

Flood Risk Management Scotland: Governance and Developing Shared Agendas

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May 2019*

Executive summary

Aims and Findings

This report looks at the governance of Flood Risk Management (FRM) in Scotland with the aim of identifying areas for improvement to develop shared agendas among all FRM stakeholders. Furthermore, this project includes the additional aim of investigating Transport Scotland's (TS) role within Scotland's FRM framework and whether their role should be reconsidered; primarily by discussing the potential for making TS a responsible authority (RA) under the Flood Risk Management (Scotland) Act 2009 (FRMA).

This work is useful because there is a need to develop shared agendas among all stakeholders involved in FRM in Scotland. Currently, stakeholder objectives are not aligned on a nationwide level with many stakeholders operating under their own agenda and prerogative. While this is understandable, we believe there is an opportunity to focus on nationwide objectives for the progress of FRM in Scotland. This work is further useful as while TS operates to keep transport networks open and FRM is, therefore, part of what they do. They are not legally required to carry out FRM functions. For that reason, it is at least worth starting the discussion of whether TS should become an RA.

By holding semi-structured interviews and through questionnaire responses, we found from those involved in FRM that there are many areas which could be reviewed and perhaps given more consideration. We found that priorities relating to FRM are variable depending on who you ask and the organisation they represent. For example, those who are not FRM professionals like those part of community flood groups concerns mostly relate to community engagement from responsible authorities and funding. While those from responsible authorities are more concerned with hitting statutory targets as required by the Flood Risk Management (Scotland) Act 2009. Thus, highlighting a disparity between FRM stakeholders and those affected by flooding. Furthermore, when asked whether it would be a good idea to make TS a responsible authority, 62.5% of participants answered yes, 34.5% answered don't know and 3% answered no.

Recommendations

As a result of the findings from this report, some ideas for next steps for FRM in Scotland are discussed. Firstly, the best flood prevention action for a vulnerable zone or community should be found irrespective of the ability to fund it. Then, compromises can be made or alternative funding

streams can be sourced to implement the flood prevention action. This ensures the action is the best possible option at that time. Furthermore, individuals with experience in flood mitigation actions should be employed by a responsible authority to guide LAs and other authorities in the recognition and implementation of flood prevention practices. Scotland may also look elsewhere to countries which effectively manage their flood risk and take the best parts of their practice and implement it into ours.

From a TS point of view, more can be done to include TS in discussions surrounding flooding thus aligning priorities across FRM stakeholders. The knowledge TS have of roads drainage and flooding means they should be involved in FRM plans and strategies in cooperation with Local Authorities (LAs) and other RAs, for example the Scottish Environmental Protection Agency (SEPA). TS understanding and, the sharing of that knowledge, good practice and data may create benefits for partnership working. Also, if they were to have legislative requirements under the FRMA, TS may have to create a branch or give more responsibility to individuals when it comes to FRM. This would put FRM higher up in their agenda and the resources to consider FRM in greater detail. An investigation into the potential benefits of making TS an RA may be deliberated with input from various other organisations.

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1 Project Background

1.1 Issue

When Scotland made the decision to introduce a more sustainable and modern approach to FRM that is better suited to the current situation and can accommodate future climate change impacts. They were in the desirable position of having an almost entirely blank canvas to work with. The Flood Risk Management (Scotland) Act 2009 (FRMA) allowed clear aims and objectives to be set while replacing archaic acts incorporating the European Parliament Directive on FRM (2007/60/EC).

While the introduction of the FRMA has been successful, issues arise when the stakeholders are considered. Currently, under the FRMA, statutory guidance from Scottish Ministers is available for the following responsible authorities (RAs): SEPA, local authorities (LAs), Scottish Water, Forestry Commission Scotland, Cairngorms National Park and Loch Lomond and the Trossachs National Park. At this level, priorities, aims and objectives are aligned. But, as it trickles down to the local level, issues arise. A lack of funding and direction for LAs make the implementation of flood risk actions difficult. There is a disparity in the aims and objectives set out in the act with stakeholders, understandably, functioning under their own way of doing things.

Furthermore, as this project was carried out in collaboration with Transport Scotland (TS), we believed it was worthwhile to investigate the role of TS in relation to FRM. Also, to get the perspective of professionals from other stakeholders and whether they believe it would be beneficial to name TS an RA. They are responsible for Scotland's transport networks, are an agency of the Scottish Government and accountable to Scottish Ministers, so there is already scope for discussion around the subject. However, do they have the resources to effectively carry out this expansion? Is there a quantifiable need for TS inclusion as an RA? Would TS being named an RA be of noticeable benefit?

The 'Findings' section of this report discusses issues which arise from the situation explained in the previous paragraphs by hearing the responses of those involved in FRM in Scotland. The 'Investigation (Methodology)' section of the report explains in greater detail how the findings were obtained. The 'Discussion of Options' section discusses potential next steps.

1.2 Project Collaborators

Some background for the collaborators involved in the management of the project including website links to find further information.

1.2.1 Transport Scotland

Transport Scotland is Scotland's national transport organisation; they are an executive agency of the Scottish Government and accountable to Scottish Ministers. Their aim is to provide safe, efficient, cost-effective and sustainable transport systems for the general public of Scotland.

<https://www.transport.gov.scot/>

1.2.2 ClimateXChange

ClimateXChange (CXC) is Scotland's centre of expertise for linking climate change research and policy for the Scottish Government.

<https://www.climateexchange.org.uk/>

1.2.3 The Edinburgh Centre for Carbon Innovation (ECCI)

The Edinburgh Centre for Carbon Innovation (ECCI) is a hub for low carbon technical, social and business innovation. ECCI is the base for CXC and is also involved in their management.

The ECCI collaborate with the Natural Environment Research Council (NERC), and part of their collaboration involves a Consultancy Innovation Programme (CIP). This project is the result of a CIP. The CIP aims to generate industry and policy engagement whilst making the most of innovation opportunities. The CIP partners NERC funded Edinburgh, Earth and Environment Doctoral Partnership (E₃ DTP) PhD students with meaningful consultancy placements in policy or business.

<https://edinburghcentre.org/> (ECCI website)

<https://nerc.ukri.org/> (NERC website)

<https://e3partnership.wordpress.com/> (E₃ DTP website)

1.2.4 The University of Edinburgh (Blair Mackie)

I am based at the University of Edinburgh's School of Engineering working within the Institute for Infrastructure and Environment (IIE). My PhD project is investigating a novel methodology for the bioremediation (depollution) of freshwater and industrial wastewater effluents.

The internship (this project) was offered to me as one of ECCI's CIPs (section 1.2.3). I am part of the E₃ DTP and therefore NERC funded and able to undertake an ECCI CIP alongside my studies.

<https://www.ed.ac.uk/> (The University of Edinburgh website)

<https://www.eng.ed.ac.uk/> (The University of Edinburgh's School of Engineering website)

<https://www.eng.ed.ac.uk/research/institutes/iie> (The University of Edinburgh's School of Engineering IIE website)

<https://edinburghcentre.org/projects/nerc-e3-dtp> (NERC CIP website)

2 Investigation (Methodology)

2.1 Stakeholder Interviews

The interviews were conducted in the form of thirty-minute semi-structured face-to-face interviews. Interviewees were contacted and briefed beforehand about the purpose of the interview, the project and their consent acquired. The purpose of the interviews was to hear the opinions, roles and experiences of professionals involved in FRM from stakeholder organisations. All findings are anonymous.

Questions were asked to provide structure, but for the most part, the idea was to have an open discussion in the hope that interviewees would provide authentic answers for the benefit of future FRM in Scotland. The questions were deliberately kept non-specific to encourage open conversation and to accommodate the wide range of professions that were interviewed, so they can talk about FRM from the perspective of their remit.

With the help of supervisors at Transport Scotland, relevant professionals from TS, SEPA and other FRM stakeholders were identified and interviewed. We felt it was important to tap the right people on the shoulder to gain insight into the current FRM landscape and hear their thoughts to develop coherent agendas among the various stakeholders in FRM.

2.2 Questionnaire

The questionnaire was created using an online survey creator. Then using the Sniffer Flood Risk Management 2019 Conference delegate list, emails were sent out to over 100 professionals and

others involved in FRM. The email contained a link to the online survey where responses were recorded. The reason for this was to obtain answers from varying backgrounds, professions and localities around Scotland. All responses are anonymous.

The number of responses was high and included many different outlooks. Responses came from volunteers/members of community flood groups, community councillors, emergency response team members, Scottish Water, SEPA, consultants, flood prevention designers, local authorities, the Scottish Flood Forum and charity workers.

The questions asked were very similar to those asked in the stakeholder interviews. Participants could include as little or as much information as they desired in their answers. There was also a section for participants to add extra comments so they could include information on any aspects they thought may have been overlooked or not mentioned in the questions.

3 Findings

3.1 Stakeholder Interview Findings

A summary of the findings from the semi-structured interviews.

3.1.1 Is the Current Approach to FRM Working Well in Scotland?

When interviewees were asked how they think the current approach to FRM is working in Scotland, the response was predictably along the lines of 'yes it is working well but there is always room for improvement'. The FRMA was a very significant step forward for FRM in Scotland and key stakeholders gained an improved understanding. The six-year review cycle where LLAs take strategies and plans developed in partnership with SEPA has worked well and as we are coming to the end of the first cycle, it will be interesting to see how the next cycle plays out. It is anticipated the second cycle will be harder due to vulnerability increasing (climate change) and perhaps to a certain degree, complacency from the success of the first cycle.

Working well is the relatively short distance within the FRM community. Representatives from SEPA were pleased to report the overall ease of getting those involved in FRM from all over Scotland together for discussions, conferences and such like. Other European countries are perhaps envious of the massive benefit of Scotland being a small country. But, being a small country does not necessarily mean more resources.

Interestingly, there was a discussion about the annual £42 million of funding from the Scottish Government set aside for flood risk actions is only a fraction of the money spent in total on FRM for the whole of Scotland. Especially when you consider the number of companies privately protecting their assets against flooding. Therefore, this led to a discussion about the potential development of a methodology to calculate how much money is spent in total. This could then lead to getting more for your money by the co-design and co-delivering of flood mitigation mechanisms and getting 'more organisations in the tent' to fund such projects.

With regard to TS, it was not greatly understood how well the current approach to FRM in Scotland is working. Understandable due to the various other priorities TS has. However, discussion about operating companies (OCs) responsible for Disruption Risk Management Plans (DRMPs) and its effectiveness depending on the OCs completing them, which doesn't always happen. Transport Scotland provides documentation on requirements of OCs for the preparation and maintenance of DRMPs when carrying out contractual work on Scotland's transport networks. It was also mentioned that DRMPs do not include a follow-up action plan; therefore how useful is it?

3.1.2 How well do Professionals from Different FRM Stakeholders Interact?

Across the board, engagement and interaction between stakeholder professionals were praised by those interviewed. However, from a TS point of view, it was explained that OC compliance with their

contractual responsibilities can sometimes be difficult to obtain. It was also explained that licensing requirements with regard to asset flood actions are often a hindrance. Also, there is not a formal approach or requirement for TS to meet other stakeholders regarding FRM but their engagement has improved recently. A commitment from TS for meeting with other FRM stakeholders is something that should be considered when investigating whether TS should become an RA.

3.1.3 How Could the Government Pull Together Resources for a More Effective FRM Strategy?

The issues surrounding this question mainly revolve around the issue of funding. For example, local authorities report a lack of technical resources to fulfil flood prevention actions as a result of funding shortages. SEPA representatives report that this question is very much what they are trying to achieve as part of their FRM roles and responsibilities. Suggestions included considering other stakeholders. For example, insurance companies who have an abundance of information about those affected by flooding due to claims but do not necessarily share (or have to share) that information.

3.1.4 How can Data Relating to FRM be Better Used or Shared?

All interviewees stressed the importance of data. TS necessitate data from OCs and it was stated that if all OCs did it at the scale TS requires the data, it would be useful. Furthermore, the creation of a central hub for FRM data with open access was discussed. In theory, an open-access central data hub is a good idea but there are various issues with licensing and the unwillingness of maybe certain stakeholders to provide such data. It was proposed that the Scottish Government would perhaps need to get involved and knowledge exchange with data license experts could be explored.

Another interesting discussion took place with regard to how much data do you need to make an informed decision; especially with climate change increasing the severity and frequency of flooding events. If you consider the situation in 30 years or even 50 years' time, is this adequate if considering the situation in 100 years? Is retrospective data able to be used more effectively to shed light on the unknown?

3.1.5 Should Transport Scotland be given more Responsibility when it comes to FRM?

SEPA is very keen to include TS more in discussions surrounding FRM decisions and it is reported that TS is showing a presence more and more at such get-togethers. SEPA representatives believed it was a good idea to make TS an RA and it would make sense as they are part of the Scottish Government. Recently, the Forestry Commission Scotland were given a recognised role in FRM and perhaps TS could follow suit.

TS was unsure if this would be beneficial due to the nature of how TS operates. They are separated into directorates with various branches. It is not down to just one branch to consider FRM, it is more FRM, almost subconsciously, being part of the day to day operation at TS. Some branches need not consider FRM. A separate branch with FRM responsibility may be a suitable addition to the current TS structure. They would be able to fulfil FRM obligations under the legislation but also aid other branches at TS in FRM. Obviously, this comes down to resources, funding and various other factors. But, a new branch with FRM as a key responsibility is something TS may wish to consider.

3.1.6 Related Issues Believed to be Important by Interviewees.

Universally, climate change was brought up by interviewees. In a nutshell, this has to be given greater consideration in future FRM actions. It was explained that climate change scientists with the know-how of data integration are key to making sure future FRM actions have climate change adaptability factored in.

Aside from climate change, it was discussed that the construction of infrastructure and the use of more tarmac will lead to more flooding. Consideration must be given to ensuring areas where flooding can be naturally dealt with not be disturbed. Greater thought may be given to asset management and sustainability also including asset relocation and a greater understanding of assets at repeated risk.

3.2 Questionnaire Findings

A summary of the responses obtained from the online questionnaire. A high number of responses was received, key responses are discussed.

3.2.1 Is the Current Approach to FRM Working Well in Scotland?

Similar as to what was found in the interviews; the current approach to FRM is working well in Scotland but there is always room for improvement. It has been a new way of doing things and a learning exercise for all as we come to the end of the first cycle. However, it is clear from the responses that those from RAs report that all requirements/objectives/actions under FRM strategies of the act's first cycle will be met. While, some of those from, for example, community-based groups report they are still without adequate flood protection and if they are to be flooded (again), they anticipate a slow response. Therefore, this suggests that FRM in Scotland has made progress toward objectives, but for many communities, there is no tangible improvement in actual protection against flooding.

FRM plan driven actions are being delivered across the country but it has been explained in a couple of responses that there is a level of non-compliance across the country with no mechanism to reveal the level of non-compliance. It is also suggested this may be due to a lack of funding/resources as this has been substantially reduced since plans were developed meaning LAs cannot fulfil legislative duties.

3.2.2 How well do Professionals from Different FRM Stakeholders Interact?

Commendably, it is reported that professionals from various stakeholders interact well with one another. But, this question is more aimed at whether cooperation on FRM actions is effective. Overall, this is variable, FRM from different stakeholder's point of views is not a homogenous landscape and there is an overlap of responsibilities. There are differing expectations and understanding of FRM objectives across stakeholders, particularly those which are not designated responsible authorities. However, there are good examples of partnership working that has been developed as a result of the act. Links that have been established and continue to be established will only improve in the long term. Regular meetings of LFRMP, SCOTS and SAIFF groups drive cooperation.

Interaction between RAs is reported as very good, but not as good with wider stakeholders, such as consultants and communities that are at risk of flooding. Not all organisations have resources to interact fully (e.g. TS, Network Rail and Forestry Commission Scotland). Joint actions mean dedicated time which cannot always be promised due to a lack of resources within stakeholders.

Furthermore, it was consistently seen in responses that funding cycles among stakeholders are not consistent which, in turn, makes collaboration challenging. The multiple agencies working to address FRM, however, do try to work collaboratively whenever feasible.

3.2.3 How Could the Government Pull Together Resources for a More Effective FRM Strategy?

Out of all the responses to this question, the most common theme was funding. Lack of funding and misaligned funding cycles highlight that funding has a significant effect on the rate of progress of FRM. Flexible funding is needed, which right now, isn't possible under the current governance framework. FRM is long term planning which doesn't lend itself to the structure of government with yearly budgets, election cycles and lack of certainty with leadership. The current struggle for resources doesn't lend itself to promoting the most sustainable actions or co-delivery as funding cycles and timescales for action across organisations don't align. Current funding mechanisms make sustainable FRM aspirations and longer-term planning for climate change difficult. Long term commitments based on short term decisions is a major barrier to the effective implementation of various policy aims. Government at a national and local level require greater coordination of resources in applying a proactive approach to FRM. Some responders also highlighted that the £42 million annual budget set aside for FRM is simply not enough.

Furthermore, responses highlighted the need to train the next generation of flood risk managers. There is a lack of qualified graduates in this field and efforts to establish an FRM trainee programme which was an issue when the FRMA was implemented but has been lost.

3.2.4 How can Data Relating to FRM be Better Used or Shared?

Much of the responses to this question revolved around the idea of creating a central hub for FRM data as it was prompted in the online questionnaire. It was generally agreed that an easily accessible central hub for data would be useful. It was suggested that a central hub for data storage is not necessarily needed, but a hub for making data visible, a centrally agreed data standard and coordinated means of sharing data is definitely useful for the FRM community. However, if it were that simple to be created, it would have already be done. There are various legal and ownership issues which prevent this and is an ongoing frustration for the community.

In an ideal world, truly open data would be available. There are further concerns to consider with the different data managing systems and software different organisations use. Again legal constraints are the biggest issue with one consultant highlighting that projects are often delayed due to data licensing and availability. One responder made the argument that public money is spent on FRM and therefore the data should be open to anyone that has ever paid tax in Scotland at least.

3.2.5 Should Transport Scotland be given more Responsibility when it comes to FRM?

62.5% of participants answered yes, 34.5% answered don't know, presumably due to lack of knowledge of what the advantages and disadvantages would potentially be, and 3% answered no, as they could not see any benefits of naming TS an RA.

Reasons for answering yes include TS's knowledge of rain drainage and flooding as gully/culvert capacity is a large source of surface water flooding. Better understanding in this area would encourage partnership working. Also, naming TS an RA would most likely put FRM actions higher up on their agenda. Flood risk issues pertaining to transport networks must be taken seriously given the potential for significant national impact. It is worth noting that many answered yes without giving the reasoning for their answer.

Reasons for answering don't know include uncertainty of involving another agency bringing positive results as in some cases it can cause dysfunction. One response said previous attempts to engage with TS have been unsuccessful due to a presumed lack of resources at TS. Also not sure if a formal, designated role would strengthen FRM in Scotland as TS has been attending more FRM events and are becoming more linked in already.

Reasons for answering no include the overall low sensitivity of keeping transport networks open compared with flooding of, for example, housing and anything else outside of roads is not their remit. Also, there is a lack of hydrologists experienced on coastal, fluvial and pluvial flooding. Unlikely that TS will have hydrologists but only civil engineers proficient in transport construction materials which is not what the community requires.

3.2.6 Related Issues not Mentioned in Questions but Believed to be Important.

From a community point of view, council FRM planning should be required to actively consult with the public when considering flood mitigation developments in a catchment area. They should be required to demonstrate the impact the proposed development will have. Also, it was suggested that the FRMA be amended to allow areas which have been flooded to be added to the Potentially Vulnerable Area (PVA) list without having to wait until SEPA completes its six-year review of the whole of Scotland. The key message being community access and engagement should surpass local councils with broader community involvement. Suggested was a set of national principles that support partnership working with flood risk communities could be beneficial. Offering good practice guidance and incentives to uptake property level protection products and undertake self-help actions.

Other issues brought up include roads drainage being a key issue which is often overlooked and more involvement from LA roads departments is required. Climate concerns not being actioned

proactively. Flood management for new housing, retail and industrial developments should be given greater consideration as neglect in these areas causing increasing flood risk cannot simply be blamed on climate change. Further suggestions include a more strategic view of climate change should be considered. The situation in 100 years' time must be measured so actions implemented now are not a waste of time, money and resources.

4 Discussion of Options

4.1 FRM in Scotland

After review of the responses obtained, options are discussed for next steps in FRM.

Funding was by far the most mentioned issue in the questionnaire responses. But, what can be done to improve the funding situation apart from restructuring funding cycles; which is most likely, not possible. Alternatively, the decision to invest in the best solution for a community should be made irrespective of the ability of various bodies to fund. There need to be further developments in fund calculating/fundraising to bring together subsidy from each parties remit and this should be looked at after the best solution is found. This involves bringing together all parties, including community representatives, who may be able to provide funding for the flooding related project. Once this process has been completed, alternative solutions can be explored. To aid in the process, a methodology for mapping of what projects are happening and the organisation responsible so that efforts, expertise and funding are better used.

Secondly, employ individuals with experience in flood mitigation to train communities in how to recognise and deal with flood-related issues. Site visits to areas which were previously vulnerable (case studies) would be desirable. Professionals whose role includes explaining, demonstrating and advising on how to overcome different flood-related scenarios. Furthermore, an FRM trainee programme should be investigated and possibly, in collaboration with higher education, research or college institutes to ensure qualified and knowledgeable graduates are coming through.

Finally, Scotland can look at how FRM is done elsewhere. Those specifically who are successfully delivering a holistic approach to the management of flood risk. For example, Ireland has adopted a proactive catchment approach which considers sustainability, Sustainable Urban Drainage Systems (SUDS), natural FRM, climate change adaptation and home relocation schemes for affected households.

4.2 Transport Scotland

After review of the responses obtained, should TS give consideration to becoming an RA?

In recent times, TS has been getting more involved in FRM related discussions. Greater collaboration between TS and FRM stakeholders may be facilitated by an already established RA such as SEPA. When it comes to SEPA, LAs and other RAs cooperating to create flood plans and strategies as required under the FRMA. TS is not required to attend but it would make sense to involve them as road drainage is a vital part of flood mitigation. They have information about culvert locations and capacity and sharing of knowledge would create benefits for partnership working. It is unclear whether a formal, designated role would improve flood plans and strategies, but if it would, then TS being named an RA should definitely be considered.

Moreover, TS does not have employees to deal with FRM exclusively. Those who do attend flood-related meetings have many other roles and responsibilities. If TS were able to create a branch or employ individuals whose main responsibility is FRM, they could be more locally involved. It is my understanding that because TS is a national organisation, they are not represented at local meetings. This may be restructured but requires employees with resources to attend such meetings. Obviously, the inception of this comes down to many factors like funding to employ those in this role and

resources to support them. TS inclusion would increase resources available potentially including funding. If TS were to be an RA, it may also make resource allocation easier. The PVAs identified for action in FRM cycle 2 could involve TS input from the outset. TS could have a very important role to play in future FRM in Scotland and I think it is definitely worth starting the discussion around this topic. An in-depth investigation with an analysis of advantages and disadvantages is desirable.

5 Conclusions

It is important to remember, it has only been a decade since the introduction of the Flood Risk Management (Scotland) Act 2009. Fourteen FRM strategies and 14 local FRM plans have been published with on-going monitoring. The strategies and plans have resulted in over 2500 flood-related actions and decreasing flood risk in a number of areas around Scotland. Networks have been established (NFMAG, 14 LPD partnerships, CBAG, LLAF, SFF, SCOTS FRM group, FRM LAGs, SAIFF groups and community groups) and there has been effective partnership working between FRM stakeholders. There is also a greater understanding of what causes flooding and the consequences at a local level.

However, there are still challenges to overcome, which can be viewed more optimistically as opportunities for a more effective FRM nationwide strategy for Scotland. Community engagement from responsible authorities to support the creation of empowered and supported communities to shape flood resilient communities is desired. Furthermore, future flood risk assessments must include climate change consideration and the same goes for related flood protection actions. Climate change adaptation in Scotland's FRM planning approach and creative community engagement are opportunities for a more effective FRM strategy. Responses in interviews and the questionnaire highlight funding being the cause of many issues which may prevent challenges from being overcome. Therefore, funding issues must be given more consideration by the powers that be to deliver real change leading to better FRM in Scotland.

Transport Scotland being named a responsible authority was, for the majority of responders, viewed as a positive step for FRM in Scotland. TS becoming an RA would involve sharing of knowledge that TS has of flooding in transport areas positively impacting FRM plans and strategies. It may further develop successful networks and effective partnership working as seen since the launch of the FRMA. TS becoming an RA may also increase the resources available to LAs to carry out flood-related actions and the possibility of increased funding for such projects. However, a full investigation into the advantages and disadvantages of naming TS an RA is desirable. The hope of this project that it at least starts the discussion around this topic.

6 Appendix List of Abbreviations

CBAG – Cross Border Advisory Group
CXC – ClimateXChange
DRMP – Disruption Risk Management Plan
E₃ DTP – Edinburgh, Earth and Environment Doctoral Training Partnership
ECCI – Edinburgh Centre for Carbon Innovation
EU – European Union
FRM – Flood Risk Management
FRMA – Flood Risk Management (Scotland) Act 2009
FRM LAGs – Flood Risk Management Local Advisory Groups
IIE – Institute for Infrastructure and Environment
LLAF – Lead Local Authority Forum
NERC – Natural Environment Research Council
NFMAG – Natural Flood Management Advisory Group
OC – Operating Company
PhD – Philosophiae Doctor (*Doctor of Philosophy*)
PVA – Potentially Vulnerable Area
SAIFF – Scottish Advisory and Implementation Forum for Flooding
SCOTS – Society of Chief Officers of Transportation in Scotland
SEPA – Scottish Environment Protection Agency
SUDS – Sustainable Urban Drainage Systems