerships in Urban Water Management	5
2.3 The MGSDP Review	5
2.4 Initial Findings and Discussion	5
3.0 Stakeholder Consultation - Interviews, Workshops & Surveys	6
3.1 Effective Governance	6
3.2 Efficiency in Governance	7
3.3 Engaging and Trusted Governance	7
3.4 Conclusion	7
4.0 MGSDP Case Studies	7
4.1 Drumchapel - Multi-partner Cross-boundary Multi-phase	8
4.2 Smart Canal – Cross-sector Complex Multiple-funding Innovative Solution	8
4.3 Sandyhills Park – Green Space Enhancement Deculverting Shared Funding	9
5.0 Discussion & Recommendations	10
5.1 Discussion	10
5.2 Key Lessons Learnt	10
5.3 Recommendations	12
6.0 References	14

Executive Summary

Research Questions

The presented research sought to answer three key questions regarding the Metropolitan Glasgow Strategic Drainage Partnership (MGSDP):

1. What are the key findings in academic and grey literature regarding collaborative, cross-sectoral / organisational partnership management in general, and within the water sector in particular?
2. What are the key lessons learnt from the MGSDP to date?
3. What can be learnt from the MGSDP for the management of flood risk and other aspects of water management in Scotland?

Background

The MGSDP is a non-statutory, voluntary, partnership between public bodies involved in managing surface water, water quality, flood risk, investment planning and economic development. The MGSDP's area is delineated based on the wastewater treatment works catchments rather than local government boundaries.

The partnership working that became the MGSDP began following severe flooding in July 2002 in the East End of Glasgow that caused ~ £100m of damage. The MGSDP has implemented a number of projects across the metropolitan Glasgow area and has gained knowledge and experience in project delivery, strategic investment planning and partnership working.

This review was commissioned to gain a better understanding of the partnership model to provide recommendations that will inform partnership working elsewhere in Scotland – particularly cities and towns where increased rainfall, sea level rise and more frequent river flooding have heightened the risks faced by communities.

Research Undertaken

A three-staged study was undertaken to identify lessons learnt: a literature review focussed primarily on collaborative governance approaches and the evolution of the MGSDP collaborative approach; interviews and workshops with key MGSDP partners and flood risk management community; and a workshop followed by the analysis of the findings.

The literature highlighted the importance of the 12 principles defined by the Organisation for Economic Co-operation and Development (OECD) for better water governance, and work which identified the key

attributes of multi-stakeholder water governance. The two frameworks were used to focus the analysis of the MGSDP and benchmark its performance against similar organisations.

In this study a total of 36 'face to face' semi-structured interviews were undertaken with twenty-one of the MGSDP partners and fifteen flood risk management leads (FRMLs) from eight Local Authorities. Members of the flood risk management community (FRMC) were also invited to participate via an online survey based on their knowledge and experience with the MGSDP and / or flood risk management in Scotland.

The interviews and survey questions had three key themes that were based on the three OECD principles of good and adaptive water governance. A fourth theme encouraged respondents to reflect and consider implications for partnerships going forward – for both the MGSDP and new drainage related partnerships. Each theme had several nudge questions to encourage and guide the dialogue if needed.

Key Findings

The MGSDP has successfully embedded a collaborative culture, working across silos to overcome fragmented regulatory, funding, and institutional barriers to modernise and transform drainage infrastructure. Nonetheless, challenges remain regarding how the MGSDP engages with the public, and fragmented decision making continues to be an obstacle to more effective partnership working.

Similar water / development related partnerships in the future should focus on developing strong relationships to address clearly defined shared objectives. To assist progress with collaborative partnerships in the water sector, consideration should also be given to the fragmented regulatory framework, funding cycles, and institutional barriers.

Key lessons learnt were considered within the context of both MGSDP's future and the development of new partnerships elsewhere in Scotland based on the three OECD principles of good and adaptive water governance:

1. Effectiveness - A coordinator is required to effectively establish common goals which underpin the partnership working process and sustain strong collaborative groups.
2. Efficiency - Internal and external knowledge and capacity building is crucial to avoid narrow-focussed partnerships and deliver broad agendas. It was also considered that overlapping responsibilities and misaligned funding cycles have been barriers to progress.

3. Trust and Engagement - Early engagement of all stakeholders involved in the process (internal and external) is essential. Being open, honest and sharing information builds trust and helps overcome barriers such as lack of equity within a partnership. Establishing trust leads to enhanced problem solving and a willingness to take risks.

Recommendations

A key output from the project is a set of practical recommendations for the MGSDP, policy makers and the wider flood risk management community.

For the MGSDP the focus was primarily on public engagement and steps which could be taken to facilitate good partnership working. It was concluded that a public facing vision is required which all partners agree upon, and that the public should have input into the design of individual projects to ensure community needs are met and multiple benefits are maximised.

It was also considered important that some of the lessons learnt within the MGSDP are used to establish best practice in project delivery within a Scottish policy context.

For the wider flood risk management community, it was considered important to note that new partnerships should take steps to ensure larger partners do not dominate, and that “silo thinking” does not hold back progress. It was concluded, however, that it may take time to establish a partnership, to agree a common aim and which has the energy to sustain itself.

In terms of recommendations for the Scottish Government, it was noted that the fragmented statutory framework with regard to flood risk management in Scotland can pose a challenge. It was also concluded that there is a need to establish realistic national guidelines and standards for inspection and long-term management of interventions. Linked to this, community stewardship and citizen science initiatives were considered to have significant untapped potential in Scotland.

1.0 Introduction

The MGSDP is a non-statutory partnership between public bodies involved in managing surface water, water quality, flood risk, investment planning and economic delivery. The MGSDP area covers the catchments of the four main Glasgow wastewater treatment works (Dalmarnock, Dalmuir, Daldowie and Shieldhall), plus the Paisley and Erskine wastewater treatment works (WwTW) catchments (Figure 1).

The partnership working that became the MGSDP began with the Glasgow Strategic Drainage Plan (GSDP) and was guided by a Steering Group (Glasgow City Council, Scottish Environment Protection Agency (SEPA), Scottish Water (SW) and Scottish Enterprise) to investigate the severe July 2002 flooding in the East End of Glasgow that caused approximately £100M damage (Ellis, 2009, Ravetz and Connelly, 2018). It was recognised that an integrated and holistic strategy to master planning was required to meet the needs of all stakeholders (Tufail et al., 2004, Cashman, 2007). This is key as the responsibilities for stormwater management in Scotland are divided between several parties, with conflicting statutory duties and unaligned funding streams making collaboration difficult (Aukerman, 2011 and McKay, 2019).

The Partnership that spearheaded development of the GSDP later became the MGSDP by expanding to include a number of adjacent local authorities. In 2008, it was recognised that projects with the size, complexity and cost

of the GSDP and the Clyde Gateway Integrated Water Plan justified an independent technical review to scrutinise management and delivery. A key recommendation was that a Project Management Office (PMO) be established to provide top level coordination (Jefferies et al., 2009) – Figure 2 shows the MGSDP management structure with the PMO in place.

The Partnership renewed their vision in 2012 to address the needs of Metropolitan Glasgow for the next 50 years (The MGSDP, 2014). The vision being “*transform how the city region thinks about and manages rainfall to end uncontrolled flooding and improve water quality*” (The MGSDP, 2016). This provided a strategic focus to realise the vision, and initial key objectives were rationalised to five clear overarching goals supported by eight clear guiding principles (Ravetz & Connelly, 2018, Allan et al., 2016). The vision, objectives and guiding principles are available on the MGSDP website.

As the MGSDP enters its next phase where it must respond to the climate and biodiversity emergencies, now is an ideal time to take stock of the gains made, study its impact, and fully understand how the knowledge gained can be used to address challenges other cities in Scotland face. The Fourth National Planning Framework (NPF4) (Scottish Government, 2021) makes clear that in the coming decade the scientific, political and public aspirations to mitigate climate change impacts will result in increased demand for investment in adaptive approaches and collaborative working (Hiller et al., 2019). Indeed, by

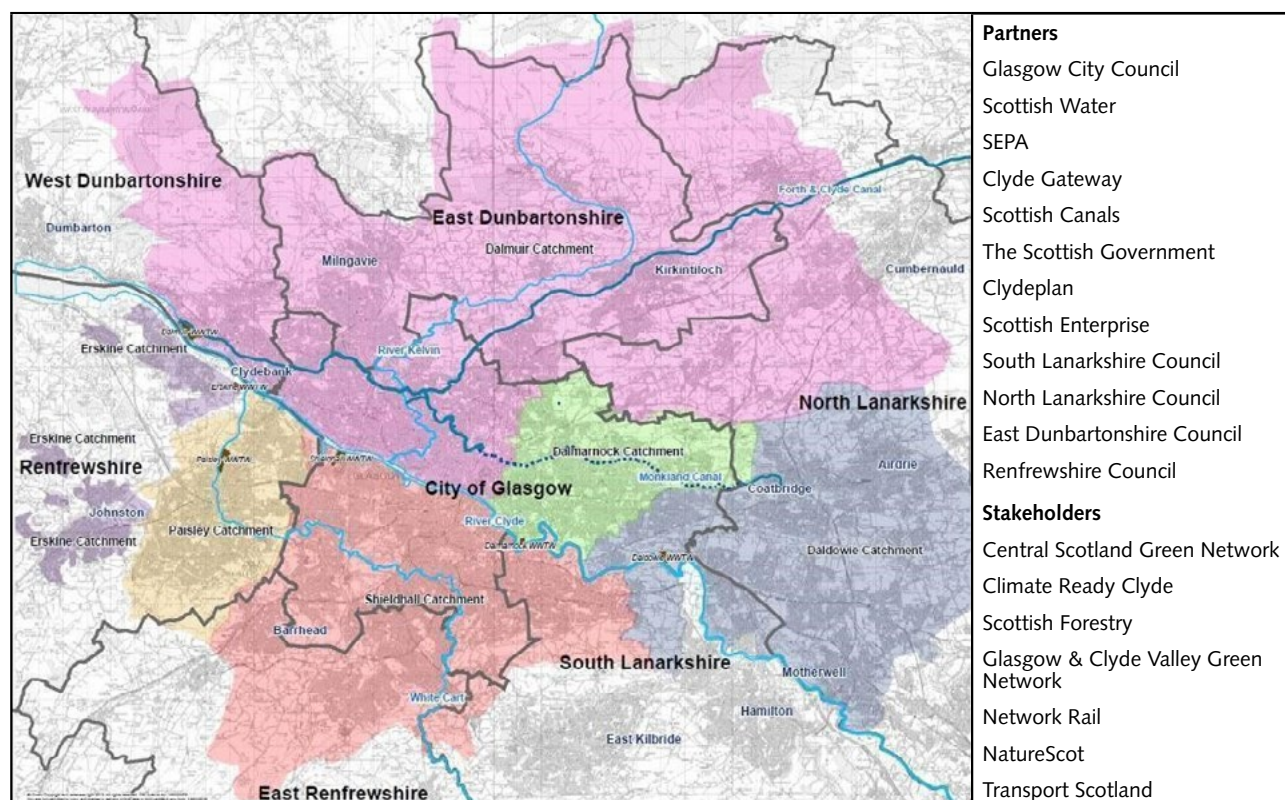


Figure 1 - The MGSDP area of operation, partners & stakeholders (Shaded areas represent the catchments of wastewater treatment works (www.mgsdp.org))

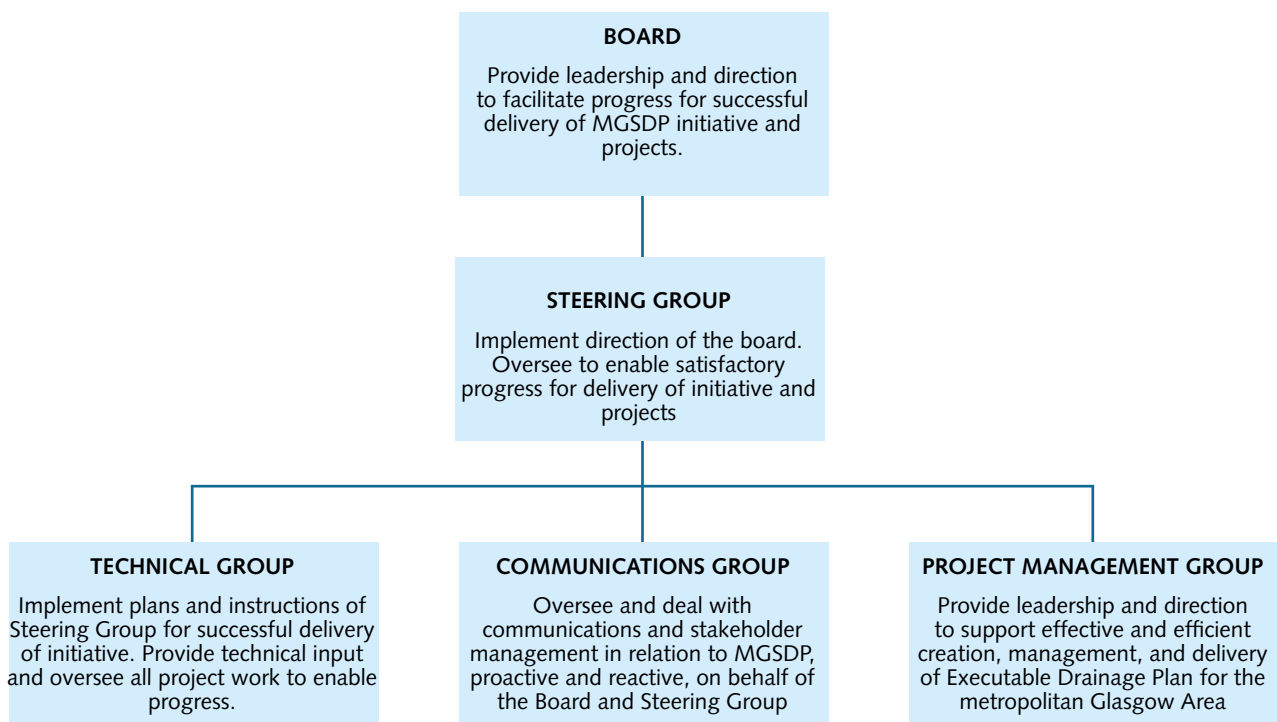


Figure 2 - MGSDP management structure (adapted from MGSDP 2009).

considering the Learning and Action Alliance Approach (O'Donnell et al, 2020) for the North Glasgow Integrated Water Management System review (as part of NPF4) it is important that the need for collaborative governance is understood (Allan et al., 2016).

To support the MGSDP and inform policy developments, this report seeks to review how it has operated, and understand what lessons can be learnt. To deliver this a literature review was undertaken (Section 2), consultation data was gathered via interviews, surveys and workshops (Section 3), case studies were developed (Section 4) and recommendations made (Section 5).

2.0 Literature Review

This section aims to provide an overview of academic and grey literature on approaches to collaborative cross-sectoral / institutional partnership approaches in the public policy sector. It considered experiences within and outwith the water sector. The MGSDP is reviewed within this context and compared to similar partnerships elsewhere in the UK and further afield. Literature review methodology and supplementary information can be found in Annexes 1.1-1.4.

2.1 Collaborative Partnerships Review

Partnership approaches and arrangements in the public sector are shaped by the overarching governance structure and the challenges the partnership faces. Various theories

exist that explain governance processes (van Montfort et al., 2014, Romano & Akhmouch, 2019). Good governance is key, particularly for cross-sectoral partnerships, as it provides a framework to ensure fair use of resources in decision making and means the organisation remains accountable to stakeholders.

A range of forms of governance can be found in literature, ranging from traditional governance that involves state-centric and top-down approaches, to new approaches that include society-centric, market based multi-level and multi-actor arrangements. There is now broad agreement, however, that poor governance or the lack of governance capacity is at the core of many policy failures (Howlett et al., 2015). Within this context, the OECD developed 3 key dimensions (below) for water governance supported by 12 principles (see Annex 1.2, Figure 1 for more information) as a means to mitigate these risks in a sustainable, integrated and inclusive way for stakeholders involved in water policy design and implementation (Lockwood et al., 2010, OECD 2015, Akhmouch and Correia, 2016):

1. Effectiveness - clear roles and responsibilities; manage water at appropriate scales within integrated basin systems; cross-sectoral coordination between water and environment policies; capacity of responsible authorities for water challenges and required competencies.
2. Efficiency - share water and water related data and information; governance arrangements should mobilise financing and resources; regulatory frameworks enforced in pursuit of the public interest; innovative water governance arrangements.

3. Trust and engagement - integrity and transparency across water policies; promote stakeholder engagement; water governance frameworks that manage trade-offs across water users, rural and urban areas and generations; monitoring and evaluation of water policy and governance.

In terms of multi-stakeholder water governance, researchers (Djalante 2012, OECD 2018, Avello 2019, Bayrak et al., 2020) have identified the following key attributes for adaptive water systems:

1. Coordination and collaboration – pooling knowledge from multiple actors (Couper et al., 2019).
2. Polycentric – several independent but coexisting decision-making centres (Ostrom, 2010).
3. Participation – equitable and inclusive participation of stakeholders (Jimenez et al., 2020).
4. Deliberation – integrating different forms and sources of knowledge (Lebel et al., 2006).
5. Equity and inclusiveness – trust building and shared understanding (Collins et al., 2020).
6. Accountability and transparency – explaining solutions and decisions (Lebel et al., 2006).
7. Adaptive capacity – ability to adapt increases capacity to tackle changes (Lebel et al., 2006).

2.2 Collaborative Partnerships in Urban Water Management

Selected partnerships from the UK and internationally were reviewed against the attributes described in Section 2.1. All partnerships reviewed promoted social learning, multi-stakeholder participation and knowledge co-design. They were found to fall into one of four groupings:

1. Learning and Action Alliances in England (Ashley et al., 2012, Ensor and Harvey 2015, O'Donnell et al., 2020a) and mainland Europe (Pahl-Wostl et al., 2013);
2. Polycentric Governance in e.g., Germany (Zingraff-Hamed et al., 2019);
3. Public-private partnerships in Sweden (Martin et al., 2018 & TEN Group, 2010), Germany (Dushkova and Haase, 2020), Thailand (ADPC'S NEWS, 2017) and England (Wild, 2017); and,
4. Governance experimentation in e.g., Australia (Bos and Brown, 2012).

This review also sought to identify factors which led to successful partnership arrangements. In each case, success was judged using indicators such as solutions delivered, effectiveness of partnerships and operational sustainability. It was concluded that success could be seen as being

due to the effective implementation of activities in broad alignment to the OECD (2015) principles.

2.3 The MGSDP Review

The literature review also considered the MGSDP from the perspective of published reports and papers. It was found that the partnership is well regarded, has evolved considerably since its inception and is used widely as an example of a successful multi-agency approach (McDonald & Jones, 2006 and Ellis 2009). Ravetz and Connelly (2018) reviewed water governance and identified the MGSDP as one of two case studies exemplified as best practice. McKay (2019) describes lessons learnt delivering surface water management plans (SWMPs) in Glasgow and concluded that the MGSDP had avoided duplication of effort, pooled expertise and shared costs for projects to deliver integrated solutions and multiple benefits. The United Nations Global Assessment Report on Disaster Risk Reduction (UNISDR, 2015) highlighted the MGSDP's White Cart flood alleviation scheme as one which had focussed on social vulnerability as well as flood hazard. García-Lamarca and Gray (2020), however, discuss urban environmental justice and the challenges with regeneration schemes, such as areas associated with the Smart Canal project in Glasgow, that predominantly create new homes for higher income residents.

In terms of the Scottish policy context, The Flood Risk Management (FRM) (Scotland) Act 2009 (Scottish Government, 2019) identified the MGSDP as an effective partnership, and it received National Planning Framework 3 status (Scottish Government, 2015). Indeed, Clydeplan (2017) fully embeds the MGSDP objectives and guiding principles into its vision and other partnerships have been inspired by its successes (e.g., Edinburgh and Lothians Strategic Drainage Partnership (Waldron, 2020)).

2.4 Initial Findings and Discussion

The review confirmed that partnership working with good governance arrangements is key to delivering complex projects efficiently. Many examples of public partnerships were found in the literature, but each has evolved to reflect their unique / local circumstances – not least the funding and policy context. The review has highlighted that the MGSDP evolved over time and is a hybrid of governance approaches found in literature – and as more flexibility was required has moved towards an adaptive governance arrangement similar to Learning and Action Alliances. Table 1 uses the attributes of good and adaptive governance (Section 2.1) to compare the MGSDP to other partnerships. Although the comparison is high-level in nature, it suggests that the MGSDP is weaker with regard

Table 1 - The MGSDP compared to partnerships using the good governance attributes (OECD 2015).

	Netherlands	Newcastle	Sydney	Sweden	MGSDP
Coordination and collaboration	x	x	x	?	x
Polycentric	x	x			x
Participation	x	x	x	x	
Deliberation	x	x	x	x	
Equity and inclusiveness	x	x	x	x	x
Accountability and transparency	x	x	x	x	x
Adaptive capacity	x	x	x	x	x

to engaging stakeholder communities (this links to the OECD Trust and engagement driver).

Engaging with communities is key to the success of partnerships identified in the literature, and it appears the MGSDP has yet to fully realise this potential. Although participation takes time, it ensures acceptance of interventions (García-Lamarca and Neil, 2020) by encouraging co-designed innovative solutions (Zingraff-Hamed et al., 2019), and is key to a just urban governance (Olsson et al., 2020). Section 3 of this report will consider this issue further.

3.0 Stakeholder Consultation - Interviews, Workshops & Surveys

In this study 36 semi-structured interviews were undertaken, where the interviewees comprised twenty-one of the MGSDP key partners and fifteen FRMLs from eight Local Authorities. In addition, an online survey was sent to 31 members of the FRMC with a 68% response rate. To triangulate and validate findings, workshops were held where research outcomes and preliminary recommendations were presented. Data from the interviews, online survey and workshops were analysed together using NVivo software, by applying thematic coding and categorisation for emerging themes. Theme analysis outcomes were then grouped based on the attributes of good and adaptive water governance (Section 2.1). The consultation methodology and supplementary information can be found in Annexes 2.1-2.3.

3.1 Effective Governance

The MGSDP's effectiveness was evidenced with respondents identifying clear roles and responsibilities. The ability to manage water at appropriate scales across catchments was noted, and cross-sectoral coordination and the capacity of responsible authorities to meet water related challenges was evident. The governance

arrangements present in the MGSDP illustrates the importance of coordination of the partnership to overcome silo thinking. The PMO's primary function was noted as being facilitation, collaboration, making connections, problem solving and administration to deliver drainage master plans. As evidenced in governance literature, this type of effective coordination is key (Couper et al., 2019, Collins et al., 2020). The partnership provides a good mix of professional capabilities at all levels with a focus on collectively developing and progressing projects – this is key as diversity within a team can enable problem solving (Horwitz, 2005)

"The reason for success is the continuity, relationship and trust between members and access into Partner organisations with commitment to secure better outcomes." - MGSDP Partner

"Working in multi-disciplinary teams with the MGSDP helped us deliver design-based solutions that combine hydrology, engineering, ecology, and landscape expertise." - FRMC Respondent

To sustain the capacity for future water challenges to be met, the importance of refreshing the long term vision for MGSDP was emphasised. Maintaining the capacity and flexibility of the partnership was also considered important, with an expanded membership encouraged to engage more sectors to help foster novel innovations and align with other objectives such as the climate emergency and the wellbeing agenda. The main areas where the MGSDP could improve was communication regarding the localised impacts of projects - demonstrating actual costs and multi-benefits realised will help foster and fast-track partnership working in other areas of Scotland. This visibility, and wider community engagement, will help deliver economic and quality of life benefits (Arnstein, 1969, Mulholland et al., 2020). Behaviours around risk taking, related to a blame culture and fragmented statutory responsibilities, are still prevalent and a barrier to overcome.

"... we need to get the right people with commitment and other groups that can add value and contribute to new challenges. We can't resolve flooding with just flooding practitioners anymore – climate / biodiversity crises present new issues." - Scottish Government Agency

3.2 Efficiency in Governance

Efficiency was evidenced through MDSGP's approach to sharing water related data and using clear governance arrangements to mobilise financing and resources. The key factor in collaborative partnerships was shared resources, expertise, knowledge, and funding to deliver a shared vision with leadership, coordination and high-level support. The added value of the partnership approach was identified at all levels aided by joint investment mechanisms to deliver integrated, cross-sectoral and cross-boundary solutions that provide multiple benefits and more value for money. This was achieved through pooling resources and funding to deliver multiple benefits and sharing information to solve issues and implement projects - integrating different forms and sources of knowledge can be a key benefit of good governance (Lebel et al., 2006). Influencing national and local policy and replication of the collaborative approach are key achievements of the partnership and were also considered added value. However, aligning budgets and / or funding cycles between statutory bodies was unanimously considered the most difficult barrier to overcome when creating similar partnerships as this did not allow flexibility nor lend itself to a strategic, long-term approach.

Nonetheless, the MGSDP partners were clear that if the partnership did not exist they would still be working in silos with less joined up strategies at catchment level. It was felt that although progress had been slow at times; without the MGSDP projects would have cost more, have fewer multiple benefits and take longer to deliver. Some argued that there would still be uncontrolled flooding with missed opportunities such as the Smart Canal and establishment of Clyde Gateway URC. Glasgow's Smart Canal was cited as a game changing capacity attained by the partnership and is considered as proof of the MGSDP's ability to adapt governance arrangements to meet future challenges.

"...the MGSDP is leading the way in Scotland regarding collaborative cross-institutional partnerships and climate resilience." - FRMC

Without the MGSDP the "scale of projects would be smaller; a piecemeal approach to drainage leading to lost opportunities for communities and biodiversity." and "silo approach, more acute funding challenges, lack of common purpose, and experience to drive it." - Multiple Sources

3.3 Engaging and Trusted Governance

Trust and engagement were demonstrated through the MDSGP's integrity and transparency across Partner organisations and water policies. The requirement to promote stakeholder engagement and water governance frameworks that manage trade-offs across water users and

catchments are evident. Communication was considered crucial to developing trust and tackling challenges, and moving away from a blame culture was required (Collins et al., 2020). Patience and the willingness to accept that it can take time to build up trust and develop an inclusive culture was considered the key lesson learnt.

"...stepping outside the silo and build long-term relationships by understanding the challenges and priorities of your partner organisations to develop a long-term strategy" - FRMC

Respondents felt trust is developed by ensuring early engagement in the process and maintaining focus on the agenda with invested and committed partners, including high level decision makers. There were concerns related to the power imbalance within the partnership, the poor dialogue between the Technical Group and the Board, with some partners feeling the partnership was Glasgow-centric. There was also a lack of awareness of MGSDP level community engagement activities. Negotiations around management of nature-based solutions were also considered a barrier, as the adoption process, funding alignment and legal arrangements take time to agree. Challenges remain around budgets, resources, and funding cycles – all are closely linked to silo working.

"...despite nearly two decades of successful partnership working and much common ground made, the public bodies are still working in silos following corporate objectives..." - FRMC

3.4 Conclusion

A key benefit is that the MGSDP has broken down silo thinking to a large extent, and established relationships between institutions, public bodies and the wider community. Partnership working has enabled large scale projects where multiple benefits are realised. A weakness of the MGSDP, however, is that it is Glasgow-centric in nature and some silo working remains, and this is a barrier to optimising governance arrangements.

4.0 MGSDP Case Studies

This section details 3 case studies drawn from MGSDP partner experiences with overcoming challenges to facilitate the implementation of holistic solutions. The selection is based on lessons learnt from the partnership experiences, achievement of the MGSDP objectives and guiding principles, and geographical spread. They also evidence the integration of other agendas such as resilient placemaking, active travel, biodiversity, and improving the water environment. Supplementary case study information can be found in Annex 3.



Figure 3 - On-line storage and public amenity areas on Garscadden Burn

4.1 Drumchapel - Multi-partner Cross-boundary Multi-phase

The focus of this scheme is a multi-partner integrated surface water management (SWM) solution in an area with long-standing sewer and watercourse flooding issues. A phased approach was applied to implement a cross-boundary solution by the MGSDP partners East Dunbartonshire Council (EDC), SW and Glasgow City Council (GCC). By working together on the scheme it is estimated that a saving of £1m-1.5m was realised by the partners. The partners initially identified opportunities to join up solutions in SWM planning:

"it was the right way to plan, identify opportunities and work out solutions together for a more holistic drainage solution that removed properties off the flood risk register". – MGSDP Partner

Phase 1 (2014), funded by EDC in collaboration with SW, implemented SWM solutions in a public open space. A skating pond and former play park area were converted to wetlands to provide flood storage areas and enhance local biodiversity. Areas of raised ground aided management of above ground flows with play areas relocated and upgraded to deliver community benefits. Phase 2 (2020) was a £4.8m investment by Scottish Water to upgrade infrastructure and increase local network capacity to address sewer flooding. Phase 3 (2020) funding came via £5m from the Glasgow City Region City Deal and was used to further reduce flood risks in the local area and downstream catchments. The project also unlocked development on previously undevelopable land and created employment and work experience opportunities. Interventions include the creation of on-line storage areas along a local watercourse (the Garscadden Burn) using the natural topography as temporary floodplain storage. Figure 3 shows active travel routes, foot bridges and play areas were also installed to increase amenity benefits for the local community.

LESSONS LEARNT: Partnership working helped to overcome funding and technical complexities and helped drive down costs.

4.2 Smart Canal – Cross-sector Complex Multiple-funding Innovative Solution

The focus of this scheme is a cross-sector innovative solution that enables significant development opportunities. The North Glasgow Integrated Water Management System or "Smart Canal" delivers a new role for an existing asset with the use of 'smart' technology. The process involved complex cross-sector legal negotiations for ownership and multi-capital funding sources (Glasgow City Region City Deal, Nature Scot Green Infrastructure Fund and Scotland's 8th City Programme – Smart City fund).

A 60-year drainage partnership agreement facilitated by the MGSDP was signed between Scottish Canals (SC), SW and GCC for the delivery and management of the Smart Canal. The £17m approach was similar to that used in the Netherlands for some time (Byrne, 2013) and utilises the Forth and Clyde Canal as part of the drainage infrastructure to manage flood risk and surface water in an urban environment. The canal's location through north Glasgow provides a unique opportunity to use its storage capacity - it can 'hold' stormwater during extreme rainfall events for significantly longer than a developed area. Predictive weather technology and sensors provide early warning of storms so that water levels can be lowered in the canal, and thereby create extra capacity for excess rainfall from urban areas (Figure 4). It effectively uses the canal as a conduit to transport stormwater to the River Kelvin.

The Partnership has a clear governance structure with the canal asset owned and maintained by SC, and SW and GCC responsible for development drainage infrastructure. The Smart Canal helps unlock approximately 260 hectares of brownfield land and enables circa 3000 new homes. Additional green space

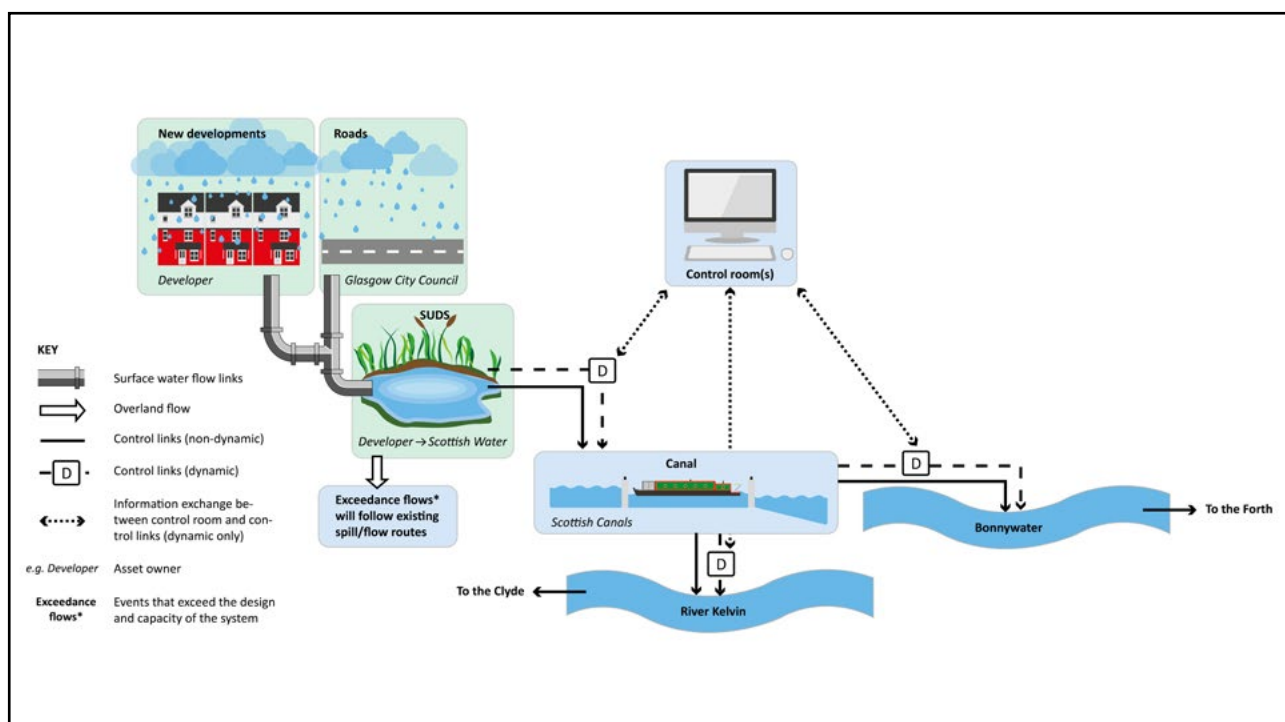


Figure 4 - Schematic of the Smart Canal's Operation.

along the canal corridor ensures water quality, biodiversity, and enhanced health and wellbeing opportunities; active travel routes improve connectivity to the city centre.

LESSONS LEARNT: Partnership working, trust and high-level buy-in is needed. The MGSDP provided the platform that facilitated negotiations including crucial support from MGSDP Board members.

"Without facilitation by the MGSDP - providing the ability to have financing and legal agreement conversations made difficulties much easier to overcome, and without full support of the MGSDP Board, the project may not have happened" – MGSDP Partner

"the willingness of partners to discuss that kind of innovation in a mature fashion is a benefit of the partnership because of the relationships that have been built" – MGSDP Board Member

Negotiations to agree novel ownership arrangements and multiple funding sources, however, took time:

"... joined-up strategy that took 6 years to negotiate. The project has delivered a drainage scheme at a cost of under 40% of the traditional way – saved money and carbon". – MGSDP Partner

SW had to change the way that developers were funded. They normally pay developers once customers are connected. For Smart Canal, they paid in advance" – MGSDP Partner

4.3 Sandyhills Park – Green Space Enhancement Deculverting Shared Funding

The focus of this scheme was the implementation of natural flood management measures to recreate floodplain capacity and resolve localised flooding. Shared funding enabled GCC, SW and SEPA to progress the project in a way which enabled development, and enhanced existing greenspace - including amenity value by de-culverting sections of the Tollcross Burn as it flows through Sandyhills Park (Figures 5 & 6).

The Tollcross Burn was culverted in the 1950s to help meet housing shortages after World War II. The houses were demolished in the 1970s and the area converted into grassland and semi-naturalised woodland. As part of the local surface water management plan (SWMP) and SWs strategic sewerage programme, flood risk was reduced by restoring the floodplain and thereby providing space to increase storage capacity for surface water and creating capacity in the combined sewer network.

Additional upgrades include new paths and a footbridge over the de-culverted burn, providing further amenity value to the local community. Funding, facilitated through the MGSDP, was secured through a combination of Glasgow City Region City Deal, SW, and SEPA Water Environment Fund. Although public consultation was initially deemed successful, once works were completed it became evident that some local members of the community had concerns about the scheme.



Figure 5 - New footbridge over Tollcross Burn

"..we hadn't picked up that there was a section of the community who were very opposed to the works. There is consulting people and there's engaging people. And if people don't actually understand what you're doing, you haven't engaged with them. We still get correspondence from this section of the community." – MGSDP Partner

LESSONS LEARNT: The scheme highlights the difficulties that can be encountered with community engagement. A lesson learnt is to ensure public engagement, rather than consultation takes place.

5.0 Discussion & Recommendations

5.1 Discussion

The Section 3 analysis was considered within the context of transition management theory. Transition management is a governance model designed to encourage uptake of socio-technical innovations (Geels, 2000, Frantzeskaki and Rok, 2018) such as sustainable urban water infrastructure. A cyclical framework was established to influence, facilitate, and organise processes that contribute to a transition over time. This concerns large-scale technological, economic, ecological, socio-cultural and institutional developments that influence and reinforce each other via interactions between different scale levels (niche, regime, landscape), van der Brugge and Rotmans, (2007). The MGSDP were assessed against this framework (Figure 7).

Transition management requires collaborative partnerships to operate at the tactical, operational and strategic levels to successfully implement change. Section 3 illustrates that MGSDP operates at all levels and plays a lead role



Figure 6 - De-culverted Tollcross Burn

in influencing how these levels interact. This indicates that MGSDP is well placed to lead and accelerate the transformative change needed in the water management and sustainable urban community domains in Scotland.

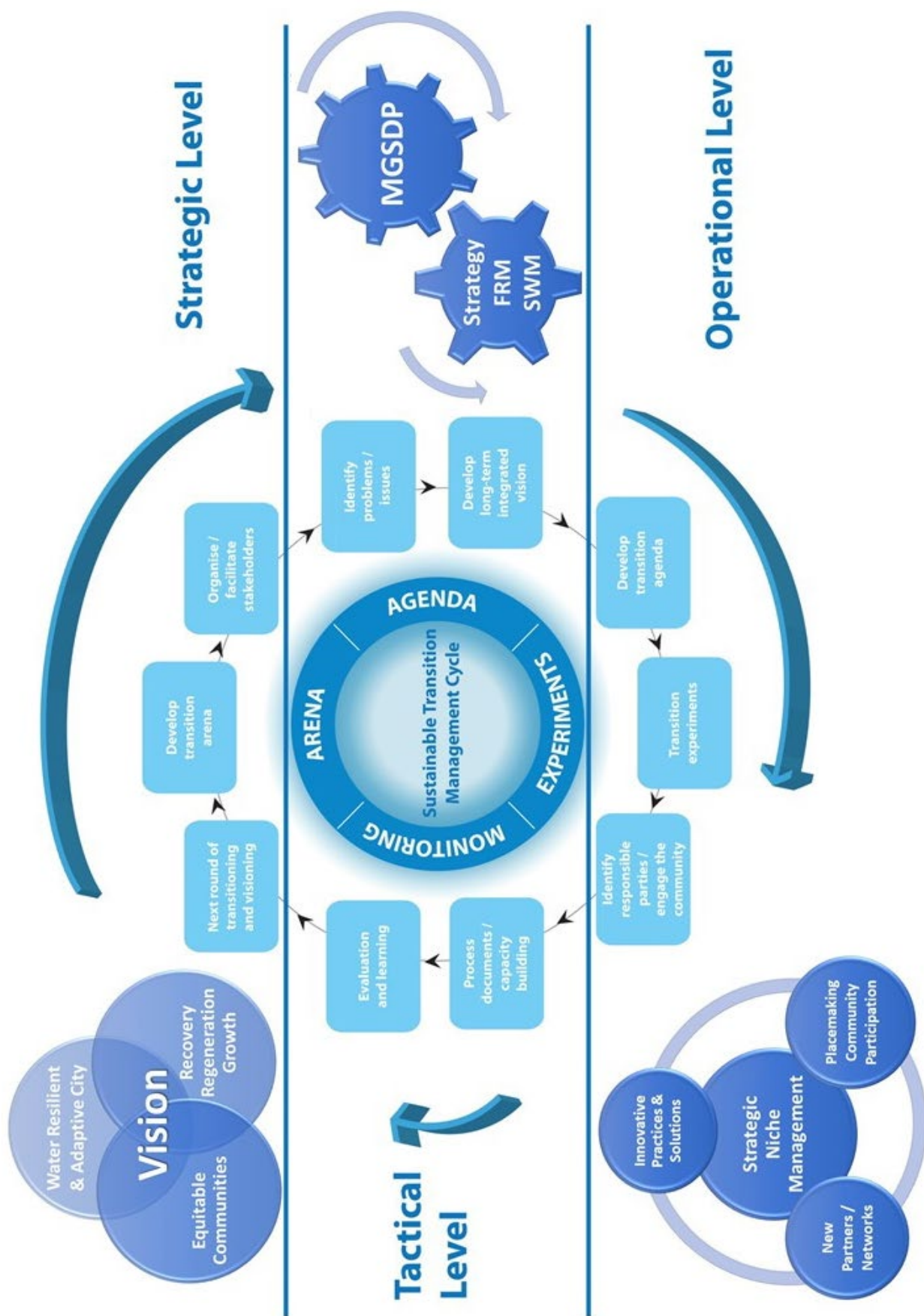
Supplementary information around the discussion and lessons learnt can be found in Annex 4.

5.2 Key Lessons Learnt

Lessons learnt are considered in the context of both MGSDP's future and the development of new partnerships. Although it was felt that establishing good governance and implementing projects has been slow. This was inevitable due to the scale and complexity of the challenges faced, and the time it takes to build trust in a large, broad, cross-sector and multi-level collaborative partnership. Trust is required to efficiently resolve and integrate issues that are delivering transformative change. Delivering infrastructure within a limited budget that aligns with partner aspirations and national agendas is a significant challenge.

The MGSDP would have been less successful if it had not been supported by national legislation and guidance that the partnership itself has informed. As outlined in Section 5.1, an additional success factor has been the implementation of pilot studies to realise the co-developed strategy enabled by the strong partnership.

The MGSDP, however, must now accelerate and mainstream the implementation of SWM solutions and innovative practices. This includes better engagement with communities to successfully align with other Scottish Government agendas (e.g. place making etc.) and initiating new collaborations and networks to widen expertise in the Partnership. This will assist with delivery of the strategic agenda to achieve the renewed vision. This needs to be integrated with better evaluation and monitoring of projects, as decisions made now will inform potential adaptation ability.



LESSONS LEARNT FROM THE MGSDP

1. **Effectiveness** - A PMO / coordinator is required to drive the partnership working process, agenda and sustain strong collaborative groups.
2. **Efficiency** - knowledge building (internal and external) is crucial to avoid narrow-focussed partnerships and deliver broad agendas.
3. **Trust and Engagement** - Early engagement of all stakeholders involved in the process (internal and external) is required. Being open, honest and sharing information builds trust and helps overcome barriers such as lack of equity within a partnership and policy / funding cycles that are not aligned.

LESSONS LEARNT FOR POLICY MAKERS

1. **Effectiveness** - MGSDP benefited from robust coordination which focused all partners co-developed vision.
2. **Efficiency** - Overlapping responsibilities and misaligned funding cycles have been challenges to efficient progress.
3. **Trust and Engagement** - Establishing trust within the partnership leads to enhanced problem solving and a willingness to take risks (e.g. Smart Canal).

The MGSDP strategic agenda remains the modernisation of water infrastructure through implementation of SWMPs to manage flood risk, improve water quality and contribute to the economy by unlocking development constraints. Strategically, the vision must focus on the urgency to deliver equitable and water resilient communities that consider other drivers (i.e. biodiversity, well-being, active travel etc.) via regeneration and recovery. These attributes have been demonstrated with the implementation of pilot projects across the MGSDP area, culminating with the recently established Smart Canal (Section 4.2).

Furthermore, collaborators in new drainage related / water resilient communities' partnerships elsewhere in Scotland must learn to step outside their individual silos (and comfort zones) to effectively build long-term relationships. This will assist in understanding the challenges and priorities of partner organisations to develop a long-term strategy. The FRML have learnt that partnerships need good leadership and commitment. Although there are crossovers for collaborative working if applying the MGSDP governance model, drivers and aspirations will be different in each area and for each new partnership.

5.3 Recommendations

For the MGSDP:

- A1. Agree a public facing vision which reflects the ambitions of all partners including current Scottish Policy drivers, such as equitable water-resilient places and the climate / biodiversity emergencies.
- A2. Establish a clear understanding of how drivers (activities and decision making) align with national

legislation, local policies, and institutional goals.

- A3. Ensure 'champions' and high-level decision makers are members of the partnership.
- A4. Establish clear partner roles for each group in the partnership, particularly the Technical Group.
- A5. Rotate chairs of the different management and working groups to increase inclusion across stakeholders and regions in the partnership.
- A6. Build on pilot project successes (and learn from failures) to mainstream innovative solutions.
- A7. Develop an asset register database for schemes, and regularly inspect / monitor a sample to ensure long-term effectiveness, demonstrate that they are 'fit for purpose' and build an evidence base.
- A8. Explore additional mechanisms to increase visibility and share knowledge of the work being undertaken to assist in the establishment of best practice governance arrangements in new collaborative partnerships across Scotland.
- A9. Quantify local multiple benefits provided by solutions using available industry tools.
- A10. Consider equity and inclusion at the outset in planned regeneration / redevelopment programmes. Ensure engagement and education of the wider community to enhance informed decisions in these areas. Consider engaging with local citizen science initiatives (e.g. 'The Conservation Volunteers Scotland').

For the Flood Risk Management Community:

- B1. Recognise that it takes time, resources and commitment to set up and maintain partnerships – to build trust and get the relevant partners to work together over an extended period of time and manage changes in individual personnel. Without appropriate commitment from organisations to engage with the process, maintaining the partnership becomes more difficult and less productive.
- B2. Develop the strong collaborative partnerships required to drive drainage transformation agendas.
- B3. Ensure larger partners do not dominate partnerships, and that “silo thinking” does not hold back progress.
- B4. Recognise that a diversity of stakeholders, skill sets and levels of experience is important if projects are to succeed.
- B5. Consider the funding required for long-term management and adaptability of projects in response to the climate / biodiversity emergency.

For Scottish Government Policy Makers:

- C1. Develop a blueprint for Blue-Green Infrastructure solutions focused strategies and implementation for use by water partnerships.
- C2. Encourage top level buy-in from organisations to give commitment and strength to taking initiatives forward.
- C3. Continue to support the water sector by improving coordination of policies and initiatives across sectors (linking to climate / biodiversity, wellbeing, active travel, etc.) for the delivery of 'great blue-green places to live' (Scottish Government, 2021 and Beveridge et al, 2016) .
- C4. Develop a framework for inspection and management of schemes, with realistic national guidelines and standards.
- C5. Encourage community stewardship, community buy-in and citizen science to be part of projects and blue-green solution strategies – from pre-planning design stage through to construction, operation and aftercare.

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