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Aligning Flood & Coastal Erosion Risk Management and Well-being in Wales

An analysis and evaluation of FCERM governance

Meghan Alexander, Emma McKinley & Rhoda Ballinger
Cardiff University, UK

November 2019

CoastWEB

CoastWEB - Valuing the contribution that coasts make to human health and well-being, with a focus on the alleviation of natural hazards and extreme events

Aligning Flood & Coastal Erosion Risk Management and Well-being in Wales

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Executive Summary

Rising sea levels and climate change projections mean difficult decisions need to be made about how best to manage our coastlines – this entails balancing the need for sustainable Flood and Coastal Erosion Risk Management (FCERM) and the preservation of well-being in at-risk communities. In Wales (UK), this is further reinforced by the *Well-being of Future Generations (Wales) Act 2015* and the associated commitment to seven national Well-Being Goals, reflecting the economic, social, environmental and cultural facets of well-being (Figure ES.1).

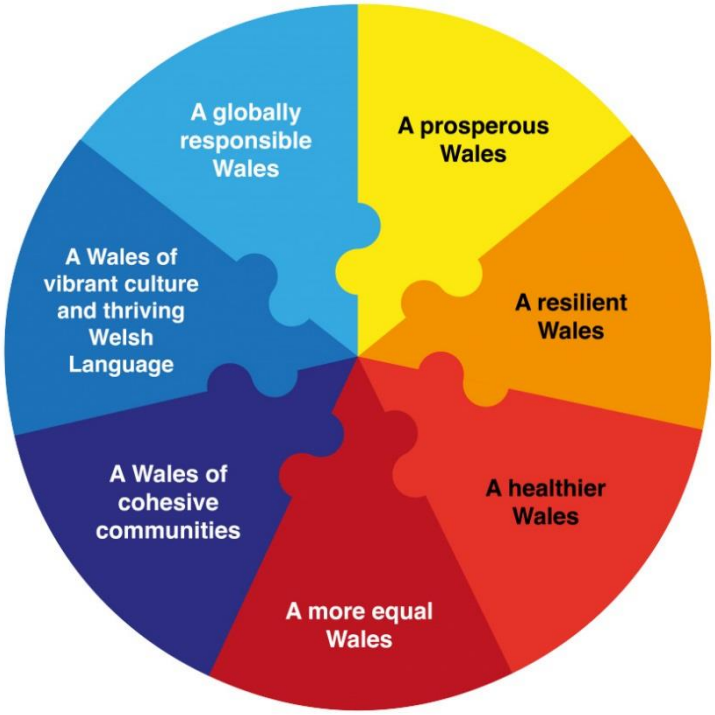

Figure ES.1: The seven national Well-being Goals in Wales

Focusing on the relationship between FCERM and well-being, this research examines the strengths and weaknesses in current FCERM governance, and the synergies and conflicts between FCERM and the national well-being goals. The research examined all aspects of FCERM, from catchment to coast, focusing in particular on coastal, fluvial and surface water flooding. The research carried out an in-depth policy and legal analysis of approximately 200 documents, including all current (or recently closed) consultations *published before the 10th October 2019*. This analysis was accompanied by 47 interviews (between December 2018 and September 2019), with policymakers and practitioners operating at national and local scales in Wales. The results were further validated through a stakeholder workshop in July 2019.

This report presents the outcomes of this analysis and provides a commentary on the current state of affairs in Wales, reflecting critically on the implications of current FCERM governance upon the well-being of current and future generations to come. This led to the identification of

34 recommendations, related to policy, practice and future research needs (summarised in Table ES.1, below).

Although the report is primarily targeted towards policymakers and practitioners in Wales, the report may also be of interest to others working within FCERM in other parts of the U.K. or elsewhere, or with an academic interest in these matters.

A summary of this report is available from https://www.pml.ac.uk/CoastWeb/Home.

Table ES.1: Recommendations moving forwards

Recommendations
Strategic matters
1. There is a need for urgent action in the current climate emergency - Welsh Government should strengthen its strategic policy around coastal adaptation and display a greater sense of urgency when developing and implementing adaptation planning. Longer-term adaptation should be better embedded within the risk-based paradigm of FCERM, forming an explicit objective within the revised National Strategy for FCERM in Wales, alongside specific adaptation-based measures to provide greater clarity to all stakeholders (including the public) about the future. Longer-term ambitions should be clearly stated. 2. Reframing problems and solutions – FCERM should be understood as a key component of climate change adaptation and seen as part of a wider social, economic and environmental challenge that demands a diversified approach, in addition to protective measures. Moreover, climate change adaptation should be given the same level of priority within Welsh Government as climate change mitigation and decarbonisation goals. 3. There is a current lack of clarity in how Welsh Government understands and expresses the contribution of FCERM to the Welsh well-being goals. Stronger leadership from Welsh Government is essential if it is to maximise its strategic steering capacity. Welsh Government should specify well-being objectives within the National FCERM Strategy and consider specific measures for monitoring progress against these.
Funding
4. Diversifying funding sources and establishing 'funding partnerships' will be essential for maintaining and enhancing FCERM and wider well-being benefits in the face of future threats. However, further research is required to better understand how this might be implemented, barriers addressed and action incentivised. 5. A boost and long-term commitment to revenue funding is required to keep pace with the rising demands facing FCERM associated with climate change. 6. The methodology for prioritising FCERM capital funding should reconsider the weighting assigned to multiple benefits to better incentivise delivery of wider well-being goals. This could conceivably vary depending on different categories of FCERM schemes.

Recommendations
7. There is no clear funding stream to support adaptation schemes requiring the managed realignment or decommissioning of assets, or relocation of people and property. To address the current 'adaptation gap' in funding, there is a need to re-think how funding is prioritised within the CRMP/FCERM programme, which currently favours traditional defence-based approaches and disadvantages adaptive-based schemes. This creates inequalities in the accessibility of FCERM funding that must be addressed. Moreover, efforts must be made to bridge current departmental silos and unlock opportunities for cross-department and cross-sectoral funding. 8. Further research is required to address remaining evidence gaps in quantifying the benefits of catchment/area-based approaches, Natural Flood Management and hybrid approaches, as well as the wider well-being benefits associated with FCERM schemes.
Coastal adaptation
9. Long-term funding for the Wales Coastal Monitoring Centre should be secured beyond 2022 to maintain a strategic approach to coastal monitoring, essential for supporting evidence-based decision-making and coastal adaptation planning. 10. There is a need to raise the profile of Shoreline Management Plans (SMP2) amongst a broader remit of stakeholders operating at national to local scales, in order to better embed shoreline management in strategic planning at the land-sea interface. This could be supported by efforts to diversify and motivate wider participation within Coastal Groups (e.g. Network Rail, National Trust and other relevant Local Authority departments). The Wales Coastal Groups Forum is well-placed to develop a communication strategy to explain the relevance of SMP2 to a wide range of organisations/departments and support this endeavour. 11. In order to sustain the valuable role played by Coastal Groups, and ensure regular attendance from local authority members, there is a need to investigate options for overcoming resource constraints and potential opportunities for pooling resources. 12. Coastal adaptation is seriously constrained by the absence of governance mechanisms and policy instruments, and lack of strategic leadership from Welsh Government. Further research is required into innovative governance mechanisms for enabling adaptation (e.g. looking across FCERM, spatial planning, building regulations and insurance sectors for example), alongside critical questions about who should pay. 13. Adaptation is a *process* – effective frameworks (not projects) are essential for navigating this and providing a route-map for locally-driven decision-making. However, a national strategic framework through which to deliver adaptation on the ground is essential. Stronger leadership and support from Welsh Government is required in this regard. While the proposed coastal adaptation toolkit/guidance may be useful, this needs to be coproduced between Welsh Government, Coastal Groups and the Wales Coastal Groups Forum to ensure it matches the needs of those implementing adaptation at the local scale. 14. Legislative rigidity in the form of Public Rights of Way is a key barrier to implementing coastal adaptation. Aligning Public Rights of Way and Highways legislation with coastal adaptation requirements is essential. The Wales Coastal Groups Forum should directly engage the

Recommendations
National Access Forum and proposed independent Access Reform Group, to discuss how access reforms may better support and enable coastal adaptation. 15. 'Difficult conversations' need to be taking place today. There is a moral responsibility to actively engage communities and other stakeholders now about the future of their coastline. Community engagement requires a *sustained* dialogue, supported by sufficient resources and training of staff on the ground. All RMAs and Coastal Erosion Risk Management Authorities should actively engage local communities in a consistent, honest, clear and transparent way while recognising the need for sensitive and compassionate language. 16. Communities should be placed at the heart of adaptation planning and play a key role in determining their future. Empowering local communities to become actively involved in FCERM and adaptation planning will require *meaningful engagement* (not consultation) in order to establish a shared understanding of local risks and adaptation needs, while creating space for different options for the future/adaptation pathways to be discussed. Further research is needed to explore alternative, creative approaches to diversify the engagement 'toolkit', and explore how these may be appropriately tailored to suit different place needs, as well as reflecting the vibrancy of Welsh culture and the Welsh language. 17. "Just transitions" are vital - there is a need to better embed the principles of justice within adaptation discourse in FCERM. It is recommended that the Flood and Coastal Erosion Committee consider the issue of 'just transitions' and potential pathways through which ongoing scrutiny might be provided, such as the creation of a Flood Just group or opportunity to integrate adaptation matters within the proposed Climate Just advisory group. 18. The long-term adjustment and potential relocation of critical infrastructure will have significant impacts for maintaining well-connected communities. Network Rail should conduct a strategic assessment of the Wales Route to identify vulnerable infrastructure and should be actively involved in Coastal Groups and Public Service Boards to ensure the well-being implications, and impact to other services, are understood. At the UK scale, there is a need for a high-level debate about the remit of Network Rail funding and its strategic consideration of climate change adaptation.
Ecosystem Resilience
19. Area Statements have the potential to increase opportunities for co-delivering FCERM projects and delivering schemes with flood-related benefits through alternative funding sources. However, it will be important to monitor and evaluate the extent to which Area Statements, once adopted, perform as intended. 20. Resources to support periodic monitoring of area-based approaches will be essential to establish evidence and confidence in new approaches. However, the lack of evidence should not be a barrier to trialling experimental approaches – opportunities to experiment, innovate and learn are essential for enhancing capacities to adapt to future change. 21. Coastal squeeze presents a significant threat to intertidal habitats and the integrity of the Natura Network; however, the delivery of compensatory habitat through the National Habitat Creation Programme (NHCP) is notoriously complex and faces numerous barriers related to working with multiple landowners (with different priorities, planning horizons and remits of

Recommendations
responsibility); navigating legal duties to maintain public rights of way and duties of care; reputational risks; and lack of awareness of the implications of SMP2 amongst land/asset owners. In order to keep pace with sea level rise, these barriers will need to be overcome by – a) continued proactive engagement with landowners and service providers to identify potential sites for compensatory habitat early on; b) continuing to promote exception clauses for inviting non-Risk Management Authorities to participate in the NHCP; and c) addressing Recommendations 10, 12, 14 & 18.
FCERM, land-use management and land-sea integration:
22. The significant weaknesses in Technical Advice Note 15 ('*Development and Flood Risk*') are largely addressed through the proposed changes outlined in the current consultation of TAN 15 ('*Development, flooding and coastal erosion*'); subject to acceptance, these changes will offer better integration across terrestrial and coastal systems. Some potential gaps exist in relation to the development of Strategic Flood Risk Assessment – for instance, engagement with Coastal Groups should be explicitly encouraged in order to better bridge coastal management and spatial planning, and strengthen the role of spatial planning in adaptation efforts. Moreover, the Welsh National Marine Plan should be cited and referred to as a source of evidence, to further join-up thinking across the land-sea interface. 23. Periodic monitoring of the newly-implemented SuDS Approval Bodies (SABs) is essential to ensure their effectiveness is optimised to address surface water risks. 24. Further research is required into appropriate mechanisms for promoting behavioural change and the uptake of property-level resistance and resilience measures, looking across potential mechanisms within FCERM, spatial planning, building regulations and insurance sectors for example. 25. Opportunities for collaborative working, both within/between Risk Management Authorities and other stakeholder groups, should be sought where possible to promote integrated approaches to water management at the catchment/area scale through which multiple benefits can be delivered. 26. It is vital that efforts to join-up thinking across the land-sea interface continue – The review process of the Welsh National Marine Plan and the Marine Planning Decision Makers Group should be used to support this and address common challenges through whole system thinking. There is a need to address resource and funding gaps in order to support coordination across marine and terrestrial planning.
Strengthening the alignment between FCERM and Well-being agenda
27. Push and pull messaging - There is a need for the FCERM community and National FCERM Strategy to better articulate the wider well-being benefits of their activities to attract engagement from others. In turn, this can help unlock opportunities to deliver FCERM benefits through other schemes. 28. Public Service Boards (PSBs) have the potential to play an important part in FCERM governance and facilitate joined-up working. However, the extent to which flooding (and climate change adaptation more widely) has been embraced by PSBs is *ad hoc*. More effort is required

Recommendations
to raise the profile of FCERM within PSBs and local well-being plans. NRW as a statutory member of PSBs could facilitate this. Moreover, at the national scale, climate change adaptation should be included as a strategic priority within the Future Generations Commissioner's priority areas, in order to promote its inclusion in well-being planning at the local scale. 29. Efforts should be sustained (and promoted further) within the FCERM community to support the education of children and young adults, to enhance awareness of flood and coastal erosion risks, and climate change more broadly, and also help promote a sense of global responsibility. 30. To support healthy communities, there is a need to raise awareness of the lasting health effects of flooding. However, beyond 'treating' the impact of floods, there is a need to proactively support communities living with risk and uncertain futures in their personal resilience and emotional well-being. The communication of SMP policy changes should be sensitive to this and RMAs should identify where health and social care services, or voluntary groups, might assist the communication process and provide additional support to local communities. Moreover, FCERM should consider where nature-based approaches have the potential to support mental and physical health benefits associated with blue-green spaces, and, in turn, support preventative health care initiatives. 31 The national well-being indicators give a limited picture of fluvial and coastal flood risk, only, focused on numbers at risk. Consideration should be given as to whether there is a need to expand this to include other sources of flood risk, as well as information on the scale of coastal change highlighted by SMP2 policies, given that coastal change presents a significant threat (and potential opportunity) for national well-being. 32. There is a need to think creatively about how FCERM activities might help support and enhance Welsh language skills (e.g. through education pathways), and link to local community initiatives, which may simultaneously help to foster social capital and support community resilience to flooding. 33. In order to ensure the sustainable management and preservation of cultural heritage in the face of coastal change, there is a need to strengthen alignment between the historic environment and FCERM communities. In the first instance, the relationship between the two should be more strongly articulated within the National FCERM Strategy to provide a strategic steer for action on the ground. 34. It is essential that well-being policy and associated governance mechanisms are given time to mature, through learning-by-doing.

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Abbreviations

ASC	Adaptation sub-committee of the Committee on Climate Change
CAP	Common Agricultural Policy
CaRR	Communities at Risk Register
CCC	Committee on Climate Change
CCRA	Climate Change Risk Assessment
CRMP	Coastal Risk Management Programme
DAM	Development Advice Map
DCWW	Dŵr Cymru Welsh Water
Defra	Department for Environment, Food and Rural Affairs
EAP	Economic Action Plan
FCA	Flood Consequence Assessment
FCERM	Flood and Coastal Erosion Risk Management
FRM	Flood Risk Management
IROPI	Imperative Reasons of Overriding Public Interest

LLFA	Lead Local Flood Authority
LDP	Local Development Plan
LPA	Local Planning Authority
NFM	Natural Flood Management
NHCP	National Habitat Creation Programme
NRW	Natural Resources Wales
PAC	Public Accounts Committee
PSB	Public Service Board
PRoW	Public Rights of Way
RMA	Risk Management Authority
SAC	Special Areas of Conservation
SDP	Strategic Development Plan
SFCA	Strategic Flood Consequence Assessment
SMNR	Sustainable Management of Natural Resources
SMP	Shoreline Management Plan
SoNaRR	State of Natural Resources Report
SPA	Special Protection Area
SuDS	Sustainable Urban Drainage Systems
WCMC	Wales Coastal Monitoring Centre
WCGF	Wales Coastal Groups Forum
WLGA	Welsh Local Government Association
WNMP	Welsh National Marine Plan

1 Scope of this report

Rising sea levels and climate change projections mean difficult decisions need to be made about how best to manage our coastlines – this entails balancing the need for sustainable Flood and Coastal Erosion Risk Management (FCERM) and the preservation of well-being in at-risk communities. In Wales (UK) this is further reinforced by the *Well-being of Future Generations (Wales) Act 2015* and the associated commitment to seven national Well-Being Goals set out in the Act. These goals reflect the economic, social, environmental and cultural facets of well-being, including *prosperity, resilience, health, equality, cohesive communities, culture and language*, and *global responsibility*. However, while there are a wide range of opportunities for embedding well-being into FCERM policy and practice, the aspirations underpinning this recent legislation also pose a number of barriers and challenges.

Focusing on the relationship between FCERM and well-being, this research addressed three pivotal questions:

I. What are the current strengths and weaknesses in FCERM governance in Wales?
II. What are the synergies/opportunities and conflicts/challenges for aligning FCERM governance with the Welsh well-being agenda and national well-being goals?
III. In what ways could FCERM be better aligned and coordinated with the national well-being agenda through multi-level governance?

To address these questions, this research employed a mixed methods approach. We carried out an in-depth policy and legal analysis of approximately 200 documents, including all current (or recently closed) consultations **published before 10th October 2019**. This analysis was accompanied by 47 interviews (between December 2018 and September 2019), with policymakers and practitioners operating at national and local scales in Wales. The results were then further validated through a stakeholder workshop held in July 2019. This report presents the outcomes of this analysis and provides in-depth insight into the current state of affairs in Wales, reflecting critically on the implications of current FCERM governance upon the well-being of current and future generations to come.

Firstly, we provide an overview of the Welsh context (Section 2) and then explain the research methodology (Section 3). In Section 4, we discern numerous strengths and weaknesses in current governance, before addressing each well-being goal in turn in Section 5, where we identify the various opportunities and challenges for aligning FCERM with the well-being agenda. Based on this analysis, we identify recommendations for policy, practice and research needs for the future in Section 6. To help guide the reader, '*key learning points'* are highlighted in information boxes throughout this report, alongside key summary tables (Table 4.5 and Table 5.1).

The research was performed as part of the interdisciplinary project "CoastWEB" (2016-2020)[1], which examines the contribution that coastal habitats make to human health and well-being in Wales, with a particular focus on the alleviation of coastal hazards and extreme events. For further information on the broader goals of the project the reader is referred to https://www.pml.ac.uk/CoastWeb/Home.

2 Contextual background

This section provides the necessary contextual background for understanding FCERM governance in Wales. We firstly provide an overview of the administrative structure and political context for those not familiar with the Welsh setting, followed by a brief account of the national well-being agenda and general overview of FCERM governance.

2.1. Administrative structure

As a devolved administration of the UK (*Government of Wales Act 1998*), Wales has autonomy for certain aspects of devolved public policy (including the environment), while other matters are reserved for UK Government (Schedule 7A of the *Government of Wales Act 2017*). Devolved matters are overseen by the Welsh Government (currently Labour-led), which consists of The First Minister, Welsh Ministers (the appointed cabinet), The Counsel General (the Law Officer for the Welsh Government) and Deputy Ministers, supported by the civil service. The National Assembly for Wales (commonly referred to as the Welsh Assembly) is the national parliament, comprised of democratically elected Assembly Members. The Welsh Assembly acts as the legislator and has legislative powers to establish Assembly Measures (i.e. primary legislation) in matters where it has legislative competence to effect change in Wales (*Government of Wales Act 2006*, as amended). Furthermore, 15 Committees are in place to scrutinise expenditure, policies and proposed legislation, and ensure accountability.

The Welsh Government is funded by the UK Government according to the budget set out in the Spending Review and adjusted through the Barnett Formula[2] (see Auditor General for Wales, 2018). The UK Government's current Spending Review settlement sets the Welsh

[1] CoastWEB is part of the Valuing Nature Programme - a 5 year (2014-2019) £6.5m initiative funded by the Natural Environment Research Council, Economic and Social Research Council, Arts & Humanities Research Council, the Biotechnology and Biological Sciences Research Council and Defra.

[2] Adjustments to the Welsh budget are determined through the Barnett formula and applied to the Welsh baseline budget. The formula reflects changes that the UK government makes and applies them to comparable budgets in Wales.

Government's revenue budget for the period 2016-17 to 2019-20 and the capital budget until 2020-21[3]. Funding is transferred through the Wales Office and the Secretary of State for Wales, and allocated to the Welsh Government, Assembly Commission, the Wales Audit Office and the Public Services Ombudsman by the Welsh Assembly.

Welsh Government's spending proposals for the financial year ahead is approved by the Welsh Assembly following the scrutiny of the Finance Committee and corresponding subject committees, before being redistributed across Welsh Government, local government and other public bodies. As of the 1st April 2018, Wales is also able to raise a proportion of its own revenue to support public services through the introduction of two new devolved taxes, land transaction tax and landfill disposal tax, which replace UK Government stamp duty land tax and landfill tax, respectively (under the *Wales Act 2014*) (for further details see Auditor General for Wales, 2018).

The allocation of the Budget is guided by strategic priorities outlined in public policy, to which this discussion now turns.

The relationship with the European Union

Following the European Union membership referendum on 23rd June 2016, the *European Union (Withdrawal) Bill* obtained royal assent on the 26th June 2018 and has since been enacted in the *European Union (Withdrawal) Act 2018*. The Act repeals the *European Communities Act 1972* and outlines provisions for the UK's withdrawal from the EU (colloquially referred to as "Brexit"). This includes provisions for retaining EU-derived domestic legislation, where it is stated that "*EU-derived domestic legislation, as it has effect in domestic law immediately before exit day, continues to have effect in domestic law on and after exit day*" (Section 2(1)). Assisting this transition, the Welsh Government has established a Cabinet Sub-Committee for EU Transition.

Wales is a net beneficiary of EU membership and receives ca. £680m in EU funding per year (Welsh Government, 2017a). This is mostly derived through the European Structural and Investment Fund (ESIF), which includes the European Regional Development Fund (ERDF), the European Social Fund (ESF) and the European Agricultural Fund for Rural Development (EAFRD). ESIF facilitates a range of initiatives to support social and economic development in

[3] The 2018-19 budget marks the first time when Wales is able to raise a proportion of its own revenue to support public services. This is made possible through the introduction of two new devolved taxes, land transaction tax and landfill disposal tax, which replace stamp duty land tax and landfill tax respectively.

slow-growing regions, providing over £2bn of investment between 2014 – 2020 across Wales (Welsh Government, 2017a). Common Agricultural Policy (CAP) further supports the rural economy, alongside the protection of the countryside and sustainable management of natural resources, providing ca. £274m each year in direct subsidiaries to ca. 16,000 farms in Wales (Welsh Government, 2017a).

In light of Brexit uncertainty, Welsh Government produced a White paper, "*Securing Wales' Future*" (Welsh Government, 2017a), which sets out the key strategic areas, priorities and transition plan in preparation for the UK's exit from the EU. A particular concern is the loss of the EU regulatory framework which underscores a vast body of current social and environmental legislation. A commitment is also made to maintain current standards in respect to air and water quality, emissions and environmental protection, as well committing to the principle of 'green growth', movement towards a circular economy and sustainable management of natural resources (Welsh Government, 2017a: 29).

Welsh Government has further outlined a vision for *"Regional investment in Wales after Brexit*" (Welsh Government, 2017b), whereby Brexit is recognised as both a challenge and "*opportunity to work more systematically with functional regional areas… rather than being constrained by the current geographical and fund-specific limitations*" (p14). In this sense, Brexit is framed as an opportunity for realigning funding to suit a more regional approach, delivered through new partnerships, innovation and linking policy in 'imaginative ways' (Welsh Government, 2017b).

The loss of EU funding presents both challenges and opportunities for the future. These are discussed in this report, where relevant to FCERM and well-being agendas.

2.2. Wider policy context

A new legislative portfolio

In performing this research, we took into account the wider strategic aims of Welsh Government and current policy trajectories. In 2015/16 a new legislative portfolio was introduced in Wales. These are summarised in Table 2.1. The implications of these Acts for Flood & Coastal Erosion Risk Management (FCERM) are discussed where relevant throughout this report.

Table 2.1: Overview of recent legislation in Wales (also see McKinley et al., 2018)

Key legislation	Summary
Well-being of Future Generations (Wales) Act 2015	Places a well-being duty on public bodies to contribute towards 7 national well-being goals. Establishes the role of the Future Generations Commissioner and formation of Public Service Boards. Public bodies must act in accordance with the sustainable development principle and Five Ways of Working.
Planning (Wales) Act 2015	To ensure resilient planning in line with sustainable development. Strengthens a plan-led approach, including provision for the production of Strategic Development Plans. Introduced a legal framework for Welsh Ministers to prepare a National Development Framework for Wales. The Act also introduces a requirement for formal pre-application discussions with statutory consultees for certain development types; this includes NRW for certain developments proposed in Flood Zone C.
Environment (Wales) Act 2016	Mandates for the Sustainable Management of Natural Resources (SMNR) (based on 9 principles), delivered through a new policy framework comprising – a State of Natural Resources Report (SoNaRR) (to be published every 5 years and produced by NRW); Natural Resources Policy (to be produced by Welsh Ministers); and Area Statements to provide the evidence-base at the local scale (to be produced by NRW). The act further places a Biodiversity and Resilience of Ecosystems Duty (Section 6 Duty) on public authorities. The Act also establishes statutory emission reduction targets and the formation, and remit, of the Flood & Coastal Erosion Committee.

Programme for Government – Taking Wales Forward

It is also important to understand FCERM within the context of other Governmental priorities. *Taking Wales Forward* establishes the Programme for Government (2016 to 2021) and organises priorities into four key overarching ambitions for Wales – i) prosperous and secure, ii) healthy and active, iii) ambitious and learning, and iv) united and connected (Welsh Government, 2016c). To achieve prosperity and security, Welsh Government outlines a number of environmental commitments, including climate change mitigation and a commitment to '*continue to invest in flood defence work and take further action to better manage water in our environment'* (Welsh Government, 2016c: 6).

Prosperity for All

The Programme for Government is further cemented in *Prosperity for All: the national strategy*, which contextualises Welsh Government's commitments in relation to wider public policy and service delivery. Here, prosperity is not simply taken to mean material wealth or economic growth but is framed in the broadest sense in terms of '*good quality of life and living in strong, safe communities*' (Welsh Government, 2017c). Well-being objectives are established for each of the key ambitions outlined in Taking Wales Forward (Figure 2.1).

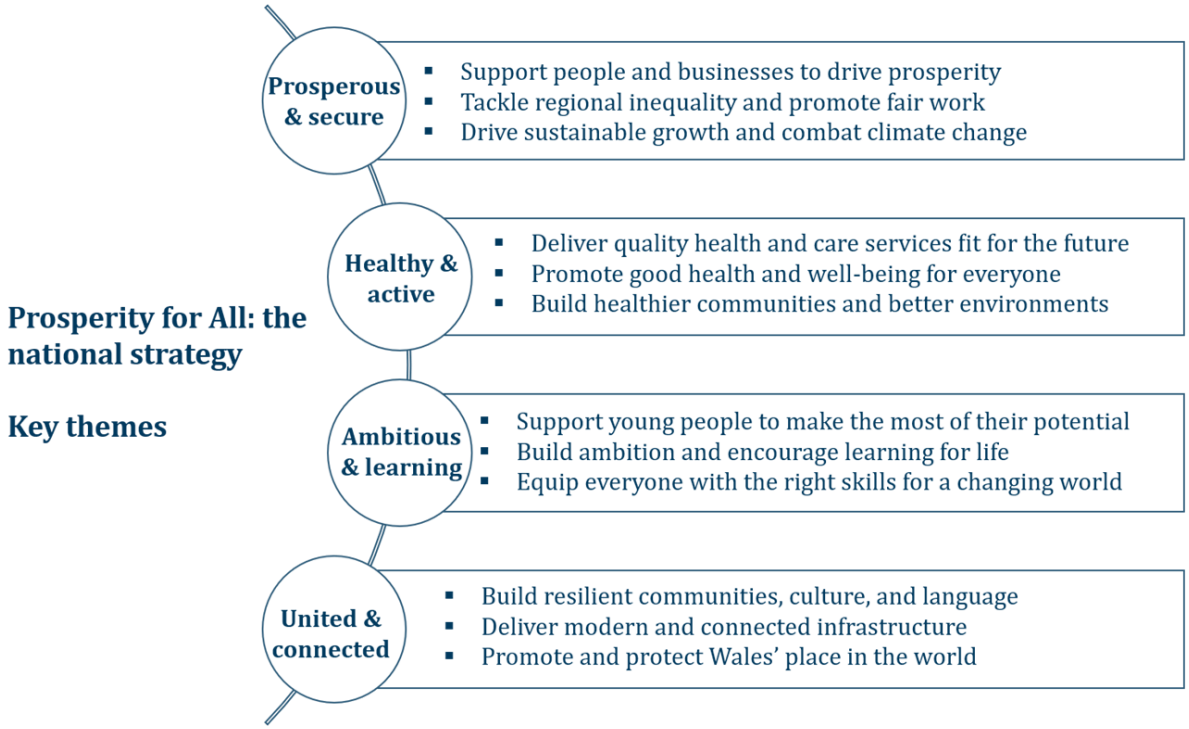

Figure 2.1: Overarching ambitions and well-being objectives outlined in Prosperity for All: the national strategy (adapted from Welsh Government, 2017: 6)

The national strategy is rooted in the 'new ways of working' mentality, enshrined through the *Well-being of Future Generations (Wales) Act 2015* and specifies the importance of integrated, collaborative and preventative approaches. Five priority areas are identified as having the greatest potential to deliver this vision, through early intervention and cross-government working; these include i) early years, ii) housing, iii) social care, iv) mental health, and v) skills and employability (Welsh Government, 2017d). These priorities are further supported in *Prosperity for All: the Economic Action Plan* (EAP) (Welsh Government, 2017c).

It is useful to observe the key discourses that shape the economic action plan. This includes calls for inclusive growth, fairness and reduced inequalities; strategic and collaborative partnerships ("participation for all"); public investment with a social purpose; and a strong regional steer for economic development. In order for businesses to access direct financial support, Welsh Government has introduced the notion an Economic Contract and Calls to Action, as part of a 2-step process (Welsh Government, 2017c). These essentially aim to redefine the relationship between Government and business "*as partners for inclusive growth*" (Welsh Government, 2017c: 9), thus shifting the relationship from one of "*coexistence to collaboration*" (p10). Through the Economic Contract, businesses are expected to contribute to Welsh Government's wider objectives, including i) growth potential, ii) fair work, iii) health promotion and iv) reducing the carbon footprint. In Step 2, business must be able to demonstrate their contribution to at least one of the five *Calls to Action* – decarbonization;

innovation, entrepreneurship and headquarters; exports and trade; high quality employment, skills, development and fair work; and R&D, automation and digitalization. Successful applications will receive funding through a consolidated Economy Futures Fund. It is important to remain cognisant of what these Calls to Action represent and what they reveal in terms of understanding what Welsh Government perceives to be the pillars of prosperity.

The economic action plan further outlines a vision for delivering a regionally-focused model of economic development through new economic regions (aligned to those used by local government collaborations and Regional Skills Partnership) – namely, North Wales, Mid and South West Wales, and South East Wales. In addition to new business, the economic action plan also recognises the important role of so-called foundation sectors – namely tourism, food, retail and care – as well as the need to widen cross-government initiatives. The latter is particularly relevant for understanding FCERM and how it may align to wider efforts to deliver cross-sectoral, multi-beneficial schemes.

Accompanying the existing suite of 'Prosperity for All' policies, in 2019 Welsh Government published *Prosperity for all: a low carbon Wales* (Welsh Government, 2019b). The plan[4] establishes the Government's approach for transitioning to a low carbon economy in order to meet the first carbon budget (2016 – 2020) and 2020 interim targets, as required under the *Environment (Wales) Act 2016* (Part 2, S39)[5]. The plan looks across 76 existing policies in Welsh and UK Governments and the EU, while also putting forward 24 proposals for moving forwards. Decarbonisation is a clear priority. This was further reinforced on the 29th April 2019 when Welsh Government formally declared a Climate Emergency and committed to achieving a carbon neutral public sector by 2030.

Forthcoming changes

This section has sought to summarise some of the key policies and emerging discourses in Wales. However, it is also important to emphasise the ongoing dynamic nature of public policy and considerable number of current and forthcoming consultations and policy changes that are anticipated within the immediate future. These are outlined below (Table 2.2). For the purpose of this research, we have included all current (or recently closed) consultations published **before 10th October 2019**. Where possible, we have considered the potential impacts of proposed decisions and conferred with research participants; however, it is crucial to remain cognisant that future changes are highly likely to occur.

[4] The next plan 2021 – 2026 is currently being prepared and anticipated for 2021 to coincide with the next carbon budget.

[5] Part 2 of the Environment (Wales) Act 2016 specifies that Welsh Ministers must ensure that the net Welsh emissions account for the year 2050 is at least 80% lower than the baseline.

Table 2.2: Summary of forthcoming changes in policy and governance

Document	Consultation dates	Anticipated implementation
Welsh National Marine Plan	7th Dec 2017 – 29th March 2018	Published 12th November 2019
Climate Change Adaptation Plan for Wales	3rd Dec 2018 – 4th March 2019	Autumn 2019
Environmental Principles and Governance in Wales Post European Union Exit	18th March – 9th June 2019	
The Draft National Strategy for Flood & Coastal Erosion Risk Management in Wales	24th June – 16th Sept 2019	2020
Draft Development Plans Manual (Edition 3)	7th June – 30th August 2019	2020
National Development Framework 2020 - 2040	7th August – 1st November 2019	2020
Sustainable farming and our land	9th July – 30th October 2019	2020
Technical Advice Note 15: Development and Flood Risk	9th October 2019 – 17th January 2020	2020
UK Government		
Draft Environment (Principles and Governance) Bill 2018	Draft Bill published 19th December 2018, with an update in July 2019. Further consultations planned.	
Agriculture Bill	The Bill failed to complete its passage through Parliament before the end of the session. This means the Bill will make no further progress.	
UK's official exit from the EU		*Uncertain*

NOTE: The following documents were published after our analysis was completed and are therefore not included within this report – this includes the first *Welsh National Marine Plan*[6] and *Prosperity for All: A climate conscious Wales*[7].

[6] Welsh Government (2019) *Welsh National Marine Plan*. Published 12th November 2019.
[7] Welsh Government (2019) *Prosperity for All: A climate conscious Wales*. *A climate change adaptation plan for Wales*. Published 30th November 2019. WG37962.

2.3. The Well-being agenda

Novel legislation was introduced in Wales in 2015 to improve social, economic, environmental and cultural well-being in Wales and deliver the national vision for the *Wales We Want*[8] (Welsh Government and Cynnal Cymru, 2015). The *Well-being of Future Generations (Wales) Act 2015* is grounded on the core principle of sustainable development and is the key mechanism through which Wales will address the UN Sustainable Development Goals (UN, 2015). The Act embeds a long-term perspective within decision-making:

> "Sustainable development" means the process of improving the economic, social, environmental and cultural well-being of Wales by taking action, in accordance with the sustainable development principle, aimed at achieving the well-being goals. (Part 2, S2: p3).
>
> "…in accordance with the sustainable development principle means that the body must act in a manner that seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs" (Part 2, S5(1): p5).

The Act establishes a Well-being Duty on 44 individual public sector organisations[9] (Part 2, S3), requiring them to carry out sustainable development by setting and publishing well-being objectives to maximise achievement of each of the well-being goals, and to take 'all reasonable steps' to meet those objectives, in accordance with the sustainable development principle (Welsh Government, 2016j). To facilitate this, the Act introduces Five Ways of Working (Figure 2.2)[10].

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[8] In 2014 Welsh Government launched the *Wales We Want* initiative to facilitate a national conversation about the long-term future of Wales and help inform collectively-agreed goals within the *Future Generations Bill* (Welsh Government and Cynnal Cymru, 2015).

[9] Public bodies include Welsh Ministers; a local authority, a local health board; the following NHS trusts – Public Health Wales and Velindre; a National Park Authority for a national park in Wales; a Welsh fire and rescue authority; the Natural Resources Body for Wales; the Higher Education Funding Council for Wales; the Arts Council for Wales; the Sports Council for Wales; the National Library of Wales; the National Museum of Wales
.

[10] Note that there is no prescription on the length of time required for 'long-term' working, as this varies depending on the decision-making context; however, 25 years is outlined as a useful reference point for a generation, thus looking 25 years ahead is regarded as best practice (Welsh Government, 2016i).

Figure 2.2: The Five Ways of Working in accordance with the Sustainable Development Principle (Part 2(S5), the *Well-being of Future Generations (Wales) Act 2015*; adapted from Welsh Government, 2015a)

Public bodies must produce and publish the following:

- Well-being objectives based on the Five Ways of Working;
- A well-being statement to explain what actions will be taken to deliver these objectives;
- An annual report to document progress on well-being objectives[11];
- Response to any recommendations made by the Future Generations Commissioner or Auditor General for Wales.

The Act (Part 4) specifies the formation of **Public Services Boards** (PSBs). This represents a new statutory mechanism for collaboration at the local authority scale (Welsh Government, 2019i). Each PSB is comprised of representatives from the Local Authority (LA), Local Health Board, Fire and Rescue Authority and Natural Resources Wales (NRW). A duty is also placed

[11] Public bodies were required to publish their first annual progress report (2017/18) by 31st March 2019.

on these formal board members to invite participants (referred to as 'invited participants'), including Welsh Ministers, Police (namely the Chief Constable and Police and Crime Commissioner) and Probation services, as well as at least one body representing voluntary organisations, and any other person who exercises functions of a public nature.

A collective well-being duty is placed on each PSB, requiring them to conduct an assessment of local well-being to determine the current state of well-being of the PSB's community areas and its people, as well as forming predictions on future well-being trends (C2, S37; also see Welsh Government, 2016k). This assessment must take into account the UK Climate Change Risk Assessment[12], alongside other relevant reviews related to the sufficiency of nursery education, childcare and play opportunities[13], and other recent strategic assessments related to i) needs for care and support, and support for carers and preventative services[14], ii) crime and disorder[15], iii) combating substance misuse, iv) reduction of reoffending, and v) any other review or assessment in relation to local authority areas.

Based on the local well-being assessment, PSBs must produce **Local Well-being Plans** in consultation with key stakeholders (see Chapter 2, 38(1)). This must include local well-being objectives and steps to meet these objectives (whether by one or more board members, invited participants or other partners acting jointly), alongside a specified time period for achievement. A PSB must produce annual progress reports[16] to specify the steps taken to meet the objectives set out in the plan (S45). Both assessments and plans must be subject to consultation (for a period of 12 weeks) and subsequently sent to the Welsh Ministers, the Commissioner, the Auditor General for Wales and the local authority's overview and scrutiny committee. Statutory consultees are outlined in Chapter (S38 and S43). The latest Well-being Plans for each of the 19 PSBs have been published for the period 2018 – 2023.

In addition to the annual reporting expected of listed public bodies, Welsh Ministers must also publish a "**Future Trends Report**" (Part 2, S11) in the period of 12 months beginning with the date of a general election. The report must contain predictions of future well-being trends and take into account the UK Climate Change Risk Assessment and any action taken by the UN with regards to the UN Sustainable Development Goals. The first Future Trends Report was

[12] As produced under section 56(6) of the Climate Change Act 2008
[13] Produced (in order) under the School Standards and Frameworks Act 1998, the Childcare Act 2006 and the Children and Families (Wales) Measure 2010
[14] Produced by the Local Authority and Local Health Board under the Social Services and Well-being (Wales) Act 2014.
[15] Produced under Section 6 of the Crime and Disorder Act 1998
[16] The first progress report must be published no later than 14 months after publication of the Local Well-being Plan and twelve months thereafter.

published in 2017 and identifies key trends across 6 themes – including population, health, economy and infrastructure, climate change, land use and natural resources, and society and culture (Welsh Government, 2017f).

While public bodies are responsible for setting their own objectives, these are scrutinised by the newly created **Future Generations Commissioner** (Sophie Howe) and the Auditor General for Wales. The Future Generations Commissioner for Wales has a general duty to promote the sustainable development principle and encourage public bodies to take greater account of the long-term impact of their activities; thereby acting as '*a guardian of the ability of future generations to meet their needs*' (Part 3, S18). The Commissioner must monitor and assess the extent to which well-being objectives are being met (S18), but also has the capacity to provide advice or assistance in relation to well-being objectives, the sustainable development principle and PSBs, in their preparation of Local Well-being Plans. Furthermore, the Commissioner has powers to encourage best practice and collaboration between public bodies (S19). In reviewing the well-being objectives set by public bodies, the Commissioner can give recommendations which public bodies must take all reasonable steps to follow, unless they can otherwise justify their decision or decide to take an alternative course of action. Before the end of each reporting period (i.e. the year before an Assembly election), the Commissioner must prepare and publish an assessment on the progress of public bodies and any improvements required to achieve the well-being goals; taking into account each annual well-being report, the future trends report and other relevant reports of the Auditor General for Wales. "*Well-being in Wales: the journey so far*" was published in May 2018.

The Commissioner has also established the '**Art of the Possible'** programme to illustrate potential opportunities (and existing examples of success) for embracing the legislation. The programme adopts a partnership approach, with Goal Conveners identified for each of the 7 well-being goals and an additional convener for the theme of 'involvement' (i.e. one of the five ways of working). These conveners represent a number of organisations and work jointly with the Commissioner's office, either in partnership or on secondment. As part of this work programme, a range of online resources and 'Journey Checkers' are provided to outline simple changes, or sources of inspiration for delivering the well-being goals, and a range of topic areas therein[17] (e.g. Future Generations Commissioner for Wales and Wildlife Trusts Wales, 2019).

To secure the well-being of future generations, **seven well-being goals** are outlined and represent desired well-being outcomes (Table 2.3). Public bodies are required to demonstrate

[17] Art of the Possible and Journey Checkers can be accessed from https://futuregenerations.wales/the-art-of-the-possible/

equal consideration of these and maximise their contribution to the well-being goals; though it should be noted that the act does not define the level of contribution that should be made (Welsh Government, 2016i). Emphasis is placed on integrated (and non-hierarchical) nature of the well-being goals and application of the sustainable development principle where potential conflicts between goals might arise (Welsh Government, ibid). At the national scale, there are also 46 **national-level indicators**[18] to enable Welsh Ministers to monitor progress towards the achievement of the well-being goals. While the Act specifies that indicators can be measured quantitatively or qualitatively against particular outcomes (S10(2)), there is a clear dominance towards quantitative-based indicators (Welsh Government, 2016a). Nonetheless, the Act gives a legally-binding common purpose across public bodies to contribute to the achievement of the well-being goals (Welsh Government, 2016i).

Table 2.3: Seven well-being goals in Wales (as defined in the *Well-being of Future Generations (Wales) Act 2015*)

Well-being goal	Description
1. A prosperous Wales	An innovative, productive and low carbon society which recognises the limits of the global environment and therefore uses resources efficiently and proportionately (including acting on climate change); and which develops a skilled and well-educated population in an economy which generates wealth and provides employment opportunities, allowing people to take advantage of the wealth generated through securing decent work.
2. A resilient Wales	A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).
3. A healthier Wales	A society in which people's physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood.
4. A more equal Wales	A society that enables people to fulfil their potential no matter what their background or circumstances (including their socio-economic background and circumstances).
5. A Wales of cohesive communities	Attractive, viable, safe and well-connected communities.
6. A Wales of vibrant culture and thriving Welsh language	A society that promotes and protects culture, heritage and the Welsh language, and which encourages people to participate in the arts, and sports and recreation.
7. A globally responsible Wales	A nation which, when doing anything to improve the economic, social, environmental and cultural well-being of Wales, takes account of whether doing such a thing may make a positive contribution to global well-being.

[18] Further technical guidance on applying these indicators is also available and includes information on where data can be sourced, how it should be disaggregated by characteristics of the population and area (Welsh Government, 2016b)

The Future Trends Report (Welsh Government, 2017f) identifies the following key trends and concerns that are of particular relevance for this report:

- The population of Wales is projected to increase over the next 20 years by ca. 5%, including an increase in the population aged over 75 (from 9% in 2014 to 13% of the population in 2030);
- Overall life expectancies and 'healthy' life expectancies are increasing in Wales. However, there are significant differences between the most and least deprived;
- Mental illnesses have increased, with slight increases in obesity and diabetes, and likely increasing trends in other conditions in line with an aging population (such as dementia);
- The combination of the warming that has already occurred, together with at least some further warming (as projected), means further adaptation to climate change will be required (p9);
- Flooding poses the greatest long-term risk to infrastructure performance from climate change (p9);
- Many natural resources are continuing to decline (NRW, 2016):

We return to these points in later sections of the report when we examine the opportunities and challenges for better aligning FCERM and the well-being agenda.

2.4. Overview of FCERM in Wales

This section describes the necessary contextual background for understanding FCERM in Wales, before critically examining this in later sections of the report.

2.4.1. Flood risk and climate change

The latest UK Climate Projections for the 21st century (UKCP18) indicate milder, wetter winters and hotter, drier summers in the future, as well as increases in extreme events (Lowe et al., 2019). Moreover, under all emission scenarios, the frequency and magnitude of coastal flood risk is anticipated to increase, largely as a result of time-mean sea level rise. For Wales (Cardiff), sea level change for 2100 ranges from 0.27m – 0.69m (RCP2.6 scenario) to 0.51m – 1.13m (RCP8.5 scenario[19]), compared to the 1981-2000 average. Beyond 2100, sea level rise

[19] More information on the Representative Concentration Pathways (RCPs) can be found from https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-guidance---representative-concentration-pathways.pdf

is expected to continue under all UKCP18 greenhouse gas emission scenarios up to 2300 (Howard et al., 2019).

These projections have significant implications for society and long-term adaptation planning. Indeed, flooding and coastal change risks to communities, businesses and infrastructure have been identified by the Committee on Climate Change as a top priority for action (CCC, 2019). This concern is further mirrored in Welsh Government's draft *Climate Change Adaptation Plan*, which specifies that more action is needed to address flood risks to infrastructure and land management practices exacerbating flood risk, as well as identifying research priorities for understanding risks to communities, infrastructure and health and well-being from flooding (Welsh Government, 2018). At this point in time, the national Flood Risk Assessment Wales estimates that 245,000 properties are currently at risk of fluvial, coastal and surface water flooding, with coastal erosion affecting a further 400 properties along the 2,700km of Welsh coastline (Welsh Government, 2019a). However, these figures are likely to increase significantly under the influence of climate change and sea level rise (ASC, 2016).

In the meantime, significant flood events in recent years have served as a stark reminder of the current risks posed by flooding. The Winter 2013/14 floods saw 155 and 150 properties flooded in December and January respectively, with over 120 flood warnings issued in that period and the evacuation of 1,400 properties (NRW, 2014a). Significant disruption to rail and road networks was caused, alongside an estimated £8.1m of damages to publicly owned coastal defence structures. The floods also had a negative impact on the environment and affected 37 Sites of Special Scientific Interest (SSSI) and 10 Special Areas of Conservation (SAC). Although the costs of the Winter floods were significant, the properties flooded represented less than 1% of the total that were at risk; thus, avoided damages amounted to ca £960m and £2bn for December 2013 and January 2014, respectively (NRW, 2014). Nonetheless, 47 recommendations were identified to enhance FCERM in Wales (NRW, 2014b; 2015). Subsequent reports into the effectiveness of FCERM in Wales have similarly highlighted areas for improvement (Auditor General for Wales, 2016; Public Accounts Committee, 2017). With the frequency and severity of flooding likely to increase in the future, it is unsurprising that flooding and coastal change have been identified as a high priority for action (Welsh Government, 2016d; 2018; CCC, 2019).

2.4.2. Overview of roles and responsibilities

In Wales, FCERM governance is highly complex and involves the interaction across a range of public, (quasi) private and third sector actors, as well as civil society. Divisions of responsibility reflect different types of risk management activity, the nature of flooding (e.g. fluvial, surface water or coastal) and asset ownership. Formal Risk Management Authorities (RMAs) are identified in the *Flood and Water Management Act 2010*, including Natural Resources Wales (NRW), Lead Local Flood Authorities (LLFAs, referring to all 22 Welsh Local

Authorities), Highway Authorities and Water and sewerage companies. While NRW further maintains strategic oversight for all types of flooding, Welsh Government maintains overall responsibility and sets the strategic direction of FCERM through the publication of the National FCERM strategy[20].

A key point to emphasise is that there is no statutory duty to protect against flooding or coastal erosion, rather operating authorities exercise permissive powers. Ownership of defence assets is split (ca. one third each) between NRW, Local Authorities and private owners (i.e. 3rd sector assets). Therefore, private owners also have a responsibility for maintaining these assets; this typically includes landowners such as Crown Estate, National Trust and infrastructure providers (particularly Network Rail). Private citizens who are riparian landowners, also have duties established through common law. While riparian owners have the right to protect their property/land from flooding and erosion, they are legally required to use their property or land in a way that does not increase the risk of flooding to a neighbouring property/land (at the risk of a civil action; see Environment Agency, 2013a).

Under the *Coast Protection Act 1949* (as amended under Schedule 2 of the *Flood and Water Management Act 2010*), Coastal Erosion Risk Management Authorities (CERMA) have permissive powers to carry out coast protection works[21], in accordance with the national strategy and subject to the approval of NRW. In Wales, this role is shared by coastal local authorities and NRW. Therefore, some Local Authorities maintain the status of both LLFA and a CERMA.

Various statutory and non-statutory groups are also in place to facilitate different aspects of FCERM governance at national to local scales. The distribution of roles and responsibilities is summarised in Figure 2.3. Additional arrangements are in place for incident response, as summarised in a later section of this report (Figure 4.1). As of April 2015, NRW are also responsible for managing the water levels of all Internal Drainage Districts[22] (IDD) (once managed by Internal Drainage Boards), with the support of advisory groups (representing land occupiers and Local Authorities).

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[20] The second National Strategy for FCERM in Wales is currently under consultation (24th June – 16th September 2019) and will replace the first strategy (published in 2011).

[21] Coast protection works include a) anything done to construct, alter, repair, maintain or remove works; (b) anything done for the purpose of maintaining or restoring natural processes; (c) planting vegetation (as amended by the *Flood and Water Management Act 2010*).

[22] Internal Drainage Districts represent low-lying land where a particular need for water level management has been identified; the boundaries of which are determined by physical attributes and are operated in accordance with the *Land Drainage Act 1991* (as amended).

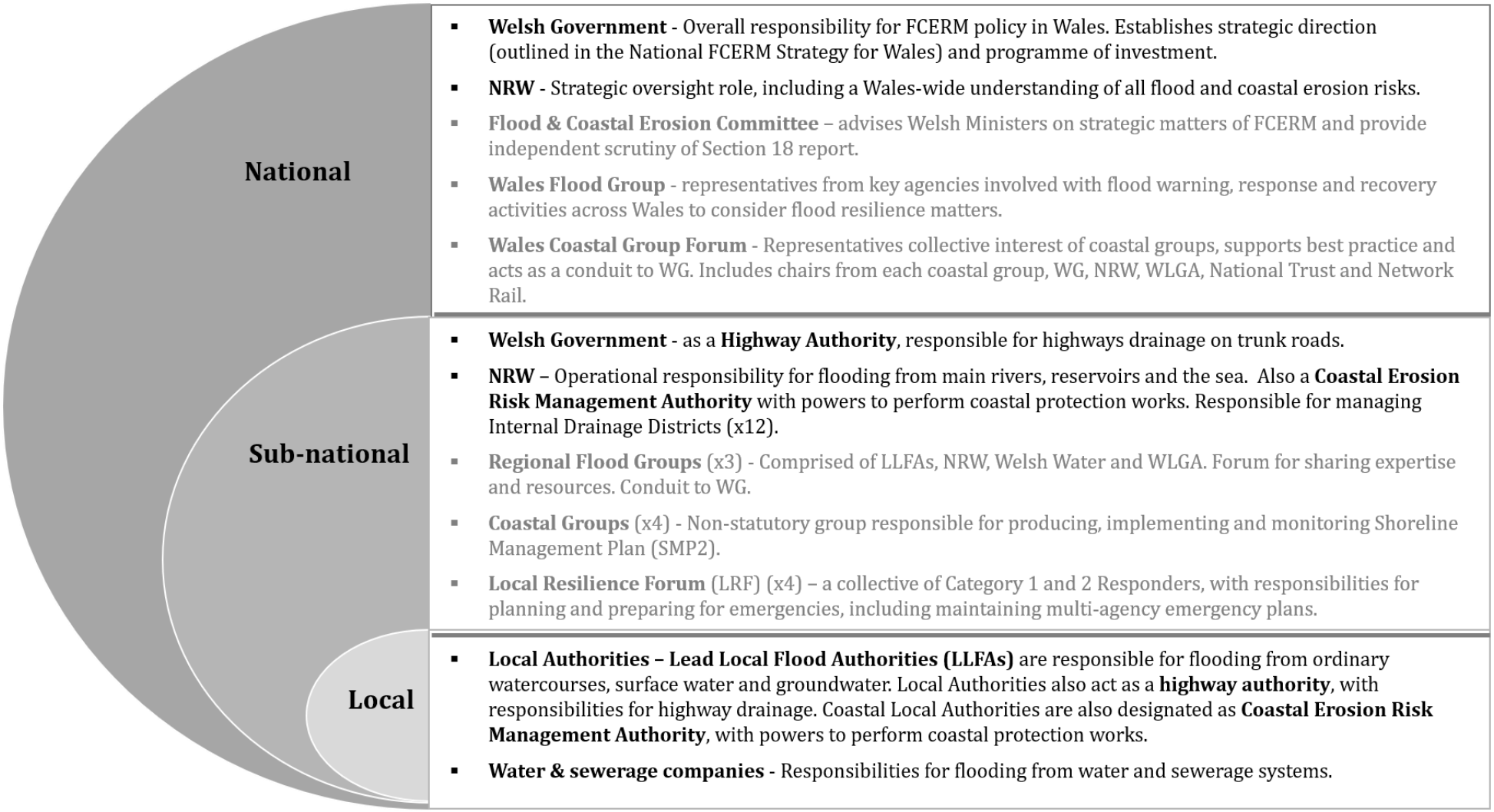

Figure 2.3: Overview of roles and responsibilities in FCERM governance in Wales, with key Groups and Committees (indicated in grey)

A holistic approach to FCERM has been established in the UK for several decades (Alexander et al., 2016) and means that governance arrangements are in place to minimise exposure, and the likelihood and magnitude of flood hazards, while also addressing the consequences of floods should they occur. These different types of strategies and activities are classified in Figure 2.4. Consequently, the activities in FCERM overlap several distinct (albeit related) areas of public policy, as illustrated in Figure 2.5.

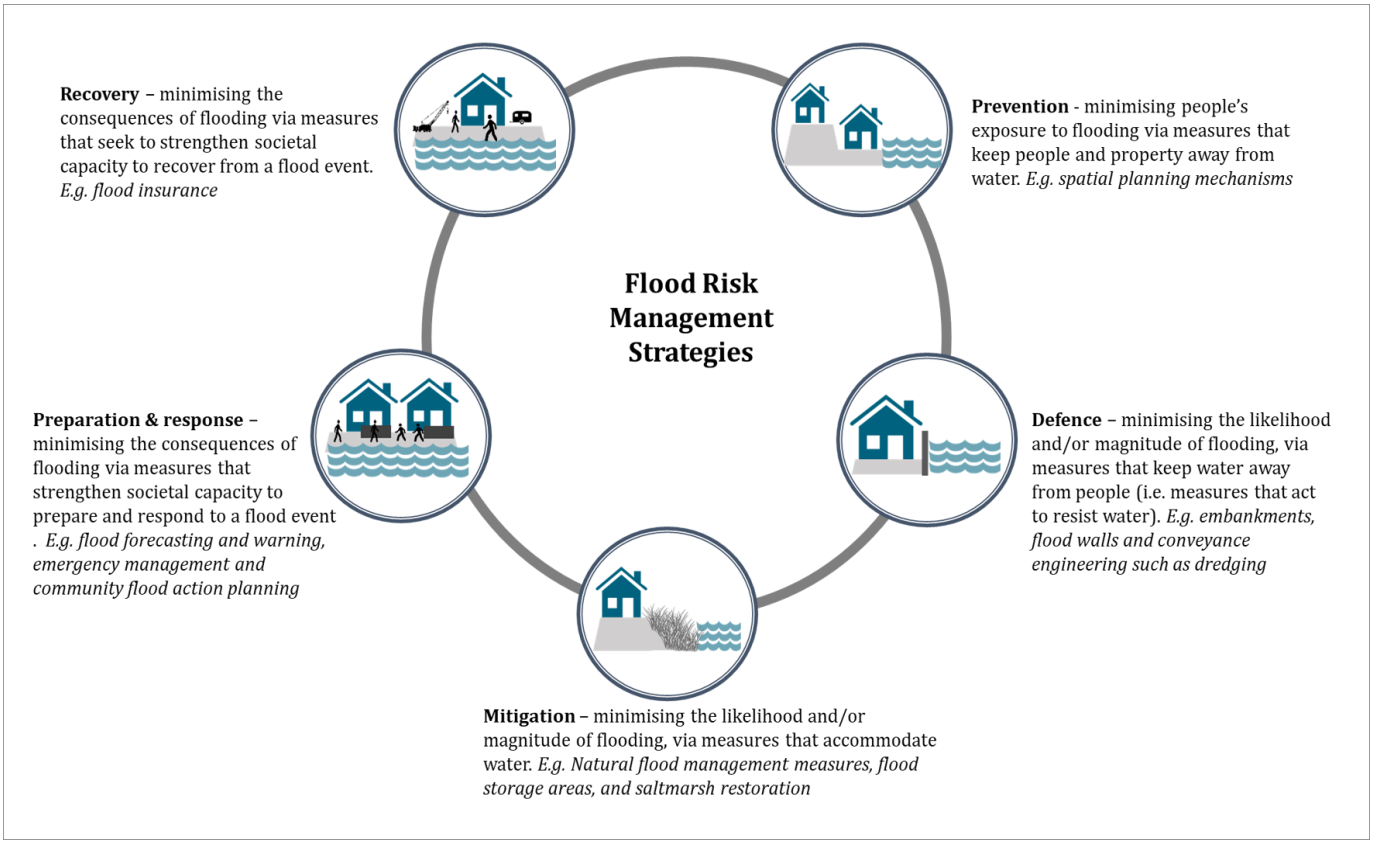

Figure 2.4: Different FCERM strategies established in Wales (adapted from the classification used by Hegger et al., 2014 and Alexander et al., 2016)

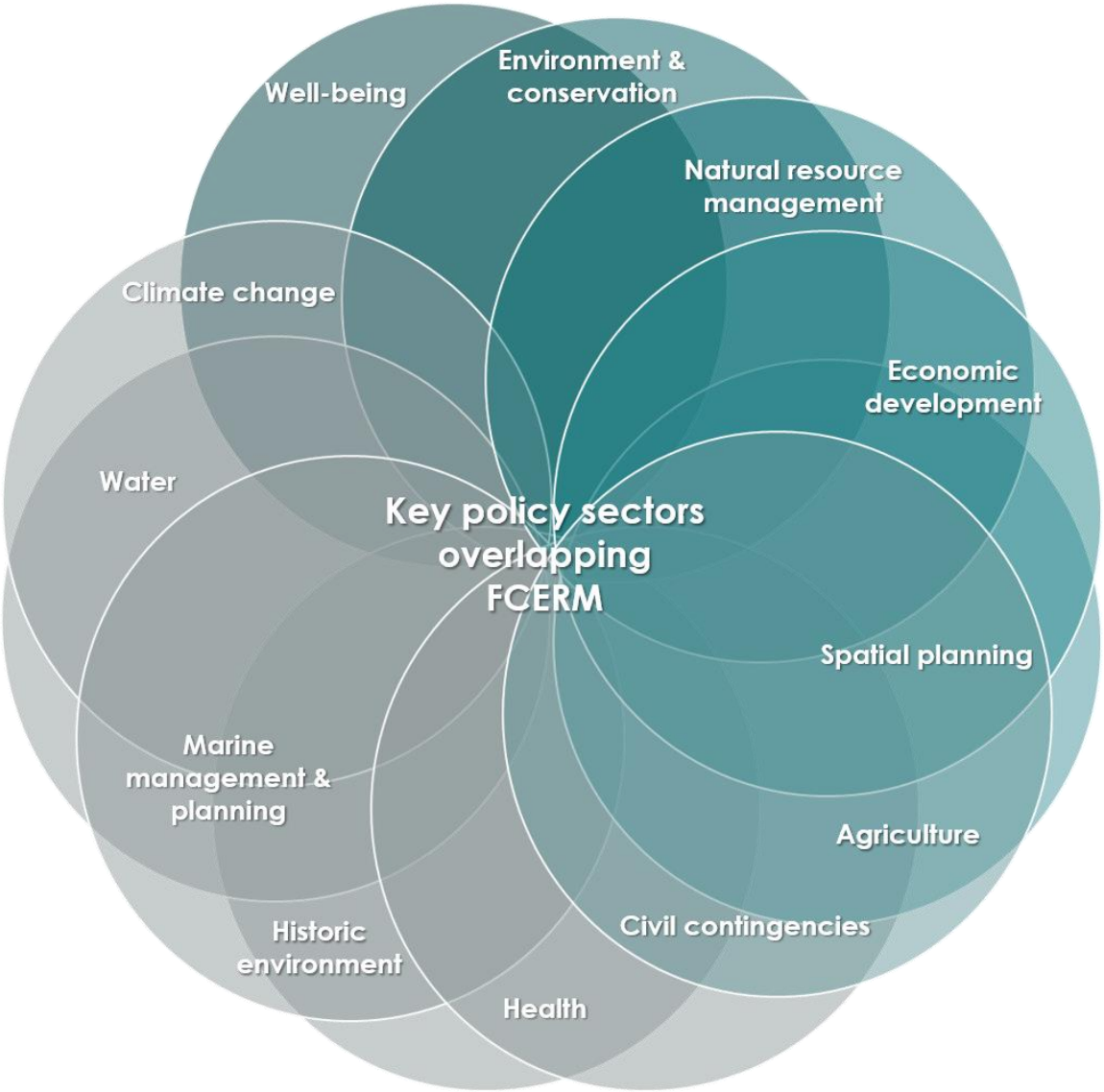

Figure 2.5: FCERM and key related policy domains

3 Research methodology

The research aimed to evaluate current FCERM governance in Wales, focusing in particular on the ways in which FCERM currently supports or conversely constrains the well-being of current and future generations to come. The project addressed three key questions:

I. What are the current strengths and weaknesses in FCERM governance in Wales?
II. What are the synergies/opportunities and conflicts/challenges for aligning FCERM governance with the Welsh well-being agenda and national well-being goals?
III. In what ways could FCERM be better aligned and coordinated with the national well-being agenda through multi-level governance?

The research essentially addressed two fundamental objectives; namely to i) identify and characterise governance arrangements and ii) evaluate current strengths, weaknesses, opportunities and challenges for integrating agendas for FCERM and well-being. Given the cross-sectoral nature of FCERM and well-being, data collection took place across a range of allied policy sectors (Figure 2.5). While the focus of the CoastWEB project is orientated towards the coast, this research examined all aspects of FCERM, from catchment to coast, and focused on coastal, fluvial and surface water flooding in order to provide a more holistic perspective. Moreover, in order to better understand the interactions between multiple levels of governance, we undertook both national and local-level analysis.

To identify and characterize governance we used the well-established Policy Arrangements Approach (PAA) (Arts et al., 2006). This approach provides a pragmatic framework for distinguishing one policy arrangement from another based on the four interdependent dimensions of actors, rules, resources and discourses; whereby a policy arrangement is understood as the '*temporary stabilisation of the content and organisation of a policy domain'* (Van Tatenhove et al., 2000: 54). The method has been adopted for the broader study of governance (where multiple policy domains may coincide) and for flood risk governance in particular (e.g. Hegger et al., 2014: Wiering et al., 2018). Indeed, governance is fundamentally concerned with the interaction across various actors (public, private and civil society) and the dynamics of *governing* in the realisation of collective goals (Lange et al., 2013). Such interactions, and the ability to achieve collective goals, are inherently shaped by various actors, rules, resources and discourses, which makes the PAA framework highly useful.

Several research methods were used to evaluate governance. Firstly, we performed an in-depth policy and legal analysis, drawing from a wide range of documents, from national-level strategies, policies and statutory legislation, through to consultation responses and meeting minutes. For the purpose of this research, we have included all current (or recently closed) consultations published **before 10th October 2019**. Approximately 200 documents were analysed in total (see Annex B). These were recorded in an Evidence Repository. Through text-based qualitative analysis we observed what and how things were stated, examining the strength of the wording and also noting what might be missing (see examples in Table 3.1).

Table 3.1: Determining the strength of wording

Strong phrases	Weak phrase
"we will not accept …"	"due regard to"
"all activities must address …"	"should incorporate"
"must demonstrate …"	"when / where appropriate"
"must comply…"	"encourage"
"all new developments will …"	"demonstrate due concern"
"all public bodies must act in accordance with…"	"will seek to develop"
	"preference towards"
	"give consideration to"

A total of 47 stakeholder interviews were carried out between December 2018 and July 2019. Interviewees included a range of representatives from various public bodies, as well as non-governmental organisations and third sector groups, operating at national to local scales. Interviews ranged in length from an hour to two and half hours. Over 55hours of interview recordings were transcribed (in anonymised form) and analysed in the qualitative data software package, NVivo[23]. An anonymous list of interviewees is provided in Table 8.1 (see Annex).

Finally, we hosted a stakeholder workshop on the 10th July 2019 at Cardiff University with key policymakers and practitioners - including representatives from Welsh Government, Natural Resources Wales, the Wales Flood & Coastal Erosion Committee, National Trust, Wales Coastal Monitoring Centre, Network Rail, local authorities, the Severn Estuary Partnership, consultancies and academics. There were 19 participants in total. The workshop provided an additional means of data collection and validation of existing findings to help inform recommendations for policy and practice (see Alexander et al., 2019).

To help guide the data analysis and synthesise research findings, we developed an evaluation framework based on a systematic literature review of ecosystem-based management and good governance principles more widely. The framework is comprised on 19 core criteria related to both process and outcome/impact aspects of governance (see Table 10.1).

4 Strengths & weaknesses in current FCERM governance

The following section is structured around core themes in FCERM and provides a commentary on the general strengths and weaknesses in current governance, based on a range of evaluation criteria (Table 10.1). **A full summary of the strengths and weaknesses is provided in Table 4.5.**

4.1. Strategic direction

The *Flood and Water Management Act 2010* requires Welsh Ministers to develop, maintain and apply a strategy for FCERM in Wales. The National Strategy for FCERM in Wales was published in 2011 and is currently being revised following a period of public consultation (24th June – 16th September 2019). While the revised strategy is still subject to change, it provides a valuable opportunity to compare the two and assess the trends and trajectory of FCERM

[23] Nvivo is produced by QSR International.

policy at the national scale. In addition, we also asked interviewees about their views on the strategic direction of FCERM more broadly, its appropriateness, and any perceived strengths or weaknesses, as well as their views on the proposed Strategy (where possible). This section reflects on the high-level strategic direction only; however, where relevant, specific aspects of the revised strategy (and measures therein) are considered in other sections of this report.

The first National Strategy (Welsh Government, 2011) emphasises the importance of a holistic risk-based approach to FCERM and diversification of strategies to minimise (rather than necessarily prevent) flood likelihood and magnitude, exposure and consequences of flooding and coastal erosion. In turn, FCERM is framed as a key activity in the Welsh government's efforts to '*ensure the well-being, safety and prosperity'*, and sustainability of Welsh communities (Welsh Government, 2011: Ministerial foreword). The emphasis on risk-based management (as opposed to traditional forms of flood defence) has continued and strengthened further in the second strategy. This is essential for addressing risk in a holistic way and supporting societal resilience (Alexander et al., 2016).

Table 4.1 compares the objectives between the two strategies. There continues to be an emphasis on understanding and communicating risk, prioritised funding, preparedness and response. However, building resilience and preventing further exposure to risks have emerged as explicit objectives. The inclusion of objective D (related to flood exposure) demonstrates the intention to strengthen the relationship between spatial planning and FCERM agendas; indeed, revisions to Technical Advice Note 15 ("*Development and flood risk*") have intentionally been made parallel to the FCERM Strategy and are also currently under public consultation (see Section 4.5). This is highlighted as a particular strength and crucial pathway through which FCERM will address the 'prevention' requirement of the Five Ways of Working (Figure 2.2).

Table 4.1: Comparison of objectives set out in the National Strategy for FCERM in Wales, 2011 and 2019

2011 Objectives	2019 objectives (*under consultation*)
I. Reducing the consequences for individuals, communities, businesses and the environment from flooding and coastal erosion; II. Raising awareness of and engaging people in the response to flood and coastal erosion risk; III. Providing an effective and sustained response to flood and coastal erosion events; IV. Prioritising investment in the most at risk communities	A. Improving our understanding and communication of risk; B. Preparedness and building resilience; C. Prioritising investment to the most at risk communities; D. Preventing more people becoming exposed to risk; E. Providing an effective and sustained response to events;

Another key policy trajectory relates to Natural Flood Management (NFM) and the ethos towards working with natural processes. It is made clear that investment will be prioritised towards the most at-risk communities, but equally that such investment will not necessarily

pertain to defences. Instead, NFM and hybrid approaches (including green-grey infrastructure) are actively promoted. This is further reinforced through the FCERM Business Case Guidance, which requires NFM options to be short-listed in the options assessment (Welsh Government, 2019c). Open access mapping data is available through the geo-portal for Wales[24], which identifies areas suitable for floodplain reconnection, run-off attenuation and gully-blocking, and woodland planting, to form the '*basis for starting conversations about NFM as a collaborative catchment-based approach'* (Welsh Government, 2019a: 45). Again, this is highlighted as a current strategic strength and one that is highly compatible with Natural Resource Policy and ecosystem resilience goals (discussed in Section 4.4).

However, adaptation is noticeably absent from the overarching list of national objectives. Within the Strategy itself, coastal adaptation is embedded within Objective D (preventing further exposure to risks), and the need for adaptive and sensitive coastal interventions, particularly where coastal defence would be unsustainable, is acknowledged. However, responsibility for 'considering' adaptation options is placed on RMAs, private asset owners and Coastal Groups. Building community resilience and adaptation planning are highlighted, yet there are no specific measures pertaining to these. Measure 16 commits Welsh Government to work with Coastal Groups and NRW to develop coastal adaptation guidance by 2021, which essentially reformulates previous commitments to develop a coastal adaptation toolkit (Welsh Government, 2016h; 2017k). Continued delays and slow progress in developing this guidance are discussed further in Section 4.3. The lack of adaptation-based measures and the omission of adaptation as an objective, gives the impression that adaptation is a lower Government priority. This was noted by numerous interviews and reflects a wider criticism of Welsh Government as lacking a sense of urgency when it comes to addressing future coastal change in particular. Certain interviewees, particularly at the local level, specified the need for stronger leadership from Welsh Government on these matters. The lack of references to adaptation were seen as a weakness of the strategy, with some emphasising the necessity for the Strategy to be more forward-looking and give greater consideration to future adaptive pathways – for example, one interviewee argued the need to "*move away from focusing on resilience and create an optimistic, bold and forward looking future linked to developing adaptive pathways*" (NFF).

The general wording used in the revised National FCERM Strategy can be further criticised from lacking assertiveness, with terms such as '*encouragement*' used throughout (e.g. in the context of NFM, the 5 ways of working, appropriate land management, wider well-being benefits and partnership funding etc.). From discussions with Welsh Government, it seems that there is a willingness to strengthen the wording where possible, but this is seen to be

[24] https://naturalresources.wales/flooding/managing-flood-risk/maps-for-natural-flood-management/?lang=en

constrained by the legislation and legal terminology – for instance, 'must' is regarded as a term that can only be used where there is a statutory duty to do something. However, language can be further reinforced through actions – or in this case, specific measures for addressing the overarching objectives. In this regard, the revised strategy tends to outline short-term measures (the majority of which strive for 2021/22), including measures which commit to investigating options (e.g. for NFM, see measure 12) or developing guidance for coastal adaptation (measure 16), rather than committing to implementation *per se*. This seems to reaffirm the criticism levied by some interviewees and previous inquiries (Auditor General for Wales, 2009) about the lack of urgency, leadership and long-term ambition of Welsh Government. There is clearly a need for pragmatism and clear measures to assess progress; indeed, the Auditor General for Wales called for more realistic targets in the revised National FCERM Strategy to address residual issues (Auditor General for Wales, 2016; Welsh Government, 2016h). However, this must be better balanced with longer-term ambitious measures, in order to maximise the strategic steering capacity of Welsh Government to its fullest potential.

Key learning points:

The emphasis on diversified risk-based management (as opposed to traditional forms of flood defence) has continued to strengthen and is essential for ensuring a holistic approach and supporting all facets of societal resilience.

There are calls to strengthen the strategic policy around coastal adaptation and approach adaptation with a greater sense of urgency. In its current form, the National FCERM Strategy appears to lack ambition for the future.

4.2. Funding arrangements

4.2.1. Strengths & weaknesses of current funding programmes

Funding for FCERM activities is provided in the form of capital (for new schemes) and revenue (which includes defence maintenance, coastal monitoring and community engagement activities). Two new funding programmes have been recently launched in Wales, both adopting a match-funding model.

The **Coastal Risk Management Programme** (CRMP) is a three-year capital programme from 2018-19 to 2020-21 and provides funding to LLFAs (only) for the purpose of coastal protection. Welsh Government has committed £150m to the programme and will fund 75% of proposed schemes, while the remaining 25% must be secured at the local scale through LLFAs, with potential input from external contributors. The Programme takes advantage of prudential

borrowing powers[25]; this essentially provides a loan to Local Authorities, through which Welsh Government supports repayments (up to 75% of costs). Whereas the former coastal protection grant was means calculated, CRMP establishes a flat-rate of grant support for councils, intending to offer a simpler approach (Wales Audit Office, 2016). The split in funding was justified by Welsh Government during the interview process, as follows:

> "there's good reason for having a 25% contribution and it helps to have some contribution because it gives ownership to local authorities. […] local authorities should always take into account what is good and what's good value for money and how it can help members of the public and how it should push other things forward but when you have that sort of financial input as well it just sharpens the mind a little bit more" (Welsh Government)

Funding is also available to both LLFAs and NRW through the four-year **Flood and Coastal Investment Programme** (2017/18 to 2020/21). This programme unites the former Grant in Aid (GiA) administered to NRW and coastal protection grant previously administered to LLFAs. Funding ratios differ from CRMP, with Welsh Government providing up to an 85% contribution to LLFAs towards fluvial and surface water schemes, and 100% funding for NRW (given their inability to raise revenue or capital, unlike local authorities).

This **match funding model** is distinct from the Partnership Funding model used in England, but nonetheless seeks to broaden and encourage alternative co-funding arrangements (Defra, 2011; Auditor General for Wales, 2016). In particular, broadening FCERM schemes to envelop wider benefits is seen as a crucial pathway for encouraging contributions from other actor groups. There is also a strong expectation that schemes protecting third-party assets or large business should endeavour to secure partnership funding. While Welsh Government remarked that the Partnership Funding model has been successful in securing additional funding, there remain some anxieties amongst Welsh Ministers about the potential for 'queue jumping' in certain locations (i.e. where it is easier to access partnerships and achieve more favourable cost-benefit ratios). This is something that Welsh Government intends to monitor over time, but crucially reveals a prominent theme in the interviews with Welsh Government about the importance of having a 'fair' system. Nonetheless, interviewees, including Welsh Government, reflected on the difficulty of negotiating this policy space and securing funding partnerships.

> "NRW obviously with the 100% funding, the partnership side of things is actually more difficult from them because there's less incentive for them to go looking, local authorities […] if they're a bit strapped for cash or resources you know they will want to go and try and seek financial contributions. […] So, it's a difficult

[25] Prudential Borrowing legislation from UK Government in 2003 gives local authorities the power to borrow money to fund capital projects

> policy space for us to try and use, is it a carrot or a stick, you know, we're trying to encourage it and let's get more schemes through, get more money in the programmes" (Welsh Government)

> "it's their job [the local authority] to go and seek out and have those conversations. We kind of hint and push but it's for the actual lead local flood authority to take forward the scheme […] we'd be quite happy if they said we're not putting in anything, 75% coming from Welsh Government, 25% coming from a consortium of rail, RSPB, National Trust, whatever, that would be fantastic, we'd love to hear that" (Welsh Government)

A key difference between the Welsh and English systems is the absence of a rigid cost-benefit ratio for approving schemes. Welsh Government explained "*we don't have that bar in Wales, we think if there's a high risk of flooding, if there's a need for a scheme, it needs to happen, so, the bar in Wales, we'd like to say it's somewhere around 3 or 4, but we don't have the bar*". A more flexible approach is taken in Wales and all schemes with a cost-benefit ratio over 1 are considered, with points awarded on a sliding scale (Welsh Government, no date). Funding is predominantly prioritised according to the level of risk, as determined through the Communities at Risk Register (CaRR). This ranks all sources of flood risk alongside demographic information and essentially provides a national flood risk index based on modelled data, which ranks the 2208 communities in Wales.

The methodology for **scoring proposed schemes** and prioritising funding from the FCERM capital programme, uses a scoring system and two stage approach, involving a i) Outline Business Case (OBC) / Business Justification Case (BJC), and ii) Full Business Case (FBC) or construction (Welsh Government, no date). The greatest weighting is assigned towards the CaRR, based on the annual maximum rank for fluvial, tidal and/or pluvial flood risk, and points are awarded on a sliding scale to the top 50% of communities. To accompany the CaRR (i.e. modelled risk), points are also awarded for the frequency of actual flood events that have occurred over the last 20 years and impact (in terms of number of homes flooded). The scoring methodology also takes into account the number of homes benefitting from the scheme, as well as the cost per home and cost-benefit ratio (the latter two are only included in the FBC appraisal). Opportunities for partnership funding are encouraged, with points awarded for schemes where additional funding has been agreed, as well as for schemes where there are no realistic or relevant opportunities for partnership funding to minimise the potential disadvantage that this might otherwise cause. In the FBC methodology, opportunities for partnership funding make up 10% of scoring system. While opportunities for wider benefits are included in the approach, this forms the smallest contribution to the final score (5%), based on a binary (yes/no) response and accompanying written description. Welsh Government explicitly state that these "*should not just repeat the Well-Being Goals but provide actual examples of what wider benefits may be achieved*" (Welsh Government, no date). It was also felt that this provides a space for including less tangible, qualitative benefits such as well-being, within the scoring system, although it was clear that efforts to quantify such benefits (i.e. to increase the

cost-benefit ratio) are preferable - "*we're saying please try because the more you can quantify these things, the more chance you have of getting the scheme*" (Welsh Government). Several interviewees reflected on the difficulties of achieving this and trying to quantify wider, often intangible, benefits for society. Moreover, one can be critical of the extent to which the small scoring-proportion attributed to this, actually incentivises consideration of the wider well-being benefits of FCERM schemes. Nonetheless, it is important to acknowledge the positives of the methodology, in terms of its transparency and clarity. Another strength of the current approach, is the presence of accompanying guidance to RMAs which supports the inclusion of climate change allowances (e.g. for river flood flow and extreme rainfall etc.) within the design of FCERM schemes, to inform precautionary and Managed Adaptive approaches (Welsh Government, 2017o).

However, the challenge of **securing additional funding** at the local scale was something that was raised by some interviewees and during the stakeholder workshop. To date, small amounts of funding have been secured through private sector investment, with examples in Conwy, Denbighshire and Gwynedd Councils (Wales Audit Office, 2016). However, mechanisms for incentivising private sector investment are lacking. A key recommendation from the workshop was the need to explore mechanisms for incentivising private sector involvement in FCERM schemes (including utility and infrastructure providers). There was also a consensus amongst the group that '*funding partnerships'* (not Partnership Funding *per se*) are essential for delivering multi-beneficial schemes that cross-government and sectors (Alexander et al., 2019).

Although some interviewees expressed some concerns surrounding the **Partnership funding** model adopted in England, a recent evaluation of the approach has shown considerable potential, with increases in the total investment in FCERM above what Government could fund itself (Clarke et al., 2018). The evaluation revealed mixed views amongst key stakeholders in terms of its success and difficulties with raising contributions, with 82% stating that it could be improved. Numerous strengths of Partnership Funding were identified in terms of diversifying funding pots, enabling delivery of smaller schemes, opportunities to secure local contributions and delivery of community-driven schemes which foster community ownership. However, concerns were also raised with regards to the difficulty of getting schemes through the system, as well as fears that the funding awarded (and scheme designed) are heavily influenced by the interests/contributions of external parties, rather than scheme merit. Improvements were called for, such as the need to refine the funding calculator to i) better reflect the requirements of different types of schemes and better promotion of nature-based approaches, ii) the need to streamline the process surrounding legal agreements, as well as iii) improving knowledge around tools and approaches for calculating wider benefits. A recent publication by the Efra Committee (2019) also highlights the increasing difficulties of attracting private sector

investment, despite the presence of current tax incentives[26], and has called upon UK Government to demonstrate how it intends to incentivise further contributions. Nonetheless, there are considerable opportunities for cross-border learning. Indeed, Welsh Government have expressed their intention to monitor the progress of Partnership Funding and have also tasked the newly-created Flood and Coastal Erosion Committee to explore funding opportunities by the end of 2021 (Welsh Government, 2019a). As discussed during the interview process and stakeholder workshop, further research into future incentive mechanisms for securing private sector contributions will be required if funding contributions are to diversify in Wales.

Other avenues of funding are available to local authorities through the Local Authority Single Revenue Grant, which is funded through Welsh Government's Environment and Sustainable Development Directorate, to support i) better natural resource management, ii) local environment quality, as well as iii) the well-being agenda more widely, and thus, actively promotes the development of multi-beneficial schemes. This funding stream became operational in the 2015/16 financial year and provided £1.576m to local authority revenue activities in the same year (NRW, 2016d). Core funding is also available through the Environment and Sustainable Development Directorate to third sector organisations (such as WLGA, RSPB and Welsh Wildlife Trust).

From 2016, Welsh Government also introduced a **Small Scale Works Grant** which makes up to £100,000 available for maintenance and Natural Flood Management (NFM) projects carried out by LLFAs. This grant has been allocated £1m annually until 2021 (Welsh Government, 2019a). The introduction of this new grant can be praised for providing a simplified approach for LLFAs to access funding for small works to better support incremental improvements and ongoing maintenance of assets at the local scale.

Funding for maintenance works carried out in Internal Drainage Districts (IDD) is raised from i) IDD landowners and occupiers, ii) local authorities and iii) NRW. Recent changes are being made following a funding review in 2017 to provide a consistent formula for calculating precepts paid by local authorities and landowners or occupiers, and to gradually raise precepts to sustain the necessary financing required for maintenance works (NRW, 2017b). This is calculated on an annual basis and supports maintenance and clearance works to manage water levels and land drainage, and in turn flood risk.

[26] Under the *Finance Act 2015* (Schedule 5), companies and unincorporated businesses are able to claim tax relief on funding contributions to FCERM schemes.

Keeping pace with current and future threats

The Auditor General for Wales's inquiry in 2016 concluded that FCERM funding had been broadly stable from 2010-11 to 2016-17. Moreover, Welsh Government invested £116m in FCERM activities between April 2014 and March 2016, across capital and maintenance activities, reducing flood risk to an estimated 5,000 properties (NRW, 2016d). An estimated £350m in capital and revenue funding has further been allocated between 2016 and 2021 (Welsh Government, 2019a), as well as ca. £850,000 from NRW towards property-level measures since 2010/11, benefitting over 600 properties (ASC, 2016).

Medium-term capital commitments have been allocated through the FCERM and CRMP programmes, which were widely regarded as a strength in the current approach. Although criticisms were voiced about the length of CRMP and insufficiency of a three-year programme, most interviewees agreed that this was an important step forward and essential for longer-term planning. For instance, one interviewee remarked: *"[we're] risk averse and if we don't get that commitment, that financial commitment for three or four years then we're not going to be looking at medium or long-term planning*" (WLGA).

In contrast to the capital programme, revenue funding was widely criticised. Although revenue funding supports a wide remit of activities, from defence maintenance, forecasting and mapping, to awareness raising, Welsh Government acknowledged that "*we are capital rich, but revenue poor'*. This was also a prominent theme identified during the stakeholder workshop in July 2019, with the recommendation that a longer-term commitment on revenue and capital funding be made and supported by a longer-term 'wish list' of key needs (Alexander et al., 2019). Keeping pace with current and future projections for sea level rise and climate change are a key concern. Indeed, in 2010 the Environment Agency Wales (predecessor to NRW) explained the need to treble current investment in defences simply to maintain current numbers of properties at flood risk in 2035 (Environment Agency Wales, 2010).

4.2.2. An 'adaptation gap' in funding

Although the CRMP programme is branded as a way of delivering coastal adaptation, several interviewees criticised the programme for its tendency to fund defence-based schemes, such as strengthening defences at East Rhyl and Aberavon. For example, one interviewee commented –"*it started off as a, they were asking for innovative flood defences or adaptations but in my mind it sort of degenerated back into … building new defences*" (Pembrokeshire County Council) – while another commented "*it isn't focused on making our coast more sustainable in the face of climate change for the future*" (NRW). Even the press release from Welsh Government in March 2019 stated that "[*T]he Coastal Risk Management Programme allocates funding for schemes to reduce risk to over 18,000 properties through projects to repair, replace and create new coastal defence systems*" (Welsh Government, 2019d). For this reason, several interviewees described CRMP as a failure:

> "as far as I'm concerned it's a bit of a failure because we shouldn't be building new defences… we need to bite the bullet and turn round and say no we are not going to defend because if we do defend you and those defences fail the consequences will be horrendous… so why spend the money increasing risk?" (Pembrokeshire County Council)

However, in discussions with Welsh Government, it was clear that they did want to see ambitious and innovative schemes emerge from CRMP, but recognised that these expectations differed from those outlined in the 2011 National FCERM strategy to which RMAs must act in consistency with. In the engagement activities surrounding CRMP, Welsh Government felt that they had clearly set out an expectation for imaginative approaches and the use of adaptive and alternative approaches for managing the coastline (Welsh Government FCERM team). To some extent, it is possible that this message may have been lost in translation, or perhaps suffered from a lack of policy coherence given the outdated nature of the 2011 National Strategy. However, our analysis points towards a more fundamental factor at play. As indicated in the quote below, the core eligibility requirement for FCERM and CRMP funding pertains to the protection of people and properties from flood and coastal erosion risks (see quote below).

> "We've expanded the rules a little bit on eligibility … <u>it has to have protection of homes at its core, homes and businesses, that's really important</u> but you should be looking at wider benefits and this is where well-being comes into this … that should be part of the case […] the majority should still be a flood and coastal risk basis but we've not drawn a bar, we've not said oh no more than 20%, no more than 15%, we've just said put the case to us […] I'd have liked to have seen more imagination on that really [CRMP]. I think we're all guilty of just thinking in our boxes and saying okay, it's a flood scheme […] trying to accommodate maybe a more natural way of working with the sea, a better way of working the sea, making space for water … I'm really happy with what we've got but it would have been nice to have a little bit more in terms of how you can adapt that area of coastline" (quote 1, Welsh Government)

Adaptation-based schemes typically diverge from this remit and can include a wide range of options, such relocating people and assets away from risk locations. This can blur the boundaries in funding eligibility. Essentially, when is a flood adaptation scheme no longer a *flood* scheme, but an infrastructure project? From discussions with stakeholders it is clear that certain proposals, such as coastal adaptation in Fairbourne (Box 4.1), have struggled to receive funding for this reason. In Newgale (Box 4.2) for instance, Williams et al. (2019) note the '*lack of housing assets means scheme doesn't qualify for FCERM, nor is the highway in such condition as to warrant a major highway scheme'*. Reflecting on these issues, some interviewees asserted the need to re-frame flooding (and climate change more widely) as more than a technical issue or threat to life and property, but as a wider social problem (see quotes 2 and 3 below). There was widespread agreement amongst interviews that targeted funding is required for adaptation, alongside stronger leadership in terms of '*thinking differently'*. These points are discussed further in the coming section.

> "[Welsh Government see] climate change as a flooding issue in terms of infrastructure management and not in terms of a social and economic issue" (quote 2, Gwynedd Council)

> "…climate change is seen as a flooding issue rather than it being a social and community issue…you can't just talk about flooding, it being the responsibility of NRW and the local authority without them bringing in the issues regarding housing, regarding health and wellbeing, regarding education, you know, the services like water, electricity, gas, roads, railways, everything that encompasses a community needs to be brought into the discussion and NRW and local authorities can't unroll all that ourselves" (quote 3, NRW)

Another challenge discussed by interviewees (including Welsh Government) related to the difficulties of **navigating different funding sources across policy-silos** – "*it's difficult when you have got budgets set in that kind of transport, health, education and that*" (Welsh Government).

> "ultimately we still have very siloed funding…Welsh Government FCERM money is about delivering maximum protection for people and property and all the other stuff is sort of fluffy extras, and so as much as their strategy might say all the right words, actually getting schemes funded, you know plan for adaptations in the future or including elements which are better for biodiversity, are better for landscape, are better for people, or whatever you know, I think that's still going to be incredibly challenging to get funded" (NRW)

There was a strong consensus amongst interviewees that overcoming departmental funding silos is essential moving forwards - "*I think really if Welsh government and ministers want a meaningful and full delivery of the Wellbeing of Future Generations Act they, all their budgets need to be integrated and, you know, talk to each other*" (WCGF). In an effort to address this and identify potential opportunities for cross-department collaboration, Welsh Government explained how the CRMP programme board was comprised of other governmental departments, including regeneration, housing and transport. To some extent, this was regarded by the FCERM team in Welsh Government as useful for stimulating ideas and opportunities for delivering multi-benefits, especially around tourism, regeneration and biodiversity. However, this has been limited in practice – "*it's not really worked, whether that's because people haven't got any money internally or whether we just haven't been as joined up as we need to be. I think perhaps they saw it as this is an opportunity for our pot of money to do things to them…[rather than] let's do this altogether, and also the way that the business case was written in the first place, it was written about protecting homes and businesses*" (Welsh Government). The latter point is particularly interesting and highlights the challenge of working within a restricted remit, where additional benefits of FCERM schemes are seen as an 'add on' to protection, rather than an integrated priority. From speaking with Welsh Government, it also appears that certain sectors were harder to engage in this process, particularly Highways and Network Rail. Engagement with Network Rail is further complicated by the fact that it is not devolved to Wales. To address this, Welsh Government emphasised the need for Network Rail to engage directly

with UK Government on matters of resilience – "…*investment in protecting rail could also be leveraged in such a way that it helps to protect homes and businesses and budgets can be aligned and joined together*".

Key learning points:

Medium-term capital commitments through the FCERM and CRMP programmes have been welcomed, however keeping pace with future climate change and sea level rise is a concern. Diversifying funding sources is seen as essential, but further research is required to better understand how this might be implemented, barriers addressed and action incentivised.

The methodology for prioritising FCERM capital funding continues to favour protective-based approaches and traditional forms of defence. This is contributing to an 'adaptation gap' in funding, which is further exacerbated by budget silos. There is no clear funding stream to support adaptation schemes requiring the managed realignment or decommissioning of assets, or relocation of people or property (discussed further in Section 4.3).

There is a need to reconsider the weighting assigned to multiple benefits to better incentivise delivery of wider well-being goals in FCERM schemes.

Overcoming departmental funding silos is essential for implementing coastal adaptation. Cross-sector representation on boards for programme funding is one way in which this might be mitigated, however, there needs to be clear integration of priorities from the outset, within the original business proposal.

4.3. Coastal adaptation

4.3.1. Overview of Shoreline Management

Coastal adaptation is facilitated through Shoreline Management Plans (SMPs), now in their second iteration (referred to as SMP2). These are non-statutory policy documents that outline the risks and preferred management policies for different units of the coastline; including 4 policy options of No Active Intervention, Managed Realignment, Hold The Line (i.e. of existing defence assets) or Advance The Line. Guidance on SMPs was first introduced in 1995 to provide a strategic vision for shoreline management in England and Wales, with updated guidance provided by Defra in 2001 and in 2006 (Defra, 2006). Different time horizons (or epochs) are considered for short-term (0-20 years), medium term (20-50 years) and long term (50-100 years) to take account of sea level rise, as well as a 'no active intervention' and 'present management' baseline scenarios. Policy scenarios are considered for each Policy Unit and assessed against specified objectives and in accordance with statutory requirements where

relevant, (including a Strategic Environment Assessment (SEA)[27], Habitats Regulation Assessment[28] and Water Framework Directive Assessment[29]) to inform a preferred approach. Crucially, the SMP2s are regarded to be 'live' documents that can be revised on the basis of new scientific evidence[30].

Shoreline management plans are produced by Coastal Groups comprised of Local Authority (LA), Welsh Government and Natural Resources Wales (NRW) representatives, as well as other bodies with coastal responsibilities or a vested interest (e.g. Network Rail and National Trust). While Coastal Groups are responsible for producing, implementing and monitoring, it should be noted that Welsh Government funding enabled SMP2s to be prepared by external consultants (Dodds, 2017a). In Wales, there are four SMPs (South Wales, West of Wales, North West England and North Wales and Severn Estuary); the latter two are cross-border with England[31]:

4.3.2. The role of Coastal Groups

During the interview process, we asked participants to reflect on the role of Coastal Groups and the importance of these for coastal governance. There was a strong consensus that Coastal Groups play a vital role in FCERM, not least in developing and overseeing the implementation of SMP2, which are widely regarded as essential and the "*foundation for a more sustainable and resilient coastline*" (NRW). Coastal Groups themselves, are viewed as a valuable forum for sharing information and bringing otherwise disparate groups together. The Wales Coastal Groups Forum (WCGF) also acts as an important bridge between local and national scales, with members expressing positive views about Welsh Government's involvement in the forum, as well as the membership of key land and asset owners, namely National Trust and Network Rail. The Chair of the WCGF also sits on the newly-created Flood and Coastal Erosion Committee to help ensure the representation of Coastal Groups and coastal matters at a national scale, alongside other types of flood risks.

However, although Coastal Groups are clearly important for coastal governance, there is some concern about sustaining Coastal Groups and maintaining membership and attendance of local authority members in particular, given significant resource constraints. There were also calls to diversify group membership. These issues were similarly highlighted by research into the performance of Coastal Groups (as part of the Wales Coastal Flooding Review), with calls to

[27] The Strategic Environment Directive (SEA) 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment
[28] The Conservation of Habitats and Species Regulations 2010
[29] The Water Framework Directive 2000/60/EC
[30] A high-level review of SMP2 and associated Action Plans is currently being undertaken by Coastal Groups.
[31] SMP2s were formerly approved and signed-off by the Minister for Natural Resources between October and December 2014.

widen the representation of other organisations, particularly landowners (e.g. National Trust, Network Rail and trunk road agencies) and other local authority officers involved with biodiversity and the Wales Coastal Path (NRW, 2016b). This is seen as essential for improving the communication of SMP2s (with several interviewees criticising the technical language and length of the reports), and facilitating their integration into other aspects of coastal decision-making. In additional, some interviewees felt that since the development of SMP2 some Coastal Groups may have lost their identity and sense of direction. As shown in the quote below, this is attributed to a lack of direction from both the WCGF and Welsh Government.

> "…that's continued to be a good forum for sharing information about what's happening on different sections of the coast and … share experience and knowledge... So there are some ongoing benefits to those groups but I would personally say that I think that they have lost their way a little bit since SMP's were produced and that is partly due to a lack of clarity from the Wales Coastal Group Forum but probably ultimately from Welsh Government about what they want the coastal groups to do and deliver and report on and there's a bit of tension there I think between you know the fact that the coastal groups are a voluntary grouping, Welsh Government don't see it as their role to dictate what they should do, it's up to the groups to determine you know what, you know what their purpose is and what they want to work together on which is a nice bit of freedom in some respects but I think without any clarity of purpose and direction from the centre that has left them all to drift" (NRW)

With regards to the WCGF, it should be noted that several interviewees remarked on the considerable improvements within the WCGF in recent years under new leadership, bringing a clearer identity about the role of the Forum and acting as a valuable conduit to Welsh Government. However, despite the view that things have been "*moving in a very positive direction"* (NRW), members of the WCGF have also called for further steering and support from Welsh Government – "*I think there could be a clearer direction from Welsh Government around what they want the WCGF to do, and therefore what they want the coastal groups to do. I think a reluctance to give that steer is strange … I'd like to see Welsh Government really in the driving seat as opposed to coming along with us and doing some stuff on the side which is often how it feels*".

To some extent, the revised National FCERM Strategy sets out a clearer expectation for Coastal Groups to report on the progress of SMP2 action plans on an annual basis (measure 10: Welsh Government, 2019a). This could instil a stronger sense of purpose, while helping to address criticisms regarding the slow implementation of SMP2s (PAC, 2017). This is an important step forward, although it is still not clear how the annual progress reports will be used to ensure action, or how Welsh Government might offer additional resources to support this activity given the considerable constraints already facing Coastal Groups. As highlighted in the quote below, resources, and crucially opportunities for pooling resources, are essential in order to move forwards.

> "[T]here needs to be some really meaningful discussion around pooling resources … it's all very well having the plans, we're struggling to implement things, we're struggling to improve

> our communication, our website could use maps that are a bit more interactive and accessible … so [they public] can sort of understand that bit of their coast a bit better … that all takes time and money but there is the opportunity to pool some of those funds and maybe get some staff in place to help … we've just been a little bit unable to make those decisions because no one is in charge" (NRW)

4.3.3. Coastal monitoring

Coastal monitoring is essential for evidence-based decision-making, yet Wales has lacked a consistent and strategic approach in recent years. In 2010, a Wales Coastal Monitoring Centre (WCMC) was hosted by Gwynedd Council and funded until 2014, but this has remained dormant in the superseding years. The WCMC was recently re-established in 2018 and is situated within the Value of Glamorgan Council under the management of a consortium of coastal local authorities (Vale of Glamorgan Council, Gwynedd Council, Conwy county borough council) and the Welsh Local Government Association.

The goals of the centre are to ensure a national strategic approach to coastal monitoring and the collection of consistent data to monitor long-term trends on behalf of Coastal Groups (including e.g. biannual beach topographic surveys). Whereas in the past, Local Authorities needed to apply for funding on an individual basis, the WCMC provides a coordinated approach, recognising that "*coastal processes don't stop at local authority boundaries*" (WCMC). In turn, this will help to address reported gaps in resources and variations in capacity between local authorities, as some authorities have access to in-house expertise while others do not. This has led to disparities in the data collected and inconsistencies to-date. Addressing this, the WCMC will standardise data collection, while also archiving previous records, and make this accessible through an online web portal.

To ensure an efficient and targeted approach, a risk-based methodology is being developed to prioritise survey activities and allocate the centre's £300k annual funding according to key decision-making needs. The scoring methodology is based on SMP policy units and considers several factors, including the Communities at Risk Register and SMP policy changes in the next epoch – "*so locally they [local authorities] can have more data to inform the decisions that need to be taken at that time*" (WCMC). Stakeholder engagement will be essential to validate this approach and to improve the usability of the survey data for decision-making needs. Overall, the centre was seen by interviewees as a much needed addition to support coastal governance in Wales and adaptation planning. However, there remains concerns over the funding and the long-term future of the WCMC, which is currently funded until 2022, only.

Key learning points:

The re-establishment of the WCMC is essential for delivering a strategic approach to coastal monitoring and providing the necessary evidence required to support decision-making and coastal adaptation planning. Long-term funding for the WCMC should be secured beyond 2022 to ensure this continues.

4.3.4. Challenges implementing Managed Realignment

There are numerous stretches of the Welsh coastline where current policy will need to change from Hold the Line to either Managed Realignment or No Active Intervention. These represent areas where it would be unsustainable (financially, socially and/or environmentally) to maintain or invest in new defence assets in the future. While this is an essential strategy for adapting to future risks and coastal change, our analysis revealed a number of barriers to implementing these policies.

Firstly, it is crucial to stress, that **SMP2s are un-funded proposals**, only. This means that future schemes must secure funding through FCERM-related funding programmes or other means. Furthermore, as discussed in the previous section, there is a reported **'adaptation gap' in funding**, which has been a key barrier to implementing coastal adaptation in prominent cases such as Fairbourne (Box 4.1) and Newgale (Box 4.2). Whilst this is a significant weakness in the current governance arrangement, and these examples remain somewhat in a state of limbo, the fact that adaptative approaches are being conceived and starting to be developed, should be recognised as a strength of the Welsh system. Indeed, one interviewee commented "*the discussions I've heard in Wales are perhaps a little more advanced than I've heard in many parts of England, it feels more real in the sense that these are real problems at the moment whereas sometimes the sea level rise discussions in England are still sort of slightly theoretical"* (national-level interviewee).

Box 4.1: Fairbourne, Gwynedd

Fairbourne occupies a complex flood risk area and is exposed to all sources of flooding, including coastal, estuarine, fluvial, groundwater and surface water. The West Wales Shoreline Management Plan (SMP2) outlines a preferred policy for Managed Realignment from 2050, with No Active Intervention from 2105; thus, requiring the '*relocation of property owners and businesses from Fairbourne*" (Earlie et al., 2011). This decision was based on a critical sea level rise of 0.5m occurring between 2052 - 2062 (uncertainty range of 2042 – 2072). In the meantime, defences are being maintained for the next 40 years and were recently bolstered by the Fairbourne Flood Alleviation scheme – a £6.8m scheme funded by Welsh Government and the European Regional Development Fund via Environment Agency Wales/NRW Flood Risk Management Capital Expenditure Budget.

Key statistics:

- ca. 700 permanent residents and 3,000 during summer periods;
- 62% of residents in the Arthog Community Council area (Fairbourne, Friog and Arthog) are aged 55+;
- 461 properties at risk of flooding (combined across sources);
- Low-lying land, that will be below normal tide levels as sea levels rise;

Image: Fairbourne, Gwynedd. Photo taken by Merryn Thomas, 2018.

To facilitate the transition towards management realignment, *Fairbourne Moving Forward* (FMF) is a multi-agency partnership (established in 2013 and led by Gwynedd Council and the YGC, a consultancy run by Gwynedd Council) and involves Welsh Government; NRW; various departments of Gwynedd Council (including groundwater monitoring and beach surveying; social services; emergency planning; spatial planning) and Gwynedd Council Local Councillor; MEDRA counselling services; JBA ('critical friend' role); community representatives (via Fairbourne Facing Change (disbanded in 2019) and Arthog Council); Royal Haskoning (consultant engineers); Snowdonia National Park; and Network Rail. The project adopts a 40-year planning horizon (2014 – 2054) and aims to maintain a safe, viable community (including infrastructure and business), while working towards a solution for decommissioning the village when required (ca. 2054). The partnership has produced a ***Coastal Adaptation Masterplan*** for identifying and managing the implementation of SMP2 through multi-stakeholder task groups (FMF, 2016; 2018). The Masterplan outlines a preferred way forward, involving medium-term maintenance of defences with enhanced support for social planning and decommissioning longer-term.

A key proposal has been to create a **community interest company** to establish a buy-to-let/equity release scheme (i.e. to purchase at-risk properties and lease them out for the remainder of the property's economic life). The scheme intended to provide local residents with a '*sense of choice'* (Gwynedd Council). A feasibility study was completed and the business case was approved by Gwynedd Council in 2018, but failed to secure an interest-free loan through the *Innovate To Save* funding stream through Welsh Government. Consequently, Gwynedd Council are continuing to the search for other sources of funding. Other activities have included the establishment of a flood warden scheme, a mock evacuation exercise in 2017 and the production of a multi-agency response plan. More recently, the Council launched a 6-week consultation on Thursday 10th October 2019 on the ***Fairbourne Framework for the Future*** (FMF, 2019). Replacing the idea of a Masterplan, this framework organises the high-level tasks that need to be addressed into five complementary **Management Plans** (each led by different multi-agency groups), covering themes for *Flood Risk Management*; *People and the built environment*; *Infrastructure*; *Economy and business*; and *Natural environment*. The consultation asks for feedback and views on both sustaining and retreating from Fairbourne in the future.

Another factor attributed to the slow progress of SMP2s is the continued delays in the production of a **coastal adaptation toolkit**, which was first highlighted in the coastal flood review (NRW, 2015). Expressing their frustration, one interviewee commented "*I think it's really disappointing that there's a concept of having a coastal adaptation toolkit within the recommendations [of] the coastal flooding review in 2014, and we're in 2019 and we don't seem, from the outside looking in, we don't seem to have got anywhere with it*" (NRW). According to the WCGF, the original intention was to circulate an online questionnaire to coastal local authorities but this became too complicated given the breadth of the information required. Instead, local authorities have been consulted through emails and one-on-one discussions focused on coastal areas subject to future policy change in epoch 2 and 3. In particular, the WCGF intends to document current progress, identify what key receptors are at-risk, understand the challenges and where support might be needed in the future. The need to be pragmatic and provide focused, useable guidance was acknowledged both by the WCGF and Welsh Government, but what form this may take remains unclear. In their response to the Auditor General for Wales's inquiry in 2016, Welsh Government commented on the importance of research in Fairbourne (Gwynedd) to inform the coastal adaptation toolkit (Welsh Government, 2016h). This research has since been completed (JBA Consulting and Icarus, 2016), yet Fairbourne remains in a state of limbo. According to the WCGF, examples are likely to be drawn from across the country or further afield but still considerable knowledge gaps remain. This was further reinforced by Welsh Government, who caution about the extent to which the adaptation guidance will satisfy the needs of local authorities and emphasising that it won't provide the '*magic answer'* (see quote below).

> "quite a lot of it would probably be based on issues and examples of what is happening around the country or elsewhere in the world ... I think we are at the stage at the moment where everything is quite subjective in this area and very difficult to put some guidance or ways of working or approaching the issues when we don't have many case studies or concrete examples to base our decision on and I think that's the issue we face" (Wales Coastal Groups Forum)

> "… how do we engage with planning, how do we engage with housing, how do we engage with transport teams, utilities, how do you move all the pipes and stuff from under the ground, all of these things we don't yet have the answers to. So, we're looking to Gwynedd with their master planning work to try and start getting to grips and hopefully answering some of the more difficult questions … there's guidance on the way but it's not going to be this magic answer that I think some local authorities think… It's more going to be directing them on how they should talk to people and all of the kind of players they should talk to and it's, it is that wider, wider than flood issue, it is about you know the social aspects, the environmental aspects and the economic aspects of how to kind of counsel, realistically move people in such a way, even if you've got thirty or forty years to play with, it's, it'll creep up and then it'll be on their doorstep and then so will the sea so it's, you have to start planning ahead" (Welsh Government)

Representatives from local authorities also expressed concerns during the interview process that the coastal adaptation toolkit/guidance might risk being too prescriptive and were keen to stress that prescription is not what is required. One interviewee commented that "*if it really is a*

toolkit that tells you what a hammer can be used for or what a screwdriver can be used for that might be fine… It mustn't be too prescriptive, it's got to get down to the principles of what you're trying to do" (Royal Haskoning). This point is further reinforced by Williams et al. (2019) – "*It would not necessarily be of advantage for Welsh Government to create a handbook for adaptation, given the difference seen in each individual location*". Moving forwards, it is essential that the guidance/toolkit be co-developed across those involved. This has also been recognised within the revised National FCERM Strategy, which specifies that Welsh Government will work with Coastal Groups and NRW to develop coastal adaptation guidance by 2021 (measure 16: Welsh Government, 2019a).

Regardless of the form this guidance takes, it was very apparent from discussions with practitioners working at the local scale, that additional guidance, support and leadership from Welsh Government is required. This highlights a degree of tension between national vs local leadership on adaptation matters. In general, Welsh Government adopt the view that adaptation is best delivered at the local scale and tailored according to individual place-needs – "*it really can't be a top down approach […] every coastal community is different so there can't be a one rule*" (Welsh Government). Whilst this is accepted in principle at the local scale and the importance of locally-driven adaptation is recognised, this requires **governance mechanisms and policy instruments for enabling adaptation that are currently absent**. In this regard, practitioners are not calling for a prescriptive approach for *how* to implement adaptation, but rather for a strategic framework *through* which to deliver adaptation on the ground.

> "[T]here are local decisions to be made but those local decisions at Fairbourne will affect national, you know set a national precedent … there needs to be some kind of governance around it to say well this is how you should do it and this is the governance process to follow and the decision making process to follow. But we haven't got a process, we're doing the best we can" (NRW)

> "The [coastal adaptation] guidance needs to recognise 'you're in this situation' and therefore this is what *government* can provide in terms of *integrated* support. Not this this a flood and coastal erosion and therefore goes to them, or a social housing issue and therefore goes to them. The guidance has to be a bit introspective on what support government can give" (Royal Haskoning)

At the local scale, adaptation plans such as the *Fairbourne Framework for the Future* (FMF, 2019) and the *Newgale Adaptation Strategy* (PCC, 2017) provide the necessary frameworks for navigating the adaptation *process* over a long-term planning horizon. The emphasis on ***process*** is crucial and stakeholders involved in this, were keen to stress the wider challenges involved – "*it requires a complex coastal change management process*" (JBA). This stands in stark contrast with traditional ways of working and '*predict and provide'* approaches, which can be neatly packaged into a project with a clear end point (see quote below). FCERM governance has evolved around this mode of thinking and delivery that is ill-suited to the process of adaptation – characterised by future uncertainty and conflicts in values and priorities that

inevitably arise when changes to the *status quo* are proposed. Current funding structures in particular, have been highlighted as being at odds with the remit of adaptation (see Section 4.2.2) and even serve to discourage adaptation (Williams et al., 2019). In Wales, and the UK more widely, there are currently **no clear governance mechanisms for funding or implementing adaptive strategies** to roll-back[32] or relocate people, businesses and assets. Certain techniques were piloted in England through the Defra "Coastal Pathfinder" projects, but to limited success (Defra et al., 2012; 2015). The topography of Wales further restricts the viability of roll-back options.

> "Where there are areas that are going to be affected by coastal change, we need to have some policy, or some recognition, that we are then moving into a coastal community adaptation project. In doing that we also need to start thinking *beyond projects*…typically in FCERM, you identify a problem, you then come up with a solution, you consult on the solution… if that's defences, the defences then get built and then everyone walks away. And there is no longer any thought for the future. … the situation we are moving into is that you have communities that will be continually changing into the future and therefore it is starting to think how do we want this community to function or can we no longer have a functioning village, and therefore you need to broaden that our in terms of what is being looked at" (Royal Haskoning)

Moving forwards, there is a need for FCERM governance to adapt and evolve. This will require further research into innovative governance mechanisms, that takes a holistic perspective across FCERM, spatial planning, building regulations and insurance sectors for example, to diversify options for delivering adaptation on the ground. This also raises additional questions about who is responsible for coastal adaptation and who should pay for adaptation. The current gap in responsibility was discussed by several interviewees, as outlined in the quotes below. At this point in time, **coastal adaptation appears to be slipping through the gaps created by siloed governance** when, instead, an integrated approach is required. Clarity of responsibilities (across RMAs, government and citizens themselves) is essential for navigating complex change management processes and defining clear boundaries of accountability – "*residents want to know who is accountable for what*" (JBA).

> "No one is actually taking that broader responsibility … you follow the FCERM process and conclude that we cannot fund defence and therefore from a FCERM perspective that's it done. …But then you try to find who takes responsibility for the broader social issues and FCERM go oh well our funding is for defence and risk management, it isn't for social change. And you look around for other people, you go to a department in terms of housing and they say the problem is for FCERM and therefore it doesn't fall in our remit" (Royal Haskoning)

> "[I]mplementation of shoreline management plans isn't just for FCERM […] all of the different levels of governance, from UK level to National level, regional and local, I just think

[32] Rollback is defined as the relocation or replacement of at risk property and infrastructure to areas inland away from the eroding coastline.

> everything is still very much seems to be in its silos […] I really do think that this collaborative approach to delivery of shoreline management plans is an absolute priority… trying to develop multiple funding streams to facilitate better solutions for the coast, but across a range of agendas… we need to work more collaboratively to deliver coastal adaptation … with a wide range of government departments and stakeholders and businesses and things in order for it to be successful" (NRW)

There are recurring calls for stronger **support and leadership** from Welsh Government in terms of driving this forward and establishing a national framework for adaptive governance. As discussed in Section 4.1, there is a need for Welsh Government to strengthen its position around coastal adaptation and fundamentally reconsider how the funding formula within the FCERM/CRMP programmes are adjusted to accommodate adaptative schemes. The coastal adaptation toolkit/guidance may also be a key supportive mechanism, providing it is co-produced between Coastal Groups, WCGF and Welsh Government to ensure its utility. Whilst we agree that there is no 'one size fits all' and prescribed top-down approaches are not required, Welsh Government needs to become more hands-on when it comes to proactively supporting coastal local authorities. Moreover, there was a consensus amongst interviewees that adaptation (including planning and resourcing for adaptation), needs to be approached with more **urgency and assertiveness** than is currently being displayed.

> "[P]eople haven't yet taken a long enough view… but how long is it going to take to get a village decommissioned? […] they still will not bite the bullet and say no we cannot afford to do defence for everybody. We do have to do adaptation and we do have to fund that adaptation and it does mean that people will lose their houses and they will have to move and it's how we facilitate that and until Welsh Government take that fundamental shift in mental attitude life is going to be difficult" (Pembrokeshire County Council)

> "There are still some very tricky questions that need answering looking ahead and you can't start planning for that soon enough […] we need to move from talking about it, to how do we resource effective coastal change now" (JBA)

Box 4.2: Coastal adaptation in Newgale, Pembrokeshire

With future coastal change, the shingle bank protecting the A487 in Newgale is expected to become increasingly vulnerable to failure within the next 10 to 20 years. This has significant implications for the current route of the A487, which plays a crucial role in the regional economy; with an estimated net economic value of £3m to £8m per year attributed to visitors using this stretch of the A487 (Pembrokeshire County Council, 2018). It also has significant implications for the preservation of well-being, particularly in terms of maintaining a well-connected community and opportunities for prosperity. To determine the optimal solution, a range of options were examined through the strategic business case, whereby it was determined that the preferred option would be to provide an additional highway link to the A487, while retaining the existing highway and maintaining it for a maximum of 20 years.

© Copyright Andy F, clifftop view showing the single bank and A487 road.

The *Newgale Coastal Adaptation Strategy Plan* intends to provide a framework for navigating the adaptation process to unlock opportunities; therefore, '*using the need to reposition the road as a catalyst for positive planning constructive change*' (Pembrokeshire County Council, 2017). The plan adopts an adaptation pathways approach and outlines key triggers for future decision-making – this includes the opening of the new road, upon which the maintenance of the current road will be withdrawn and the decisions will need to be made about its clearance. At this point in time, there is no clear funding mechanism available for decommissioning this stretch of highway.

The implementation of SMP2s is further challenged by their **non-statutory** nature. As such, there is no legal imperative to formally include SMP2 policy within coastal decision-making across terrestrial or marine planning policy or decisions, despite stipulations that decisions *consider* or have *regard to* SMP2. Indeed, interviewees within the WCGF commented on the **lack of awareness** of SMP2s amongst relevant practitioners and highlighted the need to '*raise the profile of coastal risks in Wales*' (WCGF representative). There was a consensus amongst interviewees that this needs to happen at multiple scales (national to local), across sectors and '*silos*', and tailored accordingly to suit different audiences. One such mechanism, is the newly-launched Wales National Coastal Risk and Climate Change seminar, which will be an annual meeting between key actors in FCERM (e.g. Welsh Government, the WCGF, WCMC, NRW) and elected council members invited across Coastal Groups. Such efforts are essential for raising awareness of coastal change processes and the implications of SMP2. However, this research suggests that further engagement is still required in order to help embed shoreline management in strategic planning at the land-sea interface.

Recent efforts have also been made by Network Rail Wales to consider the long-term implications of SMP2 for the Wales Route, focusing on Gwynedd county in the first instance. With the support of NRW and Gwynedd Council, the project will outline where Network Rail assets intersect with SMP2 policy change units to improve understanding of the choices that

will need to be made in the future (rather than informing decision-making at this stage). This is the first time that such a strategic assessment has taken place and Network Rail were keen to stress that this is very much a "*learning process*", supported by Gwynedd Council – "*they're basically translating it [SMP2]…what does this mean to the railways, what does this mean to Network Rail assets in this area*". This point highlights how the language and format of SMP2s can be difficult to understand amongst non-technical audiences and valuable role that **mediating organisations** can play in translating the implications of SMP2 policy.

When asked whether the **status of SMP2** should be raised (i.e. to become statutory), interviewees were divided in their opinions. While some felt that the duties to consider SMP2 were sufficient, others highlighted the challenges of working within a non-statutory remit (see quotes below). Nonetheless, there was a shared view that the profile of SMP2 should be raised and awareness increased, particularly amongst other local authority departments.

> "I think the fact of them being non-statutory is the biggest problem, with that you probably won't get so much investment or funding being passed on in this area to ensure that the action plans are taken forward or to ensure that they can be built into work programme […] we would like to see the documents to be statutory document so they are embedded in local original policies and strategies development planning" (WCGF

> "As soon as you put non-statutory in front of it, it kind of loses a lot of it's you know, impetus, loses a lot of it's you know strength" (SEP)

> "I'm a bit on the fence with this because I think that it would be incredibly difficult to produce something that is a 100-year plan and make it statutory … and I suspect that it would be incredibly watered down… So, in some respects I would be concerned that they wouldn't achieve what they have achieved. [SMPs] should be being used as reference in Local Development Plans and the Wales National Marine Plan, and in making marine licensing decisions... trying to propose something that's not in line with that SMP policy is more difficult to get through a licensing procedure … As much as it would be nice to have them as statutory documents, I'm just, I'm not sure how achievable that is" (NRW)

> "[T]he main controls are in the planning system so as long as the planning system takes the SMP as the policy to be applied to the coastline then there's no real need to have them as a statutory document because the planning process will do it" (PCC)

Where the non-statutory status of SMPs becomes problematic is instances where shoreline policies intersect with existing **Public Rights of Way (PRoW) and associated legislation** (namely the *Highways Act 1980* and *Countryside and Rights of Way Act 2000*). Indeed, many flood defences serve as PRoW, moreover the Wales Coast Path hugs the coastline; yet formal guidance for local authorities on PRoW makes no mention of shoreline management (Welsh Government, 2016g). In the legislation, PRoW are defined as highways and therefore subject to the protection afforded to this status - "*Once a highway has come into being, by whatever means and whether it is recorded or not, it continues indefinitely no matter whether it is used, unless there has been a legal Order closing or diverting the way*" (Welsh Government, 2016g: 38). A legal record of PRoW is maintained by the local authority (as the surveying authority) within the Definitive Map and Statement (DM&S). The legal imperative to maintain and protect

PRoW supersedes SMP2 policy. A recent summary of this issue was provided by NRW to the WCGF, which similarly highlights the incompatibility between current PRoW legislation and the dynamic nature of the coastline (NRW, 2019b). While the legislation makes provisions for diverting or extinguishing a PRoW through public order processes, this can be exceptionally lengthy and does not allow for PRoW '*to degrade on grounds of costs or reasons of sustainability'* (NRW, 2019b). Furthermore, the public can exercise their legal rights to enforce local authorities to maintain PRoW (under the *Highways Act 1980*, S56), such has been the case in the Cwm Ivy habitat creation project (Box 4.4). The legislative restrictions also create challenges for realigning the A487 in Newgale (Box 4.2). Correspondingly, numerous interviewees emphasised the need to the address the inflexibility of current Highways legislation.

> "[T]here is no mechanism seemingly for declaring a road if you like surplus to requirements and getting rid of it. Once you've actually created a highway, that's it, nobody, when the highways legislation was thought, nobody ever thought about abandoning a road and doing away with it so it's going to be a problem in Newgale … technically it still remains a highway and somebody can petition to have it opened again." (PCC)
>
> "There's a lot of old bits of legislation that were created before the era of climate change awareness that are really prohibitive to the delivery of coastal adaptation" (NRW)
>
> "I think there's a need for a softening of highways legislation in terms of allowing diversion orders or modification orders when it comes to habitat creation or climate change issues. I think at the moment we're very kind of stuck in the 1980's" (National Trust)

To address this, the WCGF have asserted the importance of establishing an SMNR approach towards public access in coastal areas. This comes at a time where Welsh Government are responding to the recent consultation '*Taking Forward Wales' Sustainable Management of Natural Resources'* (Welsh Government, 2017j), which includes access reforms (Welsh Government, 2019h). As part of the access reform programme, Welsh Government have proposed to establish an independent Access Reform Group to develop practical solutions to the more significant changes required within access rights. Several of these proposals may have implications for coastal access, especially proposal 13 '*extending access land to the coast and cliffs*' and proposal 20 '*amend technical provisions around creating, diverting and extinguishing rights of way*'. We understand that the WCGF are currently discussing how best to address these issues moving forwards. Suggestions have included collecting evidence around current coastal assets that act as PRoW where future policy change has been identified, or directly engaging with the National Access Forum to examine opportunities for collective action (NRW, 2019b). This research has similarly highlighted the pressing concerns facing the PRoW issue; therefore, we fully support these suggestions and recommend early engagement between the WCGF and the National Access Forum, as well as the proposed independent Access Reform Group, to discuss how access reforms may better support coastal adaptation.

4.3.5. The 'difficult conversation'

Numerous interviewees discussed the need for more direct, honest communication about future SMP2 policies for Managed Realignment or No Active Intervention and the implications of these for local communities, particularly where the community may no longer be viable for the future. This issue was raised by the Wales Audit Office in 2016, who observed a lack of options for community engagement to help councils to prepare communities for managed realignment (Auditor General for Wales, 2016). Similarly, interviewees emphasised the need for having 'the difficult conversation' - "*we need to be engaging with them [local communities] now on a long-term basis, on a twenty/thirty-year basis*" (NFF), and "*move towards a kind of acceptance that change needs to happen in certain locations and then the conversations can move onto what will that change look like and how can we manage*" (NRW).

There are few examples where this appears to be happening, In the case of Fairbourne for instance, Gwynedd Council have been incredibly active at initiating and sustaining dialogue with the local community, with another public consultation, the "*Fairbourne Framework for the Future*", launched in October 2019. Moreover, Gwynedd Council explain this as a moral responsibility; "*We cannot – as a responsible public sector body – refuse to plan for what we know will eventually happen. It would be irresponsible and immoral*" (FMF, 2016: 38).

Considerable lessons have come from the *Fairbourne Learning Project*, which was commissioned by Welsh Government to investigate the SMP2 consultation process. The first learning bulletin (JBA and Icarus, 2016) identified significant weaknesses in the planning and implementation of stakeholder engagement, particularly in the scoping, assessments and policy development stages. In turn it was argued that this not only led to the delays in the approval and delivery of the SMP, but also negatively impacted upon the relationships between the public and responsible authorities, and undermined trust. Indeed, when the SMP was formally adopted it attracted considerable media attention, with the BBC's *Week in Week Out* broadcast on 11th February 2014 mis-reporting that the village would be abandoned within 10 years. In response, the local community tried to launch a Judicial Review against the local council and SMP process, but were unable to raise the necessary funds in time. The Fairbourne Learning project has since emphasised the need for a whole system *commitment to the value and principles of engagement*, alongside accompanying resources, capacity building and training to ensure the effective design, management and delivery of public engagement. The report discusses the need for an overall **engagement route map** and value of targeting resources towards key hot spot areas subject to future policy change, as well as asserting the importance of 'relationship building'. Addressing these concerns, Gwynedd Council have worked hard to develop its relationship with the community, employing a dedicated project officer who has drop-in sessions on a bi-weekly basis. A formal engagement plan is seen as essential – "*there's a risk that a Fairbourne conversation will go on and on and on, without actually reconciling or resolving some pretty thorny issues, so, it really needs an engagement plan*" (JBA).

The case of Fairbourne highlights another important matter surrounding the **language** employed by RMAs and consultancies to describe the implications of SMP2 policy. The expression '*decommissioning*' in particular, has been widely debated and criticised by some for using a term typically associated with physical assets to refer to a community of people. More widely, there have been calls for sensitive communication and language that embodies attributes of sympathy, empathy, care for well-being and sense of moral duty in implementing socially just and 'compassionate transitions' for the future (O'Riordan et al., 2019). Defending the use of 'decommissioning', others have argued that the term at least provides a direct and unambiguous message about the future, and gives a clear understanding of what needs to happen and what collectively needs to be worked towards (see quote below). Moving forwards, there is an apparent need to balance the sensitivity with clarity.

> "Do we keep it vague? Do we say in the future we need to 'adapt'? Because equally on other occasions people have said to me what do you mean by adapt, that means people lose their properties, they're made homeless, they have to relocate. Any word that you use, you've got to have the urgency that this is something that is real [..] [decommissioning] comes from [the fact] that we want to be in a situation at some point in time by the end of the planning horizon where effectively Fairbourne has as a village been decommissioned. So that we are no longer in a position where we need to defend [..] If someone can come up with a better term great […] It's quite a harsh word, but it's a harsh reality this" (Royal Haskoning)

Another important point from discussions about Fairbourne concerned the **relationship with the media**. This was often discussed by interviewees in two capacities – either as a 'friend' or 'foe'. From the latter perspective, interviewees discussed the strain and even damage that the media can cause to the relationship between local communities and the authorities. This was especially true with the mis-reporting of the SMP2 policy for Fairbourne in the BBC's *Week in Week Out* in 2014. Despite this however, the media was also seen as a crucial channel for communication, to help raise awareness of coastal challenges and establish a national conversation of the issues at hand.

> "[F]ortunate on one hand but unfortunate on the other hand…people know about climate change and flood risk because of Fairbourne but most other people along that stretch of coast are just going ah poor things at Fairbourne, not thinking that it could apply to them as well and as time goes on we need to be having these conversations in a lot of other places along our coast and you know making that part of the day to day conversation about how do we shape our communities in the future … there's definitely scope to use the media in a sensitive way to just, just to start getting it into day to day conversation" (NRW).

In moving forwards and initiating these so-called difficult conversations, interviewees described the necessity for stronger **guidance and adequate resources and training** to support this type of public engagement in the future. While local authorities and NRW engagement officers may take the lead on this, it will be important for all RMAs and Coastal Erosion Risk

Management Authorities to actively engage local communities in a consistent, honest and transparent way, and moving away from traditional forms of consultation. For example, one interviewee remark – "*It's about coming up with ideas collaboratively with that community and really listening to what their concerns are and trying to address those and undertake an approach to delivery and I'm not too sure the traditional method of consultation really is*" (NRW).

Effective community engagement (as opposed to consultation) should be used to explore future adaptive options with communities directly, particularly contentious options such as buy-to-let and roll-back (Defra et al., 2015). A useful engagement technique may be to visualise and explore *adaptation pathways*; a technique which explores different levels of risk, and key thresholds and 'triggers' for decision-making (such as the occurrence of storm events or gradual changes to sea level rise). For example, a recent study in England examined opportunities for using adaptation pathways and adaptation pathway diagrams in selected case studies to visualise different scenarios and communicate the dynamic drivers influencing future management (Jacobs, 2018). The research highlighted the added value of the approach compared to the seemingly rigid and static SMP policy epoch tables. However, simultaneously, it is important to establish realistic boundaries to these discussions; indeed, as one interviewee remarked "*it has to be really well-informed about the practicalities of it. Not a wish list. It can be aspirational but it shouldn't be an unrealistic wish list*" (Royal Haskoning).

Other techniques have also been examined in a recent evidence review into community engagement on climate adaptation (Kelly and Kelly, 2019). Based on analysis of 300 reports and publications, the review emphasises the importance of not assuming a shared understanding of key terms (e.g. climate change, adaptation etc.) and framing flood and coastal erosion risks around locally relevant issues. In particular, the report stresses the need for appropriate and sensitive language that acknowledges peoples' emotional connections to places ('place attachment') and the potential mental health impacts that may arise from such discussions. Calling for a co-productive, collaborative approach, the report specifies the inclusion of engagement practitioners, local communities, technical specialists and artists to support **participatory and creative methods** - such as simulations, visualisations, role-play, storytelling and creative forms of communicating flood narratives such as community opera. This research is still ongoing and will be piloting community engagement methods in selected locations in England to help inform good practice guidance. This has the potential to provide a useful stepping stone for developing creative approaches to meaningful public engagement in the future. However, a critical observation of the report is that many authorities/agencies and communities themselves, are ill prepared to engage in the complex planning processes for FCERM and lack 'readiness' – defined as the knowledge, skills and capacities needed to enable collaborative decision-making (Kelly and Kelly, 2019). Building readiness requires efforts to forge a shared understanding of local risks and adaptation needs, giving voice to communities at-risk and enabling different options for the future to be collectively discussed and agreed upon.

There is widespread agreement that **communities should be placed at the heart of discussions** of coastal change. This is more than simply about securing community 'buy-in' and acceptance of pre-determined approaches, but about fostering a sense of ownership, collective responsibility, empowerment and capacity for communities to act and play a key role in determining their future (e.g. Williams et al., 2019). This is a recurring theme in current adaptation strategies in Wales, as illustrated in the extract below from the Newgale Adaptation Strategy Plan. Rather than focusing solely on the negative impacts of coastal change, the Newgale strategy in particular, pays considerable attention to the opportunities that coastal change may unlock for the community and area more widely. This ties back to the earlier argument around language and the terminology used to described adaptation, and demonstrates how positive storylines can be incorporated into the discourse of coastal change. Early engagement is also seen as fundamental (see quote 2, below).

> "[A]daptation needs to be driven by ideas emerging at a local level. The [Newgale] Plan aims to encourage and empower individuals and groups to lead the adaptation process and take decisions on what should be done and when, providing a structure and framework. Central to this approach is the principle that adaptation cannot be solved through a single action, but is rather a process to be managed over time by the community, for the community" (Pembrokeshire County Council, 2017: 4)

> "It needs to start early, you need to be building trust, making connections as to what delivery of that policy might look like to get that level of understanding […] It's a learning process first of all, then it's a dialogue" (quote 2, JBA)

A final theme that emerged from discussions about coastal adaptation related to the **political dimension** of coastal adaptation. There was a unanimous view that Managed Realignment and No Active Intervention policies are not political palatable and are typically incompatible with election cycles which tend to promote shorter-term concerns; "*a lot of the people who are involved in these discussions are elected representatives … they don't want to be the one that says this is no longer viable. It's not exactly going to be a vote winner for them*". Addressing this, many interviewees emphasised the need for political bravery and commitment to acting now to ensure the well-being of future generations to come. In fact, one interviewee felt that the *Well-being of Future Generations (Wales) Act 2015* could provide a '*mechanism to latch on to unpleasant decisions, or politically unacceptable decisions that nevertheless you've got to make*" (PCC).

However, this is often challenged when significant flood events occur and the typical 'political knee-jerk reaction' is to promise future defence. This is often fuelled by public pressure; "*when the crunch comes and people are affected, they want to see the money having been spent most effectively on protecting people and property*" (NRW). However, it is these points in time where direct and honest conversations are essential to avoid setting potentially dangerous and unsustainable precedents for the future, while maintaining nationally consistent and fair FCERM. In this vein, interviewees were keen to assert the importance of maintaining a '**united**

front' when it comes to addressing coastal adaptation. It was further felt that the 'climate emergency' declaration could (and should) be used to gather political momentum and societal acceptance of the urgency for coastal adaptation.

Key learning points:

Coastal Groups play an essential role in coastal governance but additional resources, and opportunities for pooling resources, are required to increase the capacity and effectiveness of Coastal Groups and their ability to implement SMP2 action plans.

There is a need to raise the profile of SMP2s amongst a broader remit of stakeholders operating at national to local scales, in order to better embed shoreline management in strategic planning at the land-sea interface.

Coastal adaptation is seriously constrained by the absence of governance mechanisms/policy instruments, the 'adaptation funding gap', the lack of clear responsibilities for adaptation, and lack of strategic leadership and guidance from Welsh Government. Further research is required into innovative governance mechanisms for enabling adaptation (e.g. looking across FCERM, spatial planning, building regulations and insurance sectors).

A strategic framework through which to *deliver* adaptation on the ground is essential. Clarity of responsibilities (across RMAs, government and citizens themselves) is essential for navigating complex change management processes and clearly defining the boundaries of accountability.

Legislative rigidity in the form of Public Rights of Way is one of the key barriers to implementing coastal adaptation. Therefore, there is a need for engagement between the WCGF and the National Access Forum / proposed independent Access Reform Group to discuss how access reforms may better support coastal adaptation.

'Difficult conversations' require *sustained* dialogue (rather than one-off events) with local communities and stakeholders, alongside sufficient resources and training for staff on the ground. Consistency, honesty and transparency are essential, while recognising the need for sensitive and compassionate language. Further research is required to understand and develop alternative approaches to community engagement to expand the 'engagement toolkit'. A formal engagement plan (or 'route map') is essential.

Communities should be placed at the heart of discussions of coastal change and play a key role in determining their future.

In the context of a declared climate emergency, there is a need for a greater sense of urgency towards coastal adaptation. Early planning is crucial.

4.4. Ecosystem resilience

4.4.1. The Environment (Wales) Act 2016 - Overview

The resilience of ecosystems is seen as the foundation for well-being and prosperity in Wales. This is recognised in the national Natural Resources Policy – "*Wales' natural resources underpin our well-being including our prosperity, health, culture and identity*" (Welsh Government, 2017g). Therefore, as part of this research we examined the extent to which FCERM (and its interaction with other policy domains) supports ecosystem resilience in Wales. We adopt the formal policy definition of ecosystem resilience, whereby *ecosystems are considered to be resilient if they are able to cope with disturbance or change so that they maintain their functioning and ability to deliver benefits* (NRW, 2016a: 15).

The Environment (Wales) Act 2016 mandates for the Sustainable Management of Natural Resources (SMNR), defined as using natural resources in a way, and at a rate, that maintains and enhances the resilience of ecosystems and the benefits they provide (also see summary in National Assembly for Wales, 2019). Natural resources include, but are not limited to, animals, plants and other organisms, air, water and soil, minerals, geological features and processes, physiographical features, and climatic features and processes. The Act outlines the principles of SMNR (see Box 4.3), and further places 'a biodiversity and resilience of ecosystems duty' (referred to as the Section 6 duty) on public authorities to maintain and enhance biodiversity in exercising their functions, and in so doing, promote the resilience of ecosystems (in terms of diversity, connectivity, scale, condition and adaptability; see Box 4.3). Fulfilling this duty, public authorities[33] are required to prepare a plan[34] and publish a progress report before the end of 2019 (and every third year thereafter).

[33] This applies to public authorities other than a Minister of the Crown or government department.
[34] Section 6 Plans are available from https://www.biodiversitywales.org.uk/Section-6. Not all plans have been published at this stage.

Box 4.3: The Principles of Sustainable Management of Natural Resources (SMNR)
(Part 1(S4), *Environment (Wales) Act 2016*)

a. Manage adaptively, by planning, monitoring, reviewing and, where appropriate, changing action;
b. Consider the appropriate spatial scale for action;
c. Promote and engage in collaboration and co-operation;
d. Make appropriate arrangements for public participation in decision-making;
e. Take account of all relevant evidence and gather evidence in respect of uncertainties;
f. Take account of the benefits and intrinsic value of natural resources and ecosystems;
g. Take account of the short, medium- and long-term consequences of actions;
h. Take action to prevent significant damage to ecosystems;
i. Take account of the resilience of ecosystems, in particular the following aspects—
    i. Diversity between and within ecosystems;
    ii. The connections between and within ecosystems;
    iii. The scale of ecosystems;
    iv. The condition of ecosystems (including their structure and functioning);
    v. The adaptability of ecosystems.

The *Environment (Wales) Act 2016* also mandates that Welsh Ministers establish a national Natural Resources Policy (NRP) [35] for contributing to SMNR and outlining the key priorities, risks and opportunities. This was published in 2017 (Welsh Government, 2017g). The NRP advocates a holistic, joined-up approach to SMNR and cross-sectoral working to support 'win wins' and multi-beneficial schemes. Key opportunities are identified in terms of i) supporting successful, sustainable communities, ii) promoting green growth, iii) supporting a more resource efficient economy and iv) maintaining healthy, active and connected communities. Conversely, key challenges are identified in relation to i) improving ecosystem resilience, ii) addressing climate change and the decline in biological diversity, and iii) the UK's Withdrawal from the EU. In particular, healthy and resilient ecosystems are regarded as vital for tackling climate risks and building resilience to the impacts of climate change, such as flooding (Welsh Government, 2017g: 11). The NRP further outlines national priorities for delivering nature-based solutions, increasing renewable energy and resource efficiency, and taking a place-based approach.

Natural Resources Policy and SMNR are underscored by the State of Natural Resources Report[36] (SoNaRR; NRW, 2016a), which provides a national baseline for SMNR, alongside an

[35] The national Natural Resources Policy must be reviewed after each general election, although can be revised at any time by Welsh Ministers.
[36] NRW are required to produce the State of Natural Resources Report under section 8 of the *Environment (Wales) Act 2016*.

assessment of biodiversity, trends and factors affecting the state of natural resources and current knowledge gaps[37]. The report reveals an overall decline in biodiversity and that all ecosystems have problems related to one, or more, of the attributes of resilience (diversity, connectivity, scale, condition and adaptability).

4.4.2. Policy coherence with FCERM

There is a strong policy coherence and alignment between FCERM and natural resource management in Wales. The concept of Ecosystem Services[38] is embedded in Natural Resources Policy (NRP), of which flood risk management is recognised as a key regulating service; moreover, reducing the risk of flooding is cited as a key challenge for SMNR (Welsh Government, 2017g). Nature-based approaches are emphasised in both agendas, with nature-based climate solutions identified as a top priority within NRP. This provides a strong strategic steer towards the enhancement of ecological resilience in Wales, and clear line of sight between national to local scales. In turn, this contributes positively to the Resilience well-being goal outlined in the *Well-being of Future Generations (Wales) Act 2015* (and discussed further in Section 5.2.2). The ethos in FCERM towards nature-based solutions is further compatible with the Nature Recovery Action Plan and wider efforts to address declining biodiversity in Wales (Welsh Government, 2015c). Moreover, FCERM Business Case Guidance requires Natural Flood Management options to be short-listed in the options assessment (Welsh Government, 2019c) – "*they need to give a good reason why that wasn't part of fully taken forward into the third option… it is changing their mindsets and starting to think about other things*" (Welsh Government).

The alignment between FCERM, Natural Resources Policy (NRP) and environmental management more widely, means that schemes with flood-related benefits could be delivered through additional sources of funding, external to the FCERM programme. For instance, the *Enabling Natural Resources in Wales* grant (available through the Rural Communities Rural Development Programme, 2014-2020 in Welsh Government), directly supports demonstration projects promoting cross-sectoral collaboration for green infrastructure, environmental quality and ecosystem resilience. Similarly, the *Enabling Natural Resources and Well-Being in Wales* grant (2019-2023) focuses on improvements in urban areas, while the *Sustainable Management Scheme* intends to support the climate resilience of rural business and communities through collaborative landscape-scale projects. In this regard, the momentum

[37] Under the *Environment (Wales) Act 2016* NRW must update and publish the SoNaRR every 5 years before the general election is due to be held.

[38] Ecosystem services are defined in the Millennium Ecosystem Assessment as the benefits people obtain from ecosystems. These include *provisioning services* such as food and water; *regulating services* such as regulation of floods, drought, land degradation, and disease; *supporting services* such as soil formation and nutrient cycling; and *cultural services* such as recreational, spiritual, religious and other non-material benefits (MEA, 2005: 27).

towards SMNR and newly established Natural Resources Policy provides the potential to unlock grant-in-aid and deliver schemes with flood-related benefits outside the traditional FCERM programme. Within the FCERM programme itself, other benefits such as ecosystem resilience may be delivered through NFM and hybrid projects, which are eligible for grant funding, providing that the primary objective of the scheme is to reduce flood risks to people and properties.

4.4.3. Implementing area-based approaches

Another key priority in NRP is the need for place-based approaches. To deliver this, the *Environment (Wales) Act 2016* (section 11) requires NRW to prepare and publish Area Statements, with reference to the natural resources in the area, the benefits provided, and priorities, risks and opportunities for SMNR, including how NRW proposes to address these priorities as well as identifying the public bodies with the potential to assist. There are 6 land-based areas[39] (coinciding with NRW's existing operational areas) and a seventh area for the marine area statement. The final publication of the first Area Statements is anticipated by March 2020 (National Assembly for Wales, 2019).

The wording of the legislation is relatively weak when it comes to the implementation of Area Statements. NRW are required to *encourage* others to take steps to implement Area Statements, while Welsh Ministers *may* direct a public body to take such steps (within the remit of exercising its functions); although, if such a direction is given, the public body has a statutory duty to comply. Furthermore, public bodies must have *regard to* the Area Statement and any guidance provided by Welsh Ministers. It is too early to speculate how the legislation will be enacted in practice at this stage; nonetheless, there is a clear expectation that Area Statements will provide a valuable local evidence-base as well as a key governance mechanism to facilitate SMNR and identification of opportunities for collaborative working through which multi-beneficial schemes and catchment-based management can be delivered. While the Area Statements are primarily geared towards public authorities, NRW has expressed a hope that these will also inform decisions outside the public sector (National Assembly for Wales, 2019). It will be important to monitor and evaluate the extent to which Area Statements perform as intended once adopted.

Internally, NRW has undergone an organisational restructuring to better deliver the area-based approach. The new organisation structure means that teams now cut-across job functions to make it easier to identify multiple-benefits and '*win win opportunities'*, "*to deliver place-based*

[39] Area Statement Areas include Mid-Wales, North East Wales, North West Wales, South East Wales, South West Wales and South Wales Central, and Marine. A boundary map is available from https://naturalresources.wales/about-us/area-statements/area-statements-overview/?lang=en

working more efficiently than it was previously" (NRW). However, there were also some concerns amongst some NRW interviewees that there '*isn't necessarily enough people to go around to have one of everything in every team*' and potential downside of isolating specialists from one another – "*it's still going to need that kind of matrix management to make sure that those individuals are supported and they're working consistently as well*" (NRW). It will therefore be important to monitor and reflect upon the strengths and weaknesses of the organisational restructuring as it establishes and matures over the next couple of years.

4.4.4. Opportunities to experiment

Under the *Environment (Wales) Act 2016* (section 22), Welsh Ministers have been granted powers to suspend certain provisions in statutory requirements in order to enable experimental schemes that support SMNR. Powers are assigned to NRW to conduct experimental schemes to i) develop or apply new or modified methods, concepts of techniques; ii) develop new management techniques to improve ecosystem resilience; or iii) develop proposals for regulatory change. Demonstrating the success of this, three natural resource management 'area trials' were conducted in 2014 for the Rhondda, Taw and Dyfi river catchment areas (National Assembly for Wales, 2019). Stakeholder and community engagement underscored each of these and informed the implementation of several projects within each area trial. For example, in Rhondda a project for 'working with nature to restore the natural water environment' saw the restoration of upland peatland (at Cwmparc), as well as installation in-channel woody debris and brushwood fascines to deliver flood attenuation, carbon storage, water quality and biodiversity benefits (NRW, 2016c).

The area trials have illustrated the added benefits of adopting an area-based approach, engaging a wide range of stakeholders and delivering cost-effective, multi-purpose solutions. However, NRW have also highlighted the challenge of quantifying the benefits of nature-based approaches and uncertainties in evidence. This call for more evidence to support the implementation of novel and innovative catchment-based flood approaches, such as NFM measures, is a challenge across the UK (POSTNOTE, 2014). Despite a number of trials and test areas (as described above), scaling up to a national level can be challenging as the benefits of these innovative approaches can take time to be realised and can often be difficult to quantify. In turn, this can inhibit investment and funding, which often demands high levels of certainty (POSTNOTE, 2014). Establishing confidence in new approaches typically requires 3-5 years of evidence and ongoing monitoring to establish their effectiveness at mitigating flood risk, yet NRW remark – "*In the current financial climate, NRW's monitoring network (and capabilities) are likely to be scaled back so capturing this level of data could be increasingly difficult in the future*" (NRW, no date(b)). These tensions were further discussed during the stakeholder workshop (Alexander et al., 2019).

Key learning points:

The *Environment (Wales) Act 2016* has introduced new bridging mechanisms (such as SMNR principles and Area Statements) that have strengthened alignment between FCERM, the environment and Well-being – namely the Resilient Wales well-being goal. This has the potential to increase opportunities for co-delivering FCERM projects and delivering schemes with flood-related benefits through alternative funding sources. However, it will be important to monitor and evaluate the extent to which Area Statements once adopted perform as intended. Translating these opportunities into delivery may require potential barriers to multi-actor working to be addressed – this are discussed further in Section 5.3.

Evidence gaps remain in terms of quantifying the benefits of catchment/area-based approaches, particularly NFM and so-called intangible benefits to well-being. Resources to support periodic monitoring will be essential to establish evidence and confidence in new approaches.

4.4.5. The National Habitats Creation Programme

A vital mechanism for mitigating the impacts of FCERM works is the National Habitats Creation Programme (NHCP). The programme was established in 2009, with the primary aim to provide a strategic approach to the identification and creation of compensatory habitats to offset coastal habitat losses associated with the implementation of SMP2, the FCERM programme and coastal squeeze (Welsh Government, 2018b). The programme is administered by NRW on behalf of Welsh Government and satisfies the requirements of the *Conservation of Habitats and Species Regulations 2017*. In accordance with this legislation (and related EU Directives[40]), plans that are likely to affect the integrity of Special Areas of Conservations (SACs), Special Protection Areas (SPAs) and Ramsar Sites can only proceed if there is no alternative, or if the plan is carried out for Imperative Reasons of Overriding Public Interest (IROPI). In this instance, the appropriate authority must ensure that any necessary compensatory measures are taken to protect the overall coherence of Natura 2000. The SMP2s were progressed on this basis, likewise, providing individual projects adhere to SMP2 policy, it will be justified on the grounds of no alternative and the existing SMP2 IROPI (Welsh Government, 2018b).

[40] Directive 2009/147/EC on the conservation of wild birds (referred to as 'the Birds Directive', codified from original Council Directive 79/409/EEC), and Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (otherwise referred to as 'the Habitats Directive').

The NHCP monitors the anticipated impact of 'coastal squeeze' resulting from FCERM plans and projects, taking into account the latest projections for climate change and sea level rise to inform the scale, location and type of compensatory measures required. Opportunities for intertidal habitat creation are maintained within GIS map layers to support a strategic approach across Wales. This means that RMAs do not need to individually secure compensatory habitat, although grant applications that have considered compensatory habitat sites are favourably considered. Gifts of land can also be made, or provisions for 'rights to flood', to support NRW in their delivery of the NHCP.

The programme applies to new defences or significant enhancements to existing defences, but does not take into account historical flood defences nor the coastal squeeze effects associated with third party assets. Moreover, there is no requirement for coastal RMAs to purchase a marine license for general maintenance works within the original footprint of an existing asset. This invariably means there are some restrictions to the extent to which the NHCP is able to fully offset the effects of coastal squeeze losses. However, Welsh Government have allowed exception clauses for inviting non-RMAs to join the NHCP (as explained in the hypothetical example outlined below), which is seen as a positive step forward.

> "[For example, if] a particular site has got a Network Rail asset running along the back of it, we can work with Network rail in revising options for that site and we could invite Network Rail to contribute to that project because for example there is a, in that case, a good rationale for it because the asset goes close. Now in that case Network Rail could benefit by banking compensatory habitat through a pro rata contribution to the project so if a particular project costs for example £5m and they contributed £1m, they could bank a fifth of that habitat and they could use that in their letter to facilitate their marine licence application for repairs and marine licence applications in the future" (NRW)

However, discussions with NRW and others involved in NHCP schemes, revealed a number of other barriers to the implementation of the NHCP. Firstly, it's important to acknowledge that habitats take time to establish and therefore need to be created in advance of losses, yet sites/projects take a considerable length of time to deliver and are '*proving quite slow and complicated'* to implement (NRW). Ultimately, this comes down to the difficulties of engaging and negotiating across multiple landowners in a legitimate way and significant costs involved in decommissioning assets, as well as maintaining Duties of Care and Public Rights of Way (see quotes below). Related to the latter two points, several interviewees remarked on the reputational risks associated with changing existing land uses – "*nobody likes it … [and] raising this awareness is fraught with risk, reputational risk but I think the reputational risks associated with not taking it forward are also profound*" (NRW). The importance of initiating discussions with local communities and being proactive was also highlighted in lessons from Cwm Ivy (see third quote below).

> "If you're going to realign then for example there is an electricity act that puts obligations on us and duty of care with respect to how much notice we have to give and possibly

> compensation we have to provide to service providers like Scottish Power or the National Grid or interfering with you know their assets" (NRW)

> "[T]he obligations are on the local authority is to bridge that site and potentially implicit with maintaining a right of way could be maintaining the asset which is not in compliance with the requirements for us to develop the site and allow that asset to deteriorate" (NRW)

> "I think it highlighted the need for us to get a little bit more proactive rather than reactive … One thing it did highlight is the issue of things like public access … because the Wales coast path is, had to be diverted and created a lot of uproar and difference of opinion within local authorities as well […] in an ideal world you'd have had the discussions with the local ramblers association, with other stakeholders, in advance … [but] the breach happened in the sea wall very quickly which was great from an implementation of the shifting shores policy and the habitat creations scheme but it was in advance of having in depth stakeholder engagement" (National Trust)

The lack of awareness of SMPs amongst landowners and service providers, as well as conflicting priorities, were also highlighted as recurring issues. While opportunities for working with service and infrastructure providers are essential for delivering the ambitions of the NHCP, numerous interviewees explained the challenges of working across **misaligned planning cycles and diverging priorities**, which necessitate considerably advanced planning. For instance, Network Rail was frequently cited as a potential funding partner; however, their budgets and asset management planning are organised on a 5 yearly-basis. Another important caveat is that Network Rail funding is directed towards maintenance only, and not enhancement of the network. This can create a barrier to partnership working, despite best efforts and a Memorandum of Understanding between Network Rail and NRW (in 2016; see quote 1 below). As indicated in quote 2 below, managing expectations between stakeholders can be challenging.

> "It was always the intention that where we interfaced or overlapped we would give each other knowledge of that and if there were efficiencies to be made, for example if they hadn't planned work and we had planned work in the same area then it was always the aspiration that we would come up with some joint thinking, joint approach to actually managing the assets. That hasn't exactly happened or gone the way I think we each wanted to go but again I think that's just a matter of time… it's priorities again, you know if we want to work on certain assets and it doesn't figure highly in NRW's minds and vice versa" (quote 1, Network Rail)

> "We're a public body, we spend taxpayers money and we have to account for it…I don't think people understand that, they still see us as a private enterprise…we're awash with money and why aren't we contributing to a flood prevention scheme …and it's very difficult to justify what we can spend our money on and what roles we can play […] So the money we're going to get now in [control period] CP6 is purely to manage the infrastructure as it stands… we're not covered to spend money on other people's assets, we're not covered to spend money on enhancements or improvements […] it's the perception perhaps that we're being obstructive, uncollaborative and we're actually not" (quote 2, Network Rail).

These barriers significantly slow the pace with which projects within the NHCP can be delivered, which in turn could threaten the ability to keep pace with sea level rise – "*The*

programme has to deliver habitat ahead of sea level rise… that's where the problem lies" (NRW). It is important to stress that this not only has implications for ensuring compliance with the Birds and Habitats Directives, but has additional knock-on effects for the other ecosystem services provided by such habitats and various implications for the well-being of Wales (see Section 5). Within the last reporting period, NRW invested ca. £650,000 through the NHCP providing biodiversity gains of 15.3Ha and supporting opportunity appraisals that could result in an additional 80Ha of habitat improvement/creation over the next 100 years (NRW, 2016d). Beyond biodiversity, intertidal habitats serve as a vital form of protection against flood and coastal erosion risks, forming natural buffers against the effects of coastal storms and erosion (Möller et al. 2001; 2014; Shepherd et al., 2011; Stark et al., 2015; Burgess-Gamble et al., 2017). Under certain conditions, it is estimated that an 80m width of saltmarsh can reduce the height of the defences from 12m to 3m resulting in capital cost savings of £2,600–4,600 per metre of seawall (ASC, 2016). Saltmarshes also play a key role in carbon sequestration, a service considered crucial to ongoing climate change mitigation (e.g. Beaumont et al., 2014). However, this is arguably overlooked – "*When it comes to the losses from coastal squeeze effecting carbon sequestration it's affecting the balance and it's actually something that's not calculated necessarily when you start talking about balancing the budgets in relation to carbon capture and storage and the emissions agenda*" (NRW).

At this current point in time, the NHCP serves as both a strength and current weakness in governance. Overcoming the barriers identified will be essential for maximising ecosystem resilience, addressing documented declines in coastal margin habitats (MEA, 2005) and offsetting 'coastal squeeze'. The latter is already impacting the integrity of the Natura 2000 network and it has been estimated that ca. 2,300 hectares of Natura 2000 coastal habitat will be lost by 2100 (ASC, 2016). Indeed, the loss of coastal habitats, such as saltmarshes, is identified as a key risk posed by climate change and sea level rise, with *implications for the long-term viability of coastal defences and the communities they protect* (CCC, 2016: 38). Ongoing monitoring through the NHCP, the newly created Wales Coastal Monitoring Centre (WCMC) and Coastal Groups is essential, in order to ensure that the NHCP remains 'in credit' and keeps pace with recorded habitat losses.

Key learning points:

The National Habitat Creation Programme (NHCP) is an essential mechanism for providing compensatory habitat to offset the impacts of the FCERM programme and coastal squeeze processes. Such habitats offer a wider range of ecosystem services and benefits, such as biodiversity gains, natural forms of flood and erosion protection, and carbon sequestration to name a few.

There are restrictions to the NHCP (e.g. 3rd party assets) which may limit its capacity to fully offset anticipated losses from coastal squeeze. Moreover, numerous barriers to its implementation have been identified - related to working with multiple landowners (with different priorities, planning horizons and remits of responsibility); navigating legal duties to maintain public rights of way and duties of care; reputational risks; and lack of awareness of the implications of SMP2 amongst land/asset owners. In order to keep pace with sea level rise, these barriers will need to be overcome.

4.4.6. "Shifting Shores" through the National Trust

The National Trust is a key landowner in Wales, with 775 miles of coastline and 1000 square miles of land currently under the Trust's care (National Trust, 2015b). Although not a formal RMA, the National Trust does attend the Wales Coastal Groups Forum and have been actively involved in FCERM schemes, such as saltmarsh restoration at Cwm Ivy (Box 4.4). This research therefore examined how the Trust's land use management policies intersect with FCERM.

There are considerable strengths in this regard, particularly in terms of supporting ecosystem resilience and the Resilience well-being goal (discussed further in Section 5.2.2). In its current strategy, the Trust recognises its part to play in *actively adapting [and] managing coastal change* as well as championing the importance of nature (National Trust, 2015a). Since the publication of its landmark policy "Shifting Shores" in 2005, the Trust has been committed to working with natural processes and coastal adaption, accepting the need to rollback or accept the loss of certain assets where it is no longer sustainable to maintain coastal defence and accepting that - "*increasingly we must view adaptation as having an equal role in the long-term health of the coastline*" (National Trust, 2015b: 6).

Box 4.4: Habitat creation at Cwm Ivy Marsh, North Gower

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The Cwm Ivy habitat creation project is a joint initiative between NRW and the National Trust (the landowner). The project aims to create 39 hectares of new compensatory saltmarsh habitat to offset future losses associated with FCERM works and coastal squeeze within the Carmarthen Bay Special Area of Conservation (NRW, 2015b). The project was initiated when the existing sea wall that enclosed the lowland fen meadow and freshwater marsh of Cwm Ivy suffered a natural breach in 2014. In line with SMP2 policy of No Active Intervention, it was decided not to repair the breach but instead enable saltmarsh habitat to establish by creating additional breaches to the embankment to improve the tidal exchange.

However, this preferred approach is incompatible with City and County of Swansea's (CCS) duties as a Highways Authority to maintain the Public Right of Way of the sea wall. Objections were also raised by users of the path who have argued that that path should be reinstated. This means that further action at Cwm Ivy has stalled. The CCS intend to carry out an options assessment for access to determine whether to repair the existing breach. In the interim, NRW, the National Trust and CCS have agreed that no active intervention will be taken.

In "*A shared purpose for our countryside*" the Trust outlines its commitment over the next 10 years to restoring the natural environment and prioritising nature and landscapes, as originally outlined in the *National Trust Act 1907* (National Trust, 2017). Moving beyond the formal boundaries of its Estate, the Trust recognises the importance of being actively involved in catchment-based approaches, partnership working and working with its tenants to enhance the ecological condition of designated sites, as well as committing to use 10% of its land to create or restore 25,000ha of wildlife habitat. Coastal adaptation is framed as '*a positive force for good*', requiring innovation and '*courage to try out new ideas'*.

However, there are barriers to implementing adaptative-based approaches, which echo those discussed in previous sections. Interviewees discussed the challenges of overcoming Public Rights of Way and lack of mechanisms for rolling-back the Wales Coastal Path for instance. Likewise, the Trust have called for national policy to support adaptive coastal change management, alongside measures to monitor the progress of implementing SMP (National Trust, 2017). Moving forwards, it will be essential to address these points if FCERM is to realise its ambition for developing and maintaining partnership-working in the future.

4.5. Spatial planning & FCERM

4.5.1. A plan-led system - Overview

Terrestrial spatial planning plays a pivotal role in determining the exposure of people and property to sources of environmental risk. Land use planning policy is detailed in *Planning Policy Wales* (PPW, Welsh Government, 2018c) and supplementary Technical Advice Notes (TANs), as well as Circulars and policy clarification letters for procedural guidance. Circulars and TANs are expected to be taken into account in the preparation of development plans, as well as often forming material considerations in the approval of planning applications. Welsh Government act as the overarching policymakers, with responsibilities for developing national policy, legislation and guidance. Although all planning decisions must adhere to the general principles and strategic direction outlined by Welsh Government, land use planning decisions are largely taken at the local scale by Local Planning Authorities (LPAs), of which there are 25 LPAs in Wales.

Wales adopts a hierarchical plan-led approach, such that all development plans must be prepared in accordance with national planning policies (Welsh Government, 2018c). There are three tiers of statutory development plans[41], including the;

- **National Development Framework (NDF)** – Welsh Ministers are required to prepare the NDF, outlining national priorities and setting the strategic direction for development and land use issues of national significance over a 20-year period (subject to 5-yearly reviews, from 2020 to 2040). The NDF will replace the current *Wales Spatial Plan* (Welsh Assembly Government, 2008). Key challenges and priorities within the NDF (currently under consultation) include the delivery of affordable housing, transport and travel across Wales, reducing poverty and inequality, supporting ecosystem resilience, as well as addressing climate change and managing Welsh coastal areas for the risk of increased flooding and coastal erosion (Welsh Government, 2019i).

- **Strategic Development Plans (SDPs)** – Designated strategic planning areas (reflecting functional areas) form the basis for regional scale planning to address regional matters (such as housing markets, travel to work patterns and economic opportunity areas).

- **Local Development Plans (LDPs)** - At the local scale, each Local Planning Authority must prepare an LDP for its area (county council, county borough council or National

[41] Procedural guidance on the preparation of SDPs, LDPs and PPs is outlined in the Development Plans Manual. The consultation for Edition 3 closed in August 2019.

Park)[42], to outline a vision for how places are expected to change and giving an indication for the type of development that will be permitted in certain locations. In addition to statutory planning, non-statutory **Place Plans** may also be initiated by local communities and act as supplementary planning guidance for delivering the LDP.

The development of these plans is guided by 5 key principles in planning, which form the *national sustainable placemaking outcomes*. This includes i) sustainable economic growth, ii) making best use of resources, iii) facilitating accessible and healthy environments, iv) creating and sustaining communities and v) maximising environmental protection and limiting environmental impact. Each plan is required to *consider* the scale at which it can contribute to achieving these outcomes; thus, there is recognition that not every development or policy proposal will be able to demonstrate that they can meet all of these (Welsh Government, 2018c: 19). The concept of '**placemaking**' is a central tenet of PPW. This is defined as an inclusive process (involving those with professional and personal interests in the built and natural environment) to create sustainable places and maximise well-being. Therefore, community engagement and '*collective, participatory approaches'* (i.e. beyond the statutory minimum) are seen as essential for achieving sustainable places (Welsh Government, 2018c: 19).

4.5.2. Development and flood risk - Overview

Flooding is a material consideration in spatial planning and specific guidance for flood risk (fluvial, coastal and surface water) is outlined in Technical Advice Note (TAN) 15 "*Development and Flood Risk"* (Welsh Assembly Government, 2004). This guidance is intended to inform development planning as well as decision-making for planning applications. In October 2019 a revised TAN 15 was published for public consultation (due to close in January 2020) – until this is formerly adopted, the current TAN15 (published in 2004) remains in place, therefore this section firstly considers the strengths and weaknesses of the current approach, before turning its attention to proposed changes.

The existing TAN 15 (2004) adopts a precautionary approach intended to steer new development away from at-risk areas. Development approval is determined by i) zones of flood likelihood (as outlined in Development Advise Maps) and ii) the classification of development according to its vulnerability (Table 4.2). Proposed developments are classified according to their vulnerability[43]; a highly vulnerable development is described as a development where the ability of occupants to decide on whether they wish to accept the risks to life and property associated with flooding, or be able to manage the consequences, is limited (Welsh Assembly

[42] This is mandated in the *Planning and Compulsory Purchase Act 2004* (S62) and the *Town and Country Planning (Local Development Plan) (Wales) Regulations 2005.*

[43] In mixed use proposals, the vulnerability of the development is defined by the most vulnerable use (Welsh Assembly Government, 2004: 7).

Government, 2004: 7). Highly vulnerable development and emergency services *should not* be permitted in Zone C2 (Welsh Assembly Government, 2004: 8).

While new development is directed towards Zone A or Zone B, it is possible for development to occur in Zone C. In such cases, a Flood Consequence Assessment (FCA) must accompany planning applications (see section 7 in Welsh Assembly Government, 2004). For approval to be granted, developers must satisfy a 'justification test', which includes a number of conditions related to the acceptability of risk and associated consequences. For instance, flood defences must be structurally adequate, future maintenance costs for flood mitigation measures and defences must be accepted by the developer and agreed with NRW, and the developer must ensure measures are in place to support risk awareness, effective flood warnings and arrangements for emergency response. Moreover, the development must not contribute to flooding elsewhere. Indicative acceptable thresholds are outlined for different types of development (taking into account depth, rate of rise, speed of inundation and velocity), though the general advice from NRW is that developments should be flood free during the 1% fluvial flood and 0.5% coastal flood (with higher standards of protection requested for emergency services), over the lifetime of the development (i.e. 100 years). Successful applications are therefore contingent on the ability of the developer to reduce the consequences to an acceptable level. In turn, developers must bear the costs of construction, mitigation measures and any long-term maintenance requirements up to 30-years[44] (after which time, such measures may be classed as a public asset); unless said works deliver wider societal benefits, in which case it may be possible to establish a funding agreement with the operating authority.

Section 6 of TAN15 outlines justification criteria for determining the location of development and calls for a 'balanced judgement' between addressing flood risks '*whilst recognising the negative economic and social consequences if policy were to preclude investment in existing urban areas, and the benefits of reusing previously developed land*' (Welsh Assembly Government, 2004: 8). Subject to the criteria that must be satisfied within the flood consequence assessment, development in Zone C can be justified if it is deemed necessary for regeneration, sustaining existing developments, contributing to employment objectives and providing it concurs with the aims of PPW and meets the definition of previously developed land.

[44] An agreement between the planning authority and developer may be made under Section 106 of the *Town and Country Planning Act 1990*.

Table 4.2: Key classifications for spatial planning in flood risk areas

Flood zone categories	Development categories
Zone A – Little or no flood risk	▪ **Emergency services** – e.g. hospitals, ambulance / fire / police stations; ▪ **Highly vulnerable development** – e.g. residential premises, schools, libraries, leisure centres, power stations, waste disposal sites; ▪ **Less vulnerable development** – e.g. commercial and retail development, transport infrastructure, car parks, mineral extraction sites
Zone B – Known to have flooded in the past. Generally suitable for most forms of development providing site levels are above the extreme outline (1 in 1000-year river, tidal or coastal flood).	
Zone C – based on the extreme flood outline (1 in 1000-year river, tidal or coastal flood). A **Flood Consequence Assessment** is required for any proposed development. **Zone C1** – floodplain has already been developed and is served by significant infrastructure, including flood defences. **Zone C2** – floodplain without significant flood defence infrastructure. Development is permitted only if certain requirements are met.	

4.5.3. Development and flood risk - Strengths & weaknesses

A key strength of the current system is the coherence of the planning framework and presence of governance mechanisms (including policy triggers within the DAM, and justification and acceptability tests) to divert development away from flood risk areas. There are also numerous 'checkpoints' through which to monitor and advise on flood-related matters. Firstly, pre-application discussions are encouraged within *Planning Policy Wales* and LPAs have a statutory duty to provide a pre-application service to those requesting it[45] (Welsh Government, 2017m,n). For major developments[46], developers must undertake a statutory pre-application consultation[47] with the community and specialist consultees[48]; under this provision, NRW must be consulted about major developments proposed for flood zone C2 or flood zone C1, where emergency services or highly vulnerable development are proposed. Such pre-application services are seen as useful for determining the likely success of a planning application and the necessary conditions that must be satisfied, as well as providing early advice on the potential consequences and scope of the FCA (Welsh Assembly Government, 2004).

[45] Under amendments to the *Town and Country Planning Act 1990* (section 61Z1) brought in by the *Planning (Wales) Act 2015* and *The Town and County Planning (Pre-Application Services) (Wales) Regulations 2016*.

[46] Major development is defined in the *Town and Country Planning (Development Management Procedure) (Wales) Order 2012* (Article 2), including – housing developments of 10 or more dwellings or where the site area is of 0.5 ha or more (if the number of dwellings is not known); the provision of a building(s) where the floorspace created exceeds 1,000 sqm; the winning and working of minerals or the use of land for mineral-working deposits; waste development; and development carried out on a site of 1ha or more.

[47] Under amendments to the *Town and Country Planning Act 1990* (section 61Z) brought in by the *Planning (Wales) Act 2015.*

[48] As outlined in Schedule 4 of *The Town and Country Planning (Development Management Procedure) (Wales) Order 2012*, as amended by *The Town and Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016.*

In deciding whether to grant a planning application, LPAs are not formerly required to adhere to NRW advice, however according to an NRW-administered survey in 2016, 80% of LPAs regarded NRW advice as a determining factor in their decision-making (NRW, 2016d). Research has further found that flood risk is given sufficient weighting in the decisions taken by planning inspectors (see JBA, 2017). Further safeguards are in place through the call-in powers of Welsh Government[49] and Notification Directions. For developments pertaining entirely to flood zone C2 (incorporating highly vulnerable development or emergency services), there is a notification requirement for LPAs to refer applications to Welsh Ministers in instances where they are minded to grant planning permission (under the *Town and Country Planning (Notification) (Wales) Direction 2012*). To date, this has applied to residential developments of 10 or more dwellings (Welsh Government, 2012); however, it is anticipated that this will change to ensure Ministers are notified and can use the call-in process for one dwelling or more located within flood zone 3 (see next section). Not only does this add an additional layer of scrutiny to the planning process, but it is hoped that this will foster behaviour change – "*if they [LPA] do grant it then we've got that call in process...hopefully we change behaviours and don't allow that to happen in the first place*" (Welsh Government).

There are, however, notable weaknesses within TAN 15 and aligning development with FCERM objectives. Firstly, TAN 15 does not give equal consideration to *all* sources of flooding but predominantly addresses fluvial and coastal flood risks, with limited attention to surface water. Surface water is also excluded from the Development Advice Map (DAM), but held within a separate dataset (namely NRW's *Risk of Flooding from Surface Water*). A recent evaluation of TAN 15 carried out by JBA, showed that this situation is causing confusion about whether surface water risks should be included within the FCA and LDP. The evaluation also highlighted weaknesses with the DAM, which uses different flood zones and thresholds to NRW's Flood Map (e.g. zone C is based on NRW's flood zone 2). Consequently, there is a misalignment in the consideration of flood risks, whereby (Strategic) Flood Consequence Assessments are based on NRW flood maps, while the DAM remains the primary trigger for initiating the justification and acceptability planning tests. However, the DAM is based only on the extreme outlines for fluvial and coastal flooding and therefore overlooks potentially other significant sources of flood risk, or future changes to those risks. Another criticism of the C1/C2 designations, it that areas benefitting from defence infrastructure (zone C1) may be granted planning permission, yet this overlooks the risk of defence failure or over-topping and inherent residual risks that remain.

[49] Under Section 77 of the *Town and Country Planning Act 1990*.

Although planning authorities and developers are required to *take account of* the potential impact of climate change over the lifetime of development, climate change is not included within the DAM. To ensure that developments[50] are able to withstand the increasing effects of climate change, a Circular was issued in 2016 to provide guidance on climate change allowances for planning purposes (CL-03-16, enacted from 1st December 2016; Welsh Government, 2016f). This specifies the use of projected increases in peak river flows and sea levels, within Flood Consequence Assessments. These allowances (and associated impacts) must be considered over the lifetime of the proposed development, as well as within development plan allocations, with the view that this will '*allow for development proposals to incorporate design measures that help manage that risk and improve resilience'*. Allowances are currently based on the UKCP09 data, with figures provided for three epochs of time (2020s, 2050s and 2080s), though it is anticipated that these will be updated with the recent UKCP18 projections. The inclusion of climate change projections is a key strength in current governance, but its absence from the DAM and the requirement to *'take account'* of these, only, is arguably very weak and misses an opportunity to embed and join-up these concerns. Indeed, one interviewee remarked – "*the local development plans are being developed and at the moment there's no allowance for climate change in them so we're not really joined up on all of these things*" (NRW).

TAN 15 has been widely criticised for its general lack of assertiveness when it comes to planning approval. The document aims 'to *advise caution in respect to new development in areas at high risk of flooding by setting out a precautionary framework to guide planning decisions"* (Welsh Assembly Government, 2004: 3). It further states that highly vulnerable development and emergency services *should not* be permitted in Zone C2. However, 'should' is open to interpretation (JBA, 2017). Information on the number of planning permissions granted or refused in Zones C1 and C2 is collected as part of the planning performance indicators (SD4 "*resilience to climate change-flood risk*"[51]) and returned by LPAs on an annual basis to Welsh Government. A recent analysis of this indicator, suggests a rise in planning permissions granted in zone C, including a very small number of applications that were granted planning permission despite not meeting all requirements of TAN 15 (see Appendix B1.4 in JBA, 2017). However, monitoring these figures is made difficult by the fact that not all LPAs consistently return this information.

Another significant weakness in the current governance arrangement is the neglect of coastal matters in TAN 15, such as erosion risks and future changes to risks (as outlined in SMP2), which are not recorded within the DAM. Coastal planning is addressed in TAN 14 (Welsh Office, 1998), which calls for careful consideration of coastal risks such as flooding, and for specific

[50] The assumed lifetime of a residential and non-residential properties is 100 years and 75 years, respectively.
[51] Information is recorded on the number of residential units and area of land (ha) for non-residential purposes.

policies to restrict development in low-lying coastal areas, on land close to eroding cliffs or other eroding coastlines, or on land subject to instability. Paragraph 14 asserts the need for coordination between land use planning and strategies for flood and coastal defence, with regard to the SMP, but the guidance is now considerably outdated and makes no reference to climate change or indeed TAN 15. Within TAN 15, LPAs are instructed to '*take account of*' SMPs and are *strongly discouraged* from allowing further development in low-lying areas where the preferred option is towards managed realignment or no active intervention (Welsh Assembly Government, 2004: 39). For areas subject to managed realignment, development plans *should* include specific policies for managing development. Where coastal development is required, especially within coastal change areas, there is an expectation that it should be resilient to the effects of climate change over its lifetime and only approved if risks can be acceptably managed (Welsh Government, 2018c). However, there was a concern amongst some interviewees that SMPs are not fully considered within spatial planning, particularly due to their non-statutory status.

Other research has also revealed limitations in terrestrial spatial plans and limited reference to SMPs, ideas of Integrated Coastal Zone Management or awareness of coastal groups/partnerships (Ballinger, 2016). Similarly, under PPW 2018 planning authorities *must consider* the land use implications of the Welsh National Marine Plan (WNMP) (Welsh Government, 2018c: 81). There is an expectation that the WNMP and development plans should complement one another and facilitate integrated coastal zone management, yet the extent to which this is achieved is being called into question. This is discussed further in Section 4.11.

Considerable advancements have been made within FCERM since the original adoption of TAN 15, including developments in flood risk modelling (from all sources) as well as legislative and policy changes, which have cemented a risk-based approach to FCERM and altered roles and responsibilities. To reflect these changes, the evaluation by JBA (2017) called for greater integration of flood and coastal erosion risks and application of the source-pathway-receptor-consequence model of thinking to the planning framework to establish a risk-based approach. Many of these recommendations have been addressed through the proposed reforms to TAN 15, outlined below.

4.5.4. Proposed changes to TAN 15

The revised TAN 15 (currently under consultation) is entitled *Development, flooding and coastal erosion* and assimilates the now-out-dated TAN 14 "Coastal Planning" (see Welsh Government, 2019j). The key changes can be summarised as follows:

- TAN 14 will be assimilated into TAN 15, to provide a combined framework for river, coastal (flooding and erosion) and surface water;

- Move towards a risk-based (as opposed to precautionary) framework, with a stronger stance against the consideration of highly vulnerable development in high and medium risk areas (zone 3), and development policies to reflect different degrees of risk;
- The Development Advice Map will be replaced by a Wales Flood Map (maintained by NRW) to indicate different risk zones, including very low risk (zone 1), low risk (zone 2) and medium and high risk (zone 3). This will include surface water mapping, areas benefitting from flood defences (linked to National Asset Database) and climate change allowances;
- Changes to development categories, with additional types of developments and land uses added to the guidance, including a new category for '*water compatible development'* – i.e. developments which are required to be in a fluvial, tidal or coastal location by virtue of their nature, and developments which are resilient to the effect of occasional flooding (e.g. boatyards, marinas, development associated with canals etc.). It is for planning authorities to determine the vulnerability of land uses;
- Further guidance on Justification and Acceptability test;
- New advice on flood resilient development and site and property-level resilience measures;
- Stronger emphasis on the need for comprehensive Strategic Flood Consequence Assessments to inform Development Plans.

The proposed changes to TAN 15 address many of the weaknesses outlined in the previous section and the recommendations following JBA's evaluation of TAN 15 in 2017. For instance, the shift towards a risk-based framework will help ensure a holistic approach is taken to account for all sources of flooding in development planning and decision-making. Furthermore, the decision to replace the DAM with a Wales Flood Map, including surface water risks and climate change, will support a more cohesive and consistent approach. FCAs will also be required to consider a range of climate change scenarios, including upper end estimates (Welsh Government, 2019j: 8). In contrast to the current TAN 15, the threshold frequency to which new developments must be designed to be 'flood free' now includes allowances for climate change, alongside more assertiveness that these frequency thresholds '*must be met for different types of development*' (p25). This is a stark contrast to the indicative guidance currently provided, and further embeds and integrates climate change into terrestrial spatial planning.

A conscious effort was also made within Welsh Government to try to align the consultations for TAN 15 and the revised National FCERM Strategy (Welsh Government, 2019a: 14). This has helped forged a closer alignment between the principles of TAN 15 and the Strategy, particularly with regards to minimising future exposure (objective D in the Strategy), while also enabling resilient development where appropriate. While the current TAN 15 encourages the use of flood *resistant* design features (included within the acceptability criteria), the revised document strengthens the emphasis of *resilient* design at both site and property-level,

especially for developments located within zones 2 and 3. In addition to alleviating exposure to flooding, the use of Sustainable Urban Drainage Systems (SuDS) in particular is highlighted as an opportunity for providing wider well-being benefits (discussed further in Section 4.6); thereby establishing greater connectivity between FCERM, spatial planning and well-being agendas.

A new section has also been added outlining the requirements for Strategic Flood Consequence Assessments (SFCA) to inform policies and site selection processes for both SDP and LDPs. Although most LPAs reported undertaking a Strategic Flood Consequence Assessment (SFCA) to help inform the LDP (NRW, 2016d), research has shown these to be highly varied to-date across LPAs (JBA, 2017). Removing some of the obscurity in current TAN 15, the revised TAN 15 clearly states that SFCA are expected to consider all sources of flooding and draw from a range of sources, including the Flood Risk Assessment for Wales, FRM Plans, SMPs and Area Statements. This is a vital step forwards towards better-integrated planning across terrestrial and coastal systems and may further support the identification of opportunities for managing flood risks at local and regional scales (as observed in NRW, 2016d). To reinforce this, the document explicitly states that options for Natural Flood Management and managed realignment should be included within the SFCA and proposals clearly outlined in the Development Plan (Welsh Government, 2019j: 14). The value of working across LPA borders to produce SFCA is also highlighted – "*a SFCA which covers a river catchment area may be more effective and efficient*" (Welsh Government, 2019j). This was further discussed by Welsh Government during the interview process – "*Ideally on a joint basis, over a catchment basis […] a good SFCA can really help you identify areas that can grow sustainably, areas where we can bring in creative solutions that can have bigger multiple benefits*" (Welsh Government). In this sense, the SFCA is seen as a vehicle for shifting the focus away from development management, towards a greater emphasis on development planning to provide "*more certainty, ten and twelve year plans, setting out areas of growth, areas of change, areas of protection on the coast, areas of managed realignment*" (Welsh Government).

In the production of the SFCA, the consultation document states that the views of key stakeholders such as emergency planning teams *should* be sought, as well as the views of insurers. Furthermore, LPAs *should* engage with RMAs to support assessments of risks and consequences in high and medium risk areas, during the site selection process and development of local planning policies more widely. These engagement mechanisms are essential for addressing and aligning priorities across different policy sectors (spatial planning, civil contingencies and FCERM). However, there is a potential gap with regards to engagement with Coastal Groups, which are not explicitly mentioned. Indeed, the lack of awareness of SMP2 (Section 4.3) has been problematic to-date, although SMP2 have arguably gained '*more traction in the planning system*' compared to the first generation SMPs and have been increasingly cited and taken into account in LDPs according to Welsh Government – "*Bringing in coastal considerations into TAN 15 and eventually getting rid of TAN 14 will strengthen that*

as well" (Welsh Government). Nonetheless, it may be necessary to explicitly encourage engagement with Coastal Groups in order to better-bridge coastal management and spatial planning, and strengthen the role of spatial planning in adaptation.

There is also a need to address the relationship between terrestrial spatial planning and marine management. For instance, an SFCA is expected to draw from a range of evidence, however the Welsh National Marine Plan[52] (WNMP) is notably absent from the list provided, thus highlighting a potential gap. Although Planning Policy Wales states that planning authorities must consider the land use implications of WNMP, this should arguably be reasserted in TAN 15 to promote integrated management. However, the revised TAN 15 does offer the following statement – "*planning authorities should be mindful that development on the terrestrial part of the coastal environment has the potential to generate both on-shore and off-shore coastal impacts. Planning authorities should collaborate with relevant marine authorities to ensure the effects of land use planning are beneficial to, and do not damage, the overall coastal environment*" (Welsh Government, 2019j: 19). This is a marked improvement over the current TAN 15 and demonstrates a growing recognition of the need to join up activities across the land-sea interface (discussed further in Section 4.11).

The consultation further attempts to clarify the presumption against highly vulnerable development in high risk areas and explicitly states that "*allocations for residential and other highly vulnerable development should not be made*", and applications for less vulnerable development "*should only be made only in exceptional circumstances*" (Welsh Government, 2019j: 14). In this context, exceptional circumstances refer to development regarded to be essential for regional or national employment objectives, or for the provision of key transport or utilities infrastructure. Arguably, this leaves a potential loophole in current planning policy which might enable continued development in high risk areas and circumvent risks for the future. To some extent, these concerns may be partly alleviated through some of the proposed changes in TAN 15. For instance, it is made clear that NRW are under no requirement to respond to internal consultations or FCAs referring to highly vulnerable development in zone 3. Furthermore, there is a much stronger emphasis on the inclusion of SMP2 and National Coastal Erosion Risk Map for development planning in coastal areas, and specification that '*planning authorities must ensure co-ordination between land use planning and strategies for flood and coastal defence'* (Welsh Government, 2019j: 20). Regeneration in large urban areas at-risk of flooding will also be subject to scrutiny at national and regional scales through the NDF and SDPs. However, the success of these mechanisms will depend on their uptake in practice – as discussed in Section 4.3 awareness of SMP2 has been lacking to-date, while resource

[52] The first Welsh National Marine Plan was published on the 12th November 2019.

constraints in the public sector continue to undermine opportunities for effectively coordinating and integrating activities. These barriers must be addressed moving forwards.

Key learning points:

The current planning framework includes important governance mechanisms (e.g. justification and acceptability tests) for diverting development away from flood risk areas; however, the current Technical Advice Note 15 (*Development and Flood Risk*) is severely limited. A range of weaknesses exist, particularly in terms of the focus on fluvial and coastal flooding and lack of integration with TAN 14 (*Coastal planning*), as well as the limitations of the Development Advice Map.

The proposed changes outlined in the current consultation of TAN 15 (*Development, flooding and coastal erosion*) address many of the current weaknesses and (if accepted) will offer better integration across terrestrial and coastal systems. However, some potential gaps exist in relation to the development of Strategic Flood Risk Assessment – engagement with Coastal Groups should be explicitly encouraged in order to better-bridge coastal management and spatial planning, and strengthen the role of spatial planning in adaptation efforts. Moreover, the Welsh National Marine Plan should be cited and referred to as a source of evidence to further join-up thinking across the land-sea interface.

4.6. Surface water management and Sustainable Urban Drainage

Surface water flooding was not the primary focus of this research; however, this section provides a short overview of the current governance mechanisms for surface water risks and relevant findings from the research.

Surface water is addressed through several aspects of FCERM governance in Wales. At the national scale, surface water risks are modelled through Flood Risk Assessment Wales and included within the Wales Flood Map and corresponding Communities at Risk Register, upon which funding for the FCERM programme is based (Section 4.2; Welsh Government, 2019a). At the local scale, surface water management is the responsibility of LLFAs under the *Flood and Water Management Act 2010* (see Figure 2.3), and is included within Local Flood Risk Management Strategies.

Spatial planning mechanisms provide a fundamental pathway through which surface water risks are addressed, with proposals to strengthen this further outlined in the current consultation on TAN 15 (see Section 4.5.4). Mitigating the likelihood and severity of surface water flooding

can be achieved through spatial planning in several ways, including i) site and property-level resilient design (as discussed in previous section) and ii) Green Infrastructure (GI), including Sustainable Urban Drainage Systems (SuDS). The use of GI is outlined in *Planning Policy Wales*, referring to '*the network of natural and semi-natural features, green spaces, rivers and lakes that intersperse and connect places'* (Welsh Government, 2018c: 120). The expectation within the spatial planning system is towards the protection and enhancement of GI to support delivery of '*distinctive and natural places'* - a core theme through which the environmental and cultural components of 'placemaking' are addressed. Local Planning Authorities (LPAs) are expected to perform GI Assessments to map existing GI and draw from Area Statements (when published) and well-being statements to support a coordinated consideration of strategic opportunities to deliver multiple benefits (including flood risk management), ecosystem services and the principles of SMNR. In this regard, planning policy provides the right enabling environment for supporting the goals of FCERM and advancing nature-based approaches.

SuDS have increasingly risen up the planning and FCERM agendas. These represent a suite of techniques, which support a host of benefits, including water (quantity and quality) management, urban cooling, biodiversity, amenity and recreation to name a few. A key governance mechanism for embedding the use of SuDS into spatial planning in Wales was introduced as of January 2019 in the form of **SuDS Approval Bodies (SABs)**, as required by the *Flood and Water Management Act 2010*[53]. Sustainable urban drainage is now treated as an integral part of development design and is applicable to new developments of 1 or more dwellings, or where the area covered equals or exceeds 100 square metres. This decision ensures that the cumulative effect of small developments on surface water run-off is accounted for (Alexander et al., 2016), as well as providing consistency and opportunities for efficiency savings (as indicated in the quote below).

> "Up until January Wales has been … relying wholly on the planning system to deliver SUDS and you know effectively it's been down then to each individual authority, each developer and the negotiating relationship between them and each application, that really isn't a mechanism which is going to deliver consistency and certainty when it comes to sustainable drainage… if you've got certainty about what's going to happen and what you need to do then the extent to which you need to put contingency in the project budget against that, diminishes. So you know you're effectively able to deliver schemes for the lower project budget" (FCE Committee member)

Interim SuDS standards were introduced in 2017 (Welsh Government, 2017i), followed by statutory standards and guidance (Welsh Government, 2018d; 2019e). New developments

[53] Additional secondary legislation includes The Sustainable Drainage (Appeals) (Wales) Regulations 2018; The Sustainable Drainage (Approval and Adoption Procedure) Regulations 2018; The Sustainable Drainage (Enforcement) (Wales) Order; The Sustainable Drainage (Application for Approval Fees) Regulations 2018; The Sustainable Drainage (Approval and Adoption) (Wales) Order 2018.

must comply with these standards and obtain approval from the Local Authority while exercising its functions as a SAB. In turn, the SAB is required to seek the advice of statutory consultees, including the sewerage undertaker, NRW, the relevant local Highway Authority, and the Canal and Rivers Trust; these groups provide the necessary technical expertise required and their advice is a material consideration in decision-making. The LPA is not a statutory consultee and the SAB itself is independent of the planning permission process; however, construction cannot take place without first obtaining SuDS approval. Furthermore, developers are encouraged to consider drainage solutions within the outline planning stage and seek advice from the SAB, the LPA and LLFA at this stage (Welsh Government, 2019e,l). Adoption and management arrangements for SuDS must be further agreed by the SAB before construction can commence. Although it is too soon to evaluate how well this is working in practice, early views are fairly positive – "*early indications are that developers are approaching it sort of openly and they realise, they accept that there can be savings to be made*" (Welsh Government). A review is planned after the first two years to reflect on key lessons (e.g. fees, arrangements within local authorities etc.). Nonetheless, the SAB should promote the integration of SuDS within new developments, as well as providing an additional layer of oversight to ensure that a piecemeal approach to SuDS is avoided.

Efforts have also been made by the **water sector** to address mounting pressures on the sewerage system and resulting increases in surface water flood risks. As a Risk Management Authority, water and sewerage companies have statutory duties (under the *Flood and Water Management Act 2010*) to act consistently with the National FCERM Strategy and with regard to the Local FRM Strategies, as well as duties to cooperate with other RMAs. The behaviour of the water industry is further shaped through Ofwat (The Water Services Regulation Authority[54]) through the five-yearly Price Review (currently PR19). Ofwat's strategic priorities are informed by advice from Government; therefore, Ofwat's draft determinations for Welsh companies[55] are partially assessed against the priorities and objectives set by Welsh Government[56]. Accordingly, priorities for economic regulation in Wales are related to matters of affordability, innovation, *long-term*, markets and competition, *resilience*, strong customer focus, and the *Sustainable Management of Natural Resources (SMNR)* (Ofwat, 2019a). Of particular relevance to FCERM are the requirements for Welsh companies to demonstrate long-term planning, resilience and SMNR within their Business Plans. Although the 2020 – 2025 Business Plans have been subject to criticism (Ofwat, 2019b) and subsequent revision,

[54] Ofwat is a non-ministerial government department that regulates the water sector in England and Wales.
[55] Welsh water companies include Dŵr Cymru Welsh Water (DCWW) and Hafren Dyfrdwy (which was formed in July 2018 to serve all Welsh customers previously served by Severn Trent Water and by Dee Valley Water). DCWW is the primary water and sewerage company in Wales, with some coverage for adjoining areas of England.
[56] Ofwat's final determinations for PR19 will be published following the General Election on 16th December 2019.

in the forthcoming Asset Management Period[57] (AMP7), Welsh companies have committed to investing £8m to improving resilience and sustainability, as well as committing to a 27% and 26% reduction of internal and external sewer flooding incidents, respectively, by 2024-25 (Ofwat, 2019).

However, the extent to which longer-term resilience is supported by Ofwat and prioritised alongside concerns over costs, is questioned. Reflecting on this, one interviewee described the significant improvements that have been brought about by privatisation of the water industry and creation of Ofwat (including environmental benefits), but discussed tensions between Ofwat's pursuit of 'least cost' and long-term environmental objectives (see quote 1, below). This in turn, is perceived as a barrier to delivering 'ambitious targets' set by Dŵr Cymru Welsh Water (DCWW) – "*We have very ambitious targets in terms of reducing the number of flooding incidents that we have, between 2020 and 2025, and less money than we've ever had before to try and deal with it*". This raises an interesting philosophical debate around the value of water and customers' willingness to pay for alternative (and potentially more expensive) approaches, which warrants a national conversation (see quote 2, below).

> "They [Ofwat] are focused pretty much exclusively on least cost. All of their incentive processes are set out to drive costs out of the business whilst either maintaining or increasing customer service. You can say that's great, but the difficulty is that once we start to look outside the five-year horizon at some of the longer-term needs, the types of needs driven by climate change for instance … those sorts of things are very difficult to make economic arguments for in the short-term" (quote 1, DCWW)

> "We need to have a really detailed and engaging debate with customers as to what they're prepared to pay for. Because the one thing I'm absolutely sure of is building more resilient infrastructure to deal with climate change and biodiversity loss is going to cost quite a lot of money. And as it currently stands, the economic regulatory regimes which govern all of that and aren't equipped to make those decisions" (quote 2, DCWW)

Another potential challenge to longer-term planning, resides with the nature of business planning in the water sector, which operates on a 5-yearly cycle. Addressing this, DCWW have published a strategic organisational plan, "***Welsh Water 2050***", which sets out the direction of travel for the next 30 years. This has been highlighted as a positive example of sustainable long-term planning, aligned to the principles of SMNR and well-being legislation (NRW, 2016d; Welsh Water, 2018). Identifying future challenges, including climate change, DCWW outline 18 strategic responses. In turn, each AMP business plan in the future will be required to demonstrate progress towards these, against Measures of Success; thus, embedding long-term goals into shorter-term planning. Of these, DCWW specify the importance of using nature

[57] An 'Asset Management Period' is the five-year period covered by a water company's business plan. These are numbered; with AMP1 referring to the first such planning period after the water industry was privatised (1990 – 1995).

to reduce flood risk and pollution, as well as supporting other statutory requirements under the *Environment (Wales) Act 2016* (namely S6 duty for ecosystem resilience). '**Rainscaping**', through the use of SuDS, is seen as a primary strategy for achieving this. DCWW's 'Rainscape' programme[58] implements a range of SuDS measures (e.g. swales, permeable paving, filter strips, basins and planters etc.) to redirect stormwater away from the sewer network, or by otherwise slowing the flow of water across the catchment. In addition to reducing urban surface water flood risks, the programme provides additional benefits for water quality, habitat creation, amenity and climate resilience. This marks a significant step forward in the delivery of integrated water management (NRW, 2016d). Local scale initiatives, such as "Greener Grangetown", have also been highlighted as examples of best practice, representing effective partnership working (involving City of Cardiff Council, DCWW and NRW), diversified funding (including landfill community funding) and delivery of multiple benefits for well-being (Future Generations Commissioner, 2018a).

Ofwat further expect companies 'to identify and act on the risks of flooding, including the additional challenges created by climate change, and ensure these are reflected in their investment and delivery plans" – including the water resource management plans[59] and the forthcoming Drainage and Wastewater Management Plans (DWMP). The DWMPs are intended to provide a new framework for enabling integrated water management across foul and surface water that favours catchment-based thinking. This is seen as an revolutionary change in the water sector and means of 'unlocking organisational funding constraints' – including opportunities for developing collaborative solutions to flooding and enabling joint-funding (Welsh Water, 2019). The development of DWMP is still in the early stages, but offers promising opportunities for FCERM for the future.

Another final point to observe, is the unique position of DCWW. Unlike other water companies, DCWW is a not-for-profit dividend business, which enables it to re-invest profits 'to improve outcomes for customers and the natural environment' (Welsh Water, 2018). This stands in stark contrast to the rest of the water sector, which satisfies the commercial interests and satisfaction of shareholders as well as customers. Previous research has highlighted the barriers that such models can cause in terms of collaboration, risk aversity and continued investment in traditional grey infrastructure (Alexander et al., 2016). This is not the case in Wales.

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[58] Further information on the RainScape programme can be found from https://www.dwrcymru.com/en/My-Wastewater/RainScape.aspx

[59] Water resource management plans address the need to maintain the supply-demand balance during drought periods.

Key learning points:

The enactment of the *Flood and Water Management Act 2010* has established clearer responsibilities with regards to surface water flood risk management. Surface water risks have been embedded within risk modelling/mapping, Local Flood Risk Management Strategies and FCERM funding. Proposed changes to the governance surrounding TAN 15 ("*Development, flooding and coastal erosion*": Welsh Government, 2019j) will further embed surface water into spatial planning decision-making.

A new governance mechanism has been introduced as of the 1st January 2019 in the form of SuDS Approval Bodies (SABs), which require new developments to adhere to statutory standards and obtain SuDS approval before construction can take place. While it is too soon to evaluate the effectiveness of this mechanism at this stage, SABs have the capacity to further embed SuDS within new developments, while providing an additional layer of oversight to ensure that a piecemeal approach to SuDS is avoided.

The water industry is increasingly embracing integrated approaches to water management. This is partially-promoted through the governance structure (Price Review mechanisms by Ofwat), whereby long-term planning, resilience and the principles of SMNR form part of the assessment of Business Plans; however, the extent to which these are supported by Ofwat and prioritised alongside dominant concerns over costs, is questioned. This raises a philosophical debate around the value of water and customers' willingness to pay for alternative approaches, which warrants a national conversation. Nonetheless, *Welsh Water 2050* marks a key step-change in organisational planning and means of embedding long-term goals into shorter-term Asset Management Periods. 'Rainscaping' and use of SuDS is set to expand, while forthcoming Drainage and Wastewater Management Plans offer considerable promise for delivering integrated approaches to water management at the catchment scale and unlocking opportunities for collaborative working.

4.7. Land use management and agriculture

Agriculture represents an important part of the Welsh economy, as well as the identity and heritage of Wales. However, flooding presents a significant threat to the sector. Current estimates suggest that ca. 16,000ha of Best and Most Versatile (BMV) agricultural land is exposed to a 1 in 75-year risk of fluvial and surface water flooding, accounting for 10% of BMV land in Wales, with a further 2,000ha exposed to a 1 in 75-year risk of coastal flooding (ASC, 2016). Simultaneously, strategic land management can help alleviate the risks of flooding. This is especially pertinent in Wales, given that 88% of Wales' land area is comprised of agricultural land (ASC, 2016).

To date, agri-environment schemes (such as the Glastir programme[60]) have sought to incentivise environmentally compatible land management practices to enhance water quality, biodiversity and flood mitigation. These have typically been delivered through Pillar II of the Common Agricultural Policy (CAP). CAP has been a significant source of revenue for the rural economy, providing ca. £274m each year in direct subsidiaries and payments to ca. 16,000 Welsh farms (Welsh Government, 2017a). In addition, the Welsh Government Rural Communities – Rural Development Programme 2014 – 2020, has been jointly funded by Welsh Government and the European Agricultural Fund for Rural Development. This represents a 7-year investment programme to support various businesses, farmers, the countryside, and communities in rural areas. Certain programmes have been delivered through this, such as Glastir Advanced – a five-year sustainable land management scheme that offers payments for environmental goods and services supporting key environmental aims (e.g. reduced emissions, improved water quality, reduce flood risk, enhanced biodiversity, and climate change adaptation for business resilience and economic sustainability) (Welsh Government, 2019k).

The Glastir scheme has been subject to scrutiny and some criticism. For instance, the Auditor General for Wales (2014) praised the environmental alignment of the scheme, but expressed concerns about the low uptake, target-setting and lack of measures for monitoring success. Similarly, the Public Accounts Committee (2015) voiced concern around maintenance payments in Glastir Advance and recommended that the scheme provide 'genuine improvement in agri-environmental practices', not merely reinforcing existing practice. Ongoing monitoring through the Glastir Monitoring and Evaluation Programme (GMEP[61]) indicate both successes and limitations of the programme. For instance, some improvements have been reported in terms of habitat connectivity and dominance of semi-natural habitat within Glastir land, while differences in the overall condition and habitat diversity appear to be limited. National trends show no change in the majority of Glastir outcome measures, suggesting that the scheme has helped to at least halt declines in biodiversity, alongside some small improvements reported for certain indicators and continued decline in others (GMEP, 2017).

The UK's withdrawal from the EU ("Brexit") will have a profound effect on the agricultural sector in Wales and presents both challenges and opportunities moving forwards. An estimated 1.3 million people currently benefit from the European Agricultural Fund for Rural Development (Welsh Government, 2017a), which will now need to be secured through alternative means. The CAP has provided ca. £300m each year, thus the loss of CAP and Basic Payment Scheme

[60] The Glastir programme was launched in 2012, replacing four existing agri-environment schemes in Wales. The programme is comprised of Glastir Entry, Glastir Advanced, Glastir Commons, Glastir Efficiency Grants and Glastir Woodland,

[61] Glastir Monitoring and Evaluation Programme is led by the Centre for Ecology & Hydrology (CEH)

(BPS) is a profound issue (Welsh Government, 2018e). Indeed, the National Farmers' Union for Wales (NFU Cymru) expressed their concerns over future trade deals and the 'un-level playing field' that will be created with the loss of CAP (see quote below). Simultaneously, NFU Cymru have recognised the potential opportunities of reform and chance to address the detrimental environmental impacts that have been created through the inflexibility and prescriptiveness of CAP.

> "[There are] very, significant challenges for Welsh farming as a result of Brexit…but there are also opportunities to divine a future agricultural policy that better suits the needs of Wales and as its own nation with its own needs […] there is an opportunity to develop that sustainable agricultural brand and get that out there to the world… we've got a positive story to sell" (NFU Cymru)

The "*Brexit and our Land*" consultation received over 12,000 responses (Welsh Government, 2018e), demonstrating the prominence of agriculture in Welsh society. The Consultation proposed a new land management programme, comprising two distinct schemes to deliver economic resilience and public goods. Whereas the introduction of a public goods scheme was praised by environmental groups, the farming community were particularly critical about the seemingly artificial split between food production and land for public goods (Welsh Government, 2019g; see quote 1, below). With this, there was concern that that food production may be 'de-emphasised' and lead to increased reliance on the state (via the public goods route), thus, providing a less economically sustainable scheme. It was also felt that the positives of CAP and BPS, in terms of supporting a large number of farmers and establishing environmental ad animal welfare standards, has been overlooked by Welsh Government. In this regard, the environmental goods already provided by farmers were seen as being downplayed - "*there's an intrinsic link between the action of farming and the landscape looking as it does*" (NFU Cymru).

> "[T]he big risk actually with the *Brexit and our land* proposals as they stood, were that we were going to see the territorisation of agriculture, territorisation of Wales as a result. We were going to see areas designated for the production of public goods and we were going to see areas designated for the production of food […] it seemed illogical that actually the very non- integrated way by which two schemes were being pursued seemed to be only weakening your biggest foundation sector… they go hand in hand" (quote 1, NFU Cymru)

The lack of definition of what constitutes 'public goods' also caused uneasiness and fears that certain public goods such as habitat restoration ultimately require non-interventionist approaches and risk "*farmers being designed out of existence*" (NFY Cymru). In this regard, NFU Cymru were keen to emphasise the much wider knock-on impacts that this would have for rural communities, Welsh culture and language, which risk being overlooked in favour of environmentally-dominated reform.

> "There's impacts to communities, there's impact then as well to particularly our Welsh speaking communities […] it is the language of the business so it's the living language,

> it's kept alive because of farmers […] direct employment in agriculture is up to 28% so if you look at the knock on, it's very, very significant […] what Welsh Government pursued was the development of an environmental policy, they forgot about the rural, they forgot about the people, they forgot about the economy" (NFU Cymru)

On the basis of the consultation responses, Welsh Government published a revised proposal in July 2019 "*Sustainable farming and our land*" which merges the two proposed schemes into a single Sustainable Farming Scheme (Welsh Government, 2019f; 2019g). The premise of the scheme is to couple payments with sustainable land management outcomes to reward services that are not currently recognised through market mechanisms – such as water and air quality, biodiversity, and flood risk mitigation. This is based on the principles of Sustainable Land Management – defined as '*the use of land resources, including soils, water, animals and plants, for the production of goods to meet changing human needs, while simultaneously ensuring the long-term potential of these resources and the maintenance of their environmental benefits*' (United Nations, in Welsh Government, 2019f: 22). Upon successful completion of a Farm Sustainability Review and a Farm Sustainability Plan, active farmers will be able to access two types of financial support, including the *sustainable farming payment* and *business support*. The former will provide a stable income (based on a multi-year contract) and reward both new and existing farming practices, while the latter funding would support business development, capacity and skills to enhance productivity. By offering conditional payments subject to actions, the Sustainable Farming Scheme has the potential to better incentivise a wider range of activities than the universal income support currently offered through the BPS of CAP.

However, the proposed reforms raise practical concerns that will need to be addressed. As discussed by NFU Cymru, this includes practical challenges of calculating multiple outcomes, over different timescales, and delivering bespoke contracts; "*it's balancing what I think is the aspiration against what is practically possible to deliver*". Moreover, it is essential that realistic targets are established – "*farmers really see themselves as a solution, I've got farmers coming to me all the time well yeah I'd plant more, 'I would help government reach its targets', but the targets aren't being framed around something that is accessible to the farm business*". It is clear that farmers' knowledge needs to be placed at the heart of any scheme moving forwards. Nonetheless, overall, we consider the proposals to be an important step-change through which additional flood risk mitigation benefits may be secured. Certain actions in particular have been proved effective at mitigating flood risks, such as floodplain management (e.g. wetland restoration and offline storage areas), woodland management and run-off management techniques (Keenleyside and Old, 2019; Emmett et al., 2019). In this sense, the proposals have considerable potential to strengthen the alignment between agriculture, FCERM and natural resource management, as well as the well-being agenda more widely. Indeed, as one interviewee remarked – "*The opportunity that arises out of Brexit and CAP, for flooding in particular, I think is one of the biggest opportunities that's arisen for the last hundred years*" (DCWW).

Current uncertainty

There remains a strong degree of uncertainty surrounding Brexit and the level of agricultural funding that will be returned to Wales once the CAP ceases. The *Agriculture Bill* was introduced to UK Parliament on 12th September 2018 to provide the legal framework for the UK to leave the CAP. It includes provisions for Wales for phasing out direct payments over a seven-year transition period (2021 to 2027, with powers to extend if required), as well as enabling Welsh Ministers to implement a replacement scheme. However, the Bill's progress has been delayed due to ongoing political debates surrounding a Brexit deal, which meant that the Bill failed to complete its passage through UK Parliament before the prorogue of Parliament on 9th September 2019. This means the Bill will make no further progress at this point in time.

Key learning points:

The UK's exit from the EU and loss of the Common Agricultural Policy (CAP) is seen as an opportunity for offering payments for Sustainable Land Management and delivery of public goods, such as flood risk mitigation, water quality and biodiversity enhancement. This is a significant step-change from the universal income support provided through CAP and could provide a much need governance mechanism to strengthen the alignment between FCERM and the agricultural sector, through which flood risk mitigation benefits may be delivered.

4.8. Community preparedness

Flood preparedness is a growing strength of FCERM in Wales. Over the past decade in particular, considerable efforts have been made to improve flood awareness and increase community preparedness to flooding. Flood risk maps are available online to enable individuals to check their risk from rivers, the sea, surface water and reservoirs, including areas benefiting from defences and flood warnings. Significant efforts have also been made to increase the uptake of flood warnings and coverage of flood warning areas (NRW, 2016d). Building on the opt-out service developed in 2010 (an automatic landline registry for those in high risk areas), further arrangements have been made with mobile network providers to automatically enrol telephone numbers to the floodline service (NRW, 2017c); resulting in ca 40,000 additional addresses receiving direct flood warnings (as of March 2017).

NRW's **Flood Awareness Wales** campaign has been a central pathway for enhancing preparedness since 2010, and has increasingly worked alongside LLFAs to involve local communities, businesses and schools in the production of community flood plans. Templates for producing these are available (NRW, no date (a)), alongside advise for what to do before, during and after a flood event (NRW, 2010). Within the last reporting period, 342 flood plans

had been produced through partnership working between NRW, LLFA and 280 volunteers (NRW, 2016d).

An independent review of Flood Awareness Wales was carried out in 2015 by Collingwood Environmental Planning Limited, drawing from survey and interviews with flood plan volunteers and professional stakeholders. The review commended the targeted and flexible approach taken by Flood Awareness Wales and usefulness of the templates and processes in place to support community flood planning. While the model for engagement was generally regarded to be effective, the resource-intensiveness of the process was highlighted by NRW, amid concerns about the impact of resource constraints on the ability to support this type of activity in the future. Despite recognising the value of partnership working, the research indicated that certain partners were reluctant to take on additional roles in this area, with certain organisations maintaining that NRW should continue to take on a leading role (CEP, 2016). The report made several recommendations, such as reviewing approaches to community flood planning, targets of assessment and resources for engagement.

Addressing these recommendations, the National Flood Forum (NFF) and CEP were commissioned to conduct a *Wales Sustainable Communities Pilot* study to establish flood groups in three selected Welsh communities (NFF and CEP, 2018). Crucially, the research demonstrated the added value of shifting the emphasis away from outputs (e.g. the production of community flood plans, sign-up to flood warnings etc.) and instead focusing on the *process* of community engagement (see quote below). Key conditions were highlighted, pertaining to the independence and credibility of those carrying out engagement initiatives, their commitment to empowering and building capacity within communities to take actions, alongside an appreciation of relationships (including those between people and peoples' relationships to place). Such an approach is inherently resource intensive; thus, the report recommended focusing on locations facing significant risks, or hard-to-reach communities. The importance of investing in 'upstream engagement' was emphasised with the need to re-think how progress is measured and assessed.

> "[E]verybody makes the mistake … they go in and say to a community look we want you to do this, we want you to become more resilient, we want you to do x, y and z and the community isn't necessarily prepared for that, they haven't been through the basics of building a group, haven't got the systems in place or governance in place, they don't actually understand who the people are, who the organisations are, they don't understand what the relationships are […] [there's] a need to build, that stage one process … so that you can have effective partnerships" (NFF)

However, there arguably continues to be a dominant emphasis placed on the improving the consistency of flood information. For instance, accepting the recommendations of the Auditor General for Wales (2016) and the Public Accounts Committee (2017), the revised National FCERM Strategy request that NRW make improvements to the online flood information and flood maps by Spring 2020 (measure 11: Welsh Government, 2019a). Whilst preparedness

and resilience building are an explicit objective within the Strategy, little is written about the ambition for delivering this. Welsh Government writes "*we want to encourage RMAs to have conversations with communities around their own management of risk and help them to become more resilient to the impacts of flooding*", but measures for committing resources, or monitoring this, are noticeably absent.

The revised National FCERM Strategy also describes the need for community engagement for the development of adaptation plans (in addition to community flood plans). This is an important step-change since the first national strategy and demonstrates concern for longer-term resilience. However, it is important to be cognisant of the way in which community engagement is framed in terms of providing '*clear information and evidence'* to encourage residents and businesses to become involved in adaptation planning. Although awareness is a pre-requisite for action, there is a considerable body of research demonstrating the insufficiency of 'knowledge-deficit' based approaches to engagement (See for example, Simis et al., 2016; Anderson, 2015; Barr and Gigl, 2007). Arguably more innovative and meaningful engagement methods are required to not only engage, but also empower, local communities to become actively involved in adaptation planning.

The importance of this is emphasised in a recent evidence review (conducted under the R&D programme) into community engagement on climate adaptation (Kelly and Kelly, 2019). Based on analysis of 300 reports and publications, the review outlines several recommendations, such as the need to consider the influence of place attachment in decision-making, the importance using appropriate and sensitive language and adopting co-production approaches (as opposed to consultation). The latter calls for the inclusion of engagement practitioners, local communities, technical specialists and even artists to embrace participatory and creative methods to foster understanding (such as simulations, visualisations and storytelling). This research is still ongoing and will be piloting community engagement methods in several locations in England to help inform good practice guidance. While there are opportunities for learning across the border, equally there is a need to explore and tailor different engagement methods to suit the Welsh context and vibrancy of Welsh culture and the Welsh language. This will be particularly important in initiating so-called 'difficult conversations' with coastal communities (see Section 4.3.5). As highlighted by the *Wales Sustainable Communities Pilot* (NFF and CEP, 2018), this means that there needs to be a more fundamental shift away from project-based thinking and instead seeing engagement as part of an ongoing process.

> "you know this is where we come from, we had civil engineering *project*…But the reality is if are going to be going down the adapted pathways route we're going to need much more of the long term *ongoing* relationships with communities, we're going to ask them to continuously adapt and involve themselves" (NFF).

Key learning points:

Raising awareness of flood and erosion risks is a pre-requisite for action, but is not in itself enough to promote action. There is a recognised need to engage and empower local communities to become actively involved in FCERM and adaptation planning. However, traditional forms of consultation are insufficient.

There is a need to diversify the 'toolkit' and explore alternative and creative ways to engage communities in *meaningful* ways, appreciating that community engagement is an ongoing process.

4.9. Incident response and recovery

Resilience to flooding is partially secured through the ability to anticipate, respond and recover from the impacts of a flood event. The roles and responsibilities of Category 1 and 2 Responders (as listed in Table 4.3) are clearly established through the *Civil Contingencies Act 2004* and the *Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005*, and *The Fire and Rescue Services (Emergencies) (Wales) (Amendment) Order 2017*. These responsibilities are further clarified within the *Wales Flood Response Framework* (Welsh Government, 2016d).

Table 4.3: Summary of Category 1 and 2 Responders in Wales (from Welsh Government, 2016d)

Category 1 Responders	Category 2 Responders
Natural Resources Wales	Electricity distributors and transmitters
Local Authorities	Train Operating Companies
Police Forces and British Transport Police	Airport Operators
Fire Authorities	Harbour Authorities
Welsh Ambulance Service NHS Trust	Water and Sewerage Undertakers
Port Health Authorities	Network Rail
Health Boards	Gas distributors,
Public Health Wales	Telephone Service Providers
	Trunk Road Agent

Flood warnings are informed by the National Severe Weather Warning Service provided by the Met Office and the Flood Forecasting Centre, which was established in 2009 as a joint initiative between the Met Office, Environment Agency and NRW. Flood Guidance statements provide a five-day forecast flood risk issued on a daily basis to emergency responders, with a corresponding flood risk matrix to indicate the likelihood and potential impacts of flooding. A public, three-day flood guidance statement is available via NRW, who maintain the public flood warning service in Wales and the Flood Warnings Direct service. Improvements have also been made to the coverage and capability of rainfall and rive gauge network, and modelling capabilities, to improve NRW's capabilities for in-land flood forecasting (NRW, 2016d).

Emergency preparedness is facilitated through the Local Resilience Forums (LRF). There are four LRFs in Wales (Gwent, South Wales, Dyfed Powys and North Wales), who are comprised of both Category 1 and 2 Responders. The LRF is responsible for planning and preparing for risks identified in Community Risk Register and leading the formation of multi-agency emergency plans. Learning between LRFs is facilitated through Regional Flood Groups (South East Wales, South West Wales and North Wales), which provide a forum for sharing best practice and resources, as well as supporting dialogue with Welsh Government (Welsh Government, 2019a). This is further supported at the national scale through the Wales Flood Group, which identifies work required at a strategic level to enhance resilience across agencies and services in Wales.

Arrangements for emergency response adhere to the principle of subsidiarity, where decision-making is devolved to the lowest appropriate scale, with collaboration and coordination at the highest level necessary. This is illustrated in Figure 4.1. Triggers for escalating an emergency will determine whether a local or pan-Wales response is required (as outlined in Welsh Government, 2016d).

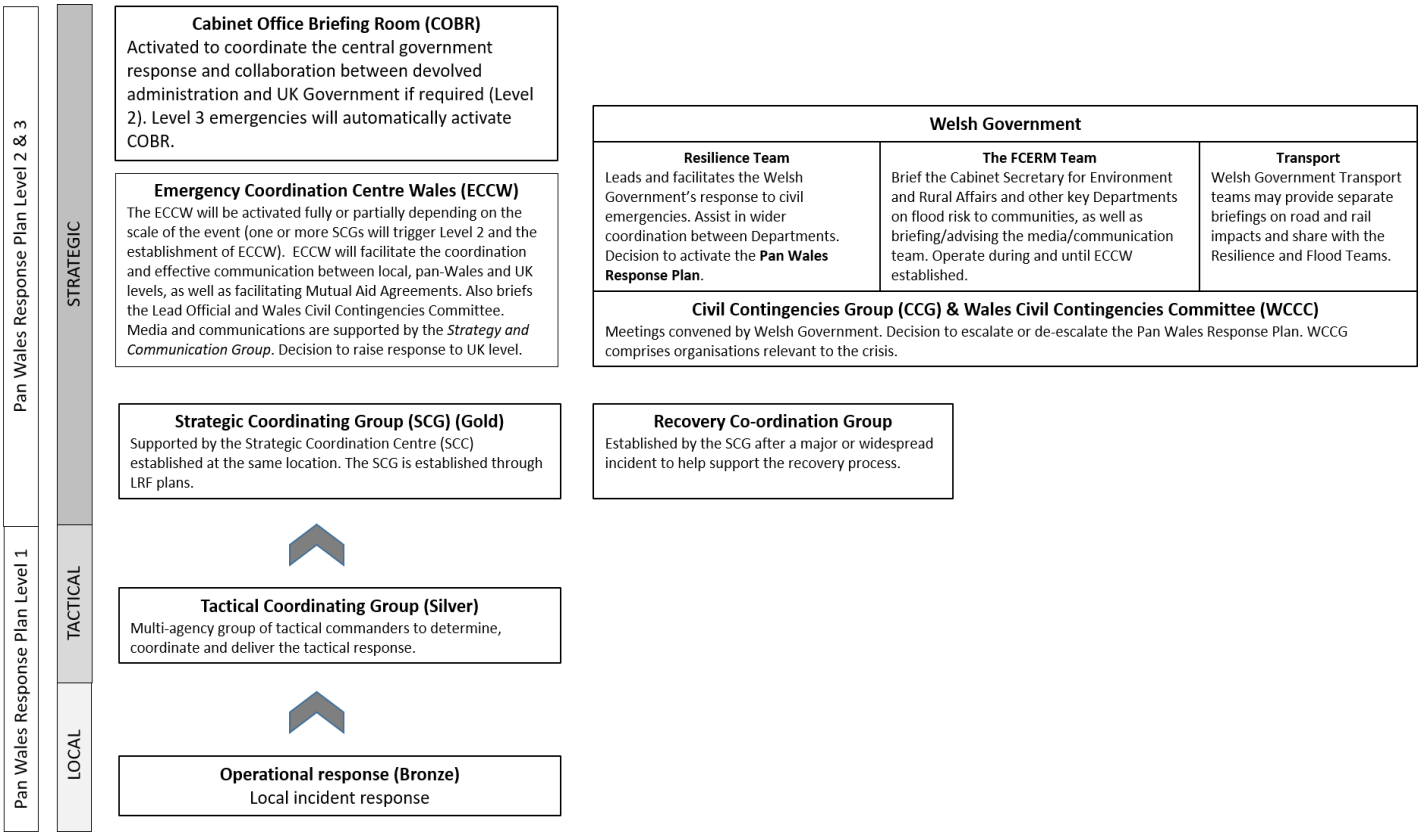

Figure 4.1: Emergency management arrangements in Wales

Debriefing and learning from flood incidents is an established practice, and LLFAs are legally obligated to investigate floods under Section 19[62] of the *Flood and Water Management Act 2010*. The Wales Flood Response Framework itself is also seen as a living document, subject to biennial review to enable revisions as required. Training and exercising emergency response arrangements is also key for examining the effectiveness of emergency response arrangements. Following the Winter 2013/14 coastal flooding, Exercise Megacyma in 2015 further tested the strategic response arrangements for widespread coastal flooding in South Wales (Exercise Megacyma, 2015). The institutionalised nature of learning within this aspect of FCERM governance is a notable strength.

In the immediate aftermath of a flood event, shelter and temporary housing will be coordinated through the local authority. Advice and support are also available through the nationally-registered charity, the National Flood Forum, who provide guidance around flood recovery, support for establishing community flood action groups, and advice for installing property-level measures (available through the NFF 'blue pages'). Floods also exert a significant impact on both physical and mental health, with formal guidance available through Public Health Wales (PHW, 2018). This is topic is discussed in Section 5.2.3 in relation to the well-being goal for 'a healthier Wales', and is therefore not repeated here.

Overall, we regard emergency management in Wales to be a considerable strength of the Welsh system, particularly in relation to the cohesiveness of the governance framework, clarity in roles and responsibilities and corresponding policy triggers. This further mirrors the emergency management arrangements in England, which have equally been commended and praised is relation to other EU countries (Alexander et al., 2016; Gilissen et al., 2019). A potential area of improvement pertains to the involvement of the voluntary sector in emergency recovery, which could play a valuable role in supporting the health and well-being of flood-affected communities; this is discussed further in Section 5.2.3.

4.10. Flood insurance

Private market insurance has a high penetration, with flood insurance typically embedded within composite policies for buildings insurance. In addition, a Government-back, not-for-profit, Flood Reinsurance scheme ("Flood Re") has been established under Part 4 of the *Water Act 2014* for England and Wales since 2016. This represents a twenty-five-year agreement between the UK Government and insurance industry to ensure access to affordable home insurance in high-risk areas. The scheme essentially functions as a pool-backed system,

[62] No formal threshold is established for Section 19 reporting; however, Welsh Government has outlined its expectation that this should be completed when at least 20 or more properties have suffered internal flooding.

whereby the premiums of properties at high risk are capped and subsidised by a levy payable by insurers. This levy raises £180m annually through a cross-subsidy on buildings and home insurance policies. Additional funding for Flood Re is provided through the fixed premium (based on council tax bands) and a fixed excess on each policy, both charged to the insurer (as opposed to individual policy holders). The scheme is applicable to residential properties only and properties built before 2009; thus, providing a further mechanism to deter development from at-risk areas, in tangent with other spatial planning mechanisms (as discussed in Section 4.5).

Flood Re is intended to provide a stop-gap to enable the market to transition to risk-reflective pricing by 2039. A transition plan must be produced at least every 5 years to monitor progress; the second of which was published in 2018 (Flood Re, 2018). According to the latest update, Flood Re is now offered through 90% of the home insurance market, benefitting nearly 250,000 properties across the UK (Flood Re, 2018; 2019). In turn, households have reported having access to more choice as well as seeing price reductions.

Although the scheme only indemnifies insurers for the cost of like for like repairs, the transition plan outlines a vision to '*build back better'* through the use of household and community resilient and resistant measures, increasing awareness of flood risk and appropriate actions for mitigating these risks. However, it is not yet clear how the scheme itself might incentivise property owners to take action to reduce their risk. Research was commissioned by Flood Re in 2018 to examine these issues further and identify potential incentive mechanisms for promoting the uptake of property-level measures (see Oakley, 2018). This included options for i) rewarding action through reduced premiums; ii) a 'three strikes and you're out' (or variations thereof) approach whereby policyholders are either barred from the scheme if they fail to adopt property-level measures, or face rising excess costs; and iii) the use of a Flood Performance Certificate (akin to Energy Performance Certificates) via a flood resilience survey. However, there are a number of limitations to each of these; for example, higher premiums have historically done very little to incentivise the uptake of property-level measures. Therefore, Oakley (2018) concludes that hard incentives within Flood Re are unlikely to drive significant change in householders' behaviours. Instead, a package of initiatives are likely to be required to increase awareness of both the risk and available property-level measures (and benefits of these), and crucially how these might be funded (e.g. through a national grant scheme or private contributions). Further research is warranted to examine these issues further.

Although the direct role of Flood Re may be limited (Oakley, 2018), the transition plan outlines the ways in which Flood Re intends to act directly or in a supportive capacity (Table 4.4). For instance, the scheme will support ongoing endeavours to promote standards for property level resilience (Defra, 2016), while directly enabling community flood resistance and resilience measures. Before the next transition plan (due 2023) Flood Re intends to – i) clarify its role in relation to the supportive tasks outlined below; ii) examine ways in which it can incentivise

'*building back better*', including testing householders' understanding of property-level resilience measures and how this might be improved (e.g. through effective communication or establishment of flood performance certificates); and iii) undertake projects to support social capital building.

Table 4.4: Flood Re roles relating to its 2039 vision (adapted from Flood Re, 2018)

Flood Re will play a supportive role in relation to …	Flood Re will play an active role in relation to…
- Those with unavoidably high levels of flood risk; - Minimising the size of the highest risk group; - Improving consumer information on flooding and the value of insurance; - Increasing the overall flood resilience and resistance of the UK's housing stock; - Reducing the cost of reinstatement; - Improving property flood resilience and resistance products; - Investing in flood risk management and defences; - Development with flood risk in mind.	- Enabling community flood resistance and resilience; - Improving flood modelling; - A smooth Flood Re exit; - Active engagement in the market.

However, there is a risk that the certainty provided by the scheme until 2039 might reduce the sense of urgency required, and even dis-incentivise risk mitigation in the interim. Others have also expressed concern about the seeming invisibility of Flood Re to policyholders and importance of transparency (Surminski, 2016). Combatting these concerns, and **promoting the uptake of property level resistance and resilience measures, will require collaborative efforts across Government, RMAs, Flood Re and multi- and inter-disciplinary research teams to examine potential governance mechanisms for leveraging, and crucially supporting, behavioural change.**

4.11. Marine management and FCERM

4.11.1. Marine management in Wales - Overview

When compared to terrestrial spatial planning, marine spatial planning is relatively young, although has gained momentum over the past 10 years. Marine spatial planning provides a framework for supporting the sustainable management of marine and coastal resources and reconciling a range of competing economic demands placed on the marine environment, with the preservation of marine and coastal ecosystems.

The *Marine Strategy Framework Directive 2008* (Directive 2008/56/EC) enshrines an ecosystem approach and requires Member States to achieve a Good Environmental Status of EU marine waters by 2020, to reverse declines in biodiversity and ensure the protection of marine species and habitats. To achieve this, Member States are required to develop a Marine Strategy for marine waters, to be reviewed every 6 years. This was transposed in the UK through the *Marine and Coastal Access Act 2009* (hereafter The Marine Act). The Marine Act provides a framework for establishing marine conservation zones, and for developing marine

planning in the inshore area (high water spring tide mark out to 12 nautical miles) and the offshore area (12 to 200 nautical miles, or the median line with other countries).

Building on the requirements of the *Marine Strategy Framework Directive 2008*, the *Maritime Spatial Planning Directive 2014* (Directive 2014/89/EU) (hereafter the Maritime Directive) addressed the need for transparent planning-at-sea systems, and cross-border cooperation to directly support the sustainable growth of maritime economies and sustainable development of marine areas. The Maritime Directive requires Member States to develop and implement maritime plans by 31st March 2021 (to be reviewed every 10 years). Due to the efforts already underway in the UK, this was also transposed in the UK through the Marine Act 2009 and addressed through the UK Marine Policy Statement and high-level marine objectives[63] (HM Government, 2011). In consistency with the Marine Policy Statement, each devolved administration is responsible for developing Marine Plans for designated marine planning regions; in Wales, this is led by Welsh Government with support from NRW.

The first **Welsh National Marine Plan** (hereafter WNMP) was published on the 12th November 2019 (Welsh Government, 2019m); as this was outside the scope of this research, the following analysis and findings pertain to the original consultation document (Welsh Government, 2017h), and interviews with key stakeholders. The WNMP aims to provide a strategic national framework for sustainable development and management of Welsh seas and marine resources over a 20-year planning horizon. This is intended to provide support and improved understanding of the current network of Marine Protected Areas (MPAs) and establish guidance to support business investment and blue growth. The WNMP will also adhere to the requirements set out by the *Environment (Wales) Act 2016* and the *Well-being of Future Generations (Wales) Act 2015*. This is summarised in Figure 4.2. Finally, to support the WNMP, a review of existing evidence was produced through the Wales Marine Evidence Report (Welsh Government, 2015b), while the Marine Planning Evidence Portal is a platform for spatial evidence within the marine planning area in Wales.

[63] The High-Level Marine Objectives include – i) achieving a sustainable marine economy; ii) ensuring a strong, healthy and just society; iii) living within environmental limits; iv) promoting good governance; and v) using sound science responsibly.

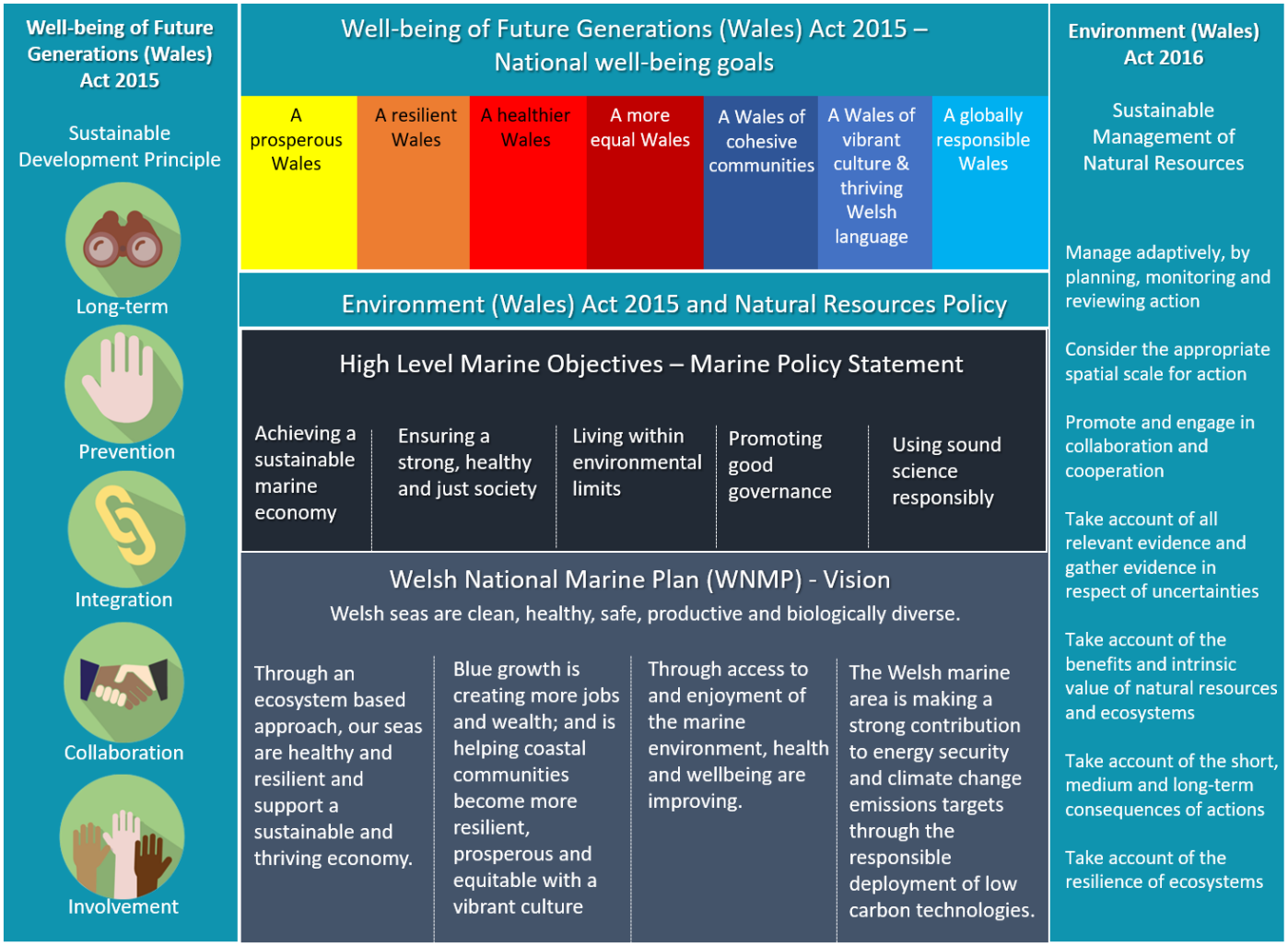

Figure 4.2: Marine Planning context in Wales (adapted from Welsh Government, 2017h)

4.11.2. The relationship between Marine Management and FCERM

The coastal zone is covered by a host of intersecting and overlapping legislation (Figure 4.3). The inshore area for marine spatial planning spans from the High Water Spring Tide mark to the 12 nautical miles limit of territorial waters; therefore, certain activities or developments (including, for example, flood defence assets) may require a marine license via NRW's Permitting Service. In Wales, marine licensing (for both inshore and offshore regions) is granted by NRW.

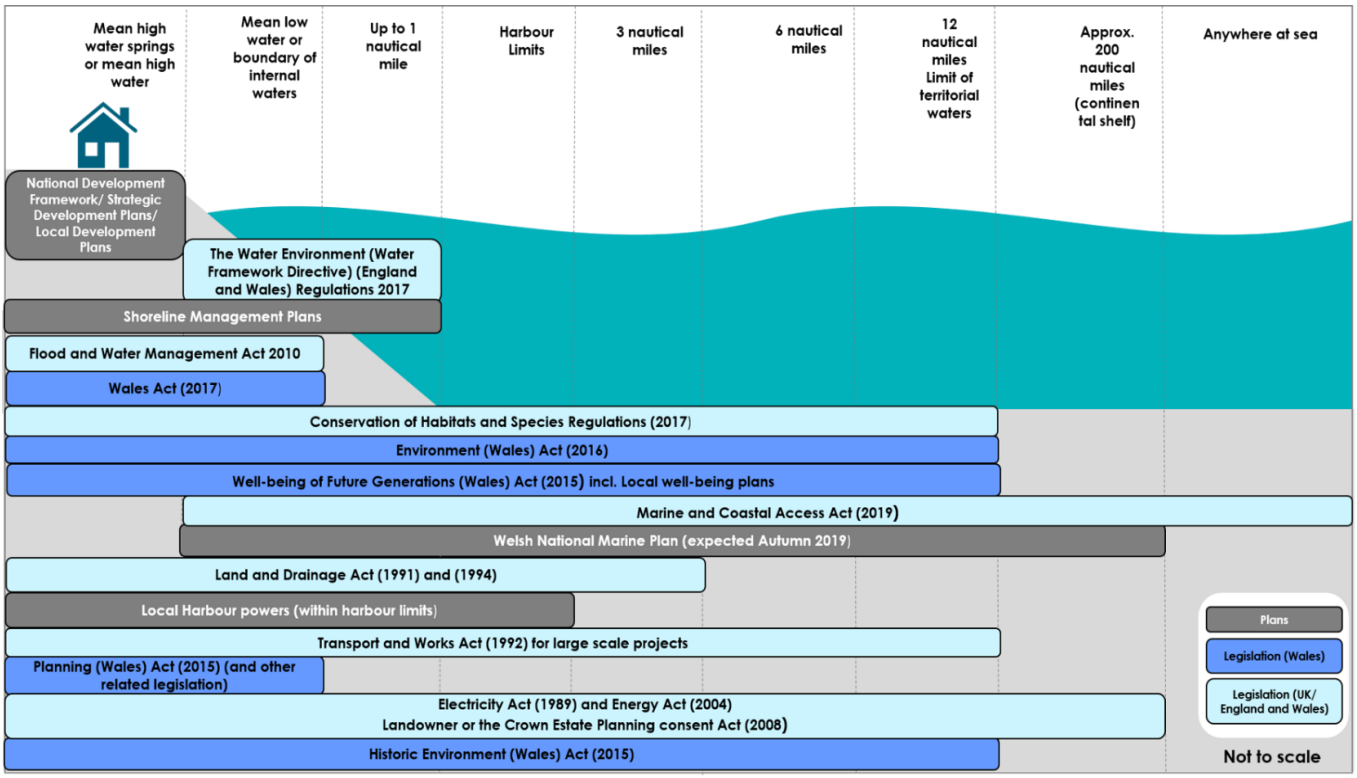

Figure 4.3: An overview of legislation within the coastal zone in Wales

Management across the coastal zone is complex, and there has been a historical disconnect between FCERM and marine management, despite considerable efforts to engage with relevant planning and management bodies in the past (e.g. Welsh Assembly Government, 2011), as well as a suite of related activities through previous forums, such as the Wales Coastal and Maritime Partnership. However, with the production of the WNMP, there is an opportunity for improved consideration of relevant policy areas. Interviewees commented on the inclusion of policies which specifically relate to coastal adaptation and resilience, including explicit mention of the Shoreline Management Plans in the WNMP. The draft WNMP included policies which cover resilience to coastal change and flooding and state, for example, that "*proposals should demonstrate how they are resilient to coastal change and flooding over their lifetime*". Additionally, the implementation guidance included in the draft WNMP[64] stated that plan-users should take account of Welsh Government's flood risk policy, Planning Policy Wales and refer to TAN 15 (see Section 4.5). It is further stated that users should "*take into consideration policies within SMPs*" to provide context for decision making. However, it is noteworthy that the revised National FCERM Strategy makes no such direct reference to the WNMP, giving an arguably softer statement – "*The Welsh Government's preference is for the SMP position for each section of the coast to be supported in Strategic and Local Development*

[64] Note that this will be separated in the final WNMP when adopted.

Plans and Strategies relating to infrastructure or activity on the coast such as marine planning, agriculture or housing" (Welsh Government, 2019a: 51). This speaks to the need for improved awareness and coordination between the two policy areas (discussed further below). Given the dynamic nature of coastal flooding, and the complexities of managing the land-sea interface of coastal space, more explicit integration between marine management and FCERM in Wales is required. For this to be achieved, FCERM should be more strategic and make direct references to the marine plan and relevant policies.

While the newness of the WNMP could be seen as a weakness, it was also stressed that this has meant that "*the marine plan has the opportunity to include and the draft has included policies on things like more forward thinking about well-being or additional bolstering for the shoreline management plans but it may not have been able to do quite a few years ago*" (NRW), creating opportunities for those working in different policy areas to develop common "tool-kits".

> "… there's a whole section on coastal change and flooding in the marine plan and there's a whole load of implementation guidance that really emphasises the need to…manage the coast sustainably. We've got a policy on resilience to coastal change and flooding, so…we should demonstrate how [proposals] are resilient to coastal change and flooding and then…how they avoid significant adverse impacts upon coastal processes and minimise the risk of coastal change and flooding. Proposals that align with the relevant Shoreline Management Plans and its policies are encouraged" (NRW)

> "I think the big opportunity is that it does bind, it does have a legal requirement to developments that are not just solely in marine and are not solely in re-licensing it does also impact any public authority making a decision that could affect the marine area which I think is a real opportunity to try and encourage them to join up". (NRW)

It was suggested that "*the jigsaw doesn't always fit together particularly well*" (NRW) in relation to different regulators' duties (e.g. NRW licensing duties and LA may have different priorities) and policy areas, but some interviewees felt that the WNMP could go some way to bridging that gap. Despite a positive view being taken on the inclusion of the SMPs, there is some confusion as to what the reality of this inclusion in the WNMP will mean in practice.

4.11.3. Stakeholder awareness of the WNMP

While there was general acceptance from interviewees that the WNMP has attempted to include references to FCERM, there was a feeling that this has been at a policy level only, and there has not yet been a phase of implementation to evidence whether this attempt at integration has been successful in practice (see quote below). There were concerns that awareness of the WNMP and its links to FCERM remain low among some stakeholders and/ or WNMP plan users, which could lead to weak integration across the two policy areas. One interviewee stressed that the WNMP should be more than a framework that gets adopted on

paper and then largely ignored in practice, and that efforts should be made to effect real change in terms of delivering more joined-up thinking between these two policy areas.

> "…the policy is there but the practice isn't yet. I think the big challenge now is making sure we don't end up thinking, what a great policy we've got but actually it's not doing diddly squat when it comes to being on the ground because nobody is really aware of it, people are making decisions as they always have done and …they're not looking for the marine plan and they're blissfully ignoring the SMP2. So, there's still a lot more to do. I think the plan is a brilliant framework but it needs to not just be a framework that gets adopted and then people just keep going as they always did. I feel there's a risk that could happen. But it's a risk that we were aware of and Welsh Government are aware of and are working to try and make sure that planning evolves and improves and a lot of that will be about engaging across the land/sea…cross border is one thing but the land/sea interface across the whole of Wales is really important and marine planning could do a lot there" (NRW)

All interviewees emphasised the importance of engaging *all* Local Authorities with marine planning (including non-coastal LAs) and the need to ensure clear coordination and integration between marine and terrestrial planning. There is a clear ambition to align marine management and the WNMP with integrated coastal management – the explicit reference to the SMPs and coastal adaptation highlights this thinking. Interviewees expressed concerns about the lack of connection between non-coastal LAs with the WNMP process – it was suggested that this could be a potential issue for integration across policy areas, given that "*there are decisions taken upstream which can be linked to the WNMP and a need to take account of marine planning*" (NCC). In addition, the WNMP represents a shift from the norm for many LAs (i.e. marine planning will not have been part of their everyday thinking before), and it will take time for the inclusion of WNMP within planning decisions to become business-as-usual. Furthermore, one interviewee commented that it may be difficult for LAs to prioritise marine planning over and above other regional or local needs (see quote below).

> "[If you] speak to the local authorities…they're just like [this is] not business as usual, [they need to]…only work on absolute priorities. So, you know, for a local authority…they're just thinking…we need to keep the schools open and toilets open and [not about the marine plan]" (Coastal Partnership)

In addition, there is a need to recognise the tidal characteristics of many areas of Wales (e.g. the tidal Usk), which may come under FCERM planning or policies. The level of stakeholder engagement and the processes undertaken to support this during the development of the WNMP are a strength of the overall process; despite there being concerns about how this can be sustained once the WNMP is adopted. Welsh Government stressed their desire to continue the level of stakeholder engagement that has underpinned development of the WNMP, and will use the recently formed Marine Planning Decision Makers Group (a mixed group of stakeholders, including non-coastal local authorities and those less familiar with marine planning) to identify demand for supplementary guidance and training, regarding interpretation and implementation of the WNMP and its policies across Wales.

4.11.4. Managing the coastal zone

The need for coordination between the WNMP and other relevant areas of policy, including coastal adaptation and wider FCERM, is explicitly set out in the most recent NDF consultation draft. Moreover, it is noted that all 6 terrestrial Area Statements currently being developed by NRW have a coastal boundary – these will be complemented by the Marine Area Statement, with the boundaries between Area Statement areas considered to 'fuzzy' to facilitate integration and joined up thinking across topics, sectors and policy areas. The importance of coordination and effective communication across the area statements and their implementation teams was stressed by one interviewee, who indicated concerns that there may be an incorrect assumption that all things coastal will be addressed in the marine area statement (see quote below).

> "[We are] trying to talk to all the people that are working on the terrestrial area statement to say, now don't forget coast and don't assume things are being done in the marine one. And, you know, these are some of the pressures and issues…make sure that they're being considered in both [the marine and terrestrial area statements] because the delivery of coastal adaptation…will affect land and bring benefits for the sea…." (NRW)

This move towards improved integration across land and sea was recognised through the interviews, where there was general consensus among interviewees that developing the first national Marine Plan posed both a challenge and opportunity for management of the coastal zone. Interviewees recognised that marine planning is "*lagging behind the terrestrial plans",* meaning there will be weaknesses and areas of the WNMP that require improvement during the review cycle, including areas linking to local and regional coastal adaptation and FCERM strategies more broadly. Due to the national scale of the WNMP, the Welsh marine planning process is not currently at a place where it can clearly influence positioning of new developments (e.g. coastal defence assets), to some extent weakening its overlap with FCERM and other related policy areas. As explained above, there was a feeling that, overall awareness of the WNMP is quite low among those not directly affected by it, which may influence the level of consideration that those working in FCERM give to the WNMP.

> "The other weakness I see at the moment is that it isn't yet adopted or published. Awareness of it is really quite low at the moment, I would say amongst decision makers and particularly with the more terrestrial local authority decision makers that will have to make decisions in accordance with the plan, but they might not be as aware of what that actually means in practice." (CEFAS)

Collaboration and effective stakeholder engagement were considered to be crucial to the delivery and implementation of marine planning and marine and coastal management more broadly. Many interviewees commended the excellent stakeholder engagement from Welsh Government in terms of the development of the WNMP and expressed that this has "*brought stakeholders together and will continue to do so in the future*" (NRW). In particular, the use of the Stakeholder Reference Group has been very effective both to contribute to the consultation

phase, but also to unpick some of the issues that came out of the consultation. There was, however, some concern that there had been some disconnect between the marine planning process and terrestrial planners, and other relevant policy areas. However, Welsh Government have called for the formation of the Marine Planning Decision Makers Group, which includes terrestrial planners, and may therefore provide a stronger link to FCERM. This has been seen as a positive move to support implementation of the WNMP and facilitating integration across relevant policy areas, including FCERM and well-being.

There was a feeling from interviewees that the draft WNMP exhibited a lack of experience in planning policy, with a lack of clarity on the wording on the WNMP policies. For example, there was some concern about the language around 'well-being of coastal communities' policy within the WNMP, with expressions of uncertainty around what this actually means from interviewees and how the policy can be monitored and implemented. One interviewee commented that it may have been a 'knee-jerk' response to *Well-being of Future Generations (Wales) Act 2015*, questioning the need for a specific policy for 'well-being' over and above the other policies that speak to addressing the well-being goals (e.g. Welsh language, climate change and resilience). However, there is a recognition that the review process built into the WNMP implementation will provide an opportunity for these issues to be addressed in the future.

4.11.5. Integration and coordination across policy areas

While the desire for better integration and more joined up thinking across WNMP and relevant policy areas, such as well-being and FCERM, is evident, there are concerns regarding the availability of ongoing funding and resource to support continued of stakeholder engagement following adoption of the WNMP. Furthermore, LAs and other planning authorities are already working in a resource constrained environment, which limits their capacity to be involved in areas outside their normal working remit – "*I think also ultimately with LA's, they're, just like we are, very resource stretched…[and] a sort of resulting symptom of that is a lack of capacity to do anything other than what they absolutely have to do"* (NRW). Resource constraints reducing stakeholders' capacity to work in an effective integrated manner, was highlighted as a challenge by other interviewees, who felt that limited resources (in terms of funding, but also staff time and effort) mean that sometimes trade-offs are required to achieve a balance (see quote below)

> "There's a bit of a balance to be struck there isn't there? Being on all of those groups you just can't make it all of the time and we don't…have a policy officer to service all of these, and local government, NRW, the local authority etc. No one has got any money, no one has got any resource, you know, so it's a challenge" (Coastal Partnership)

The formation of the Marine Planning Decision Makers Group may address some of these concerns (e.g. acting as a voice for different users and stakeholders); however, there was a call for sustained and committed funding from Welsh Government to ensure meaningful engagement with stakeholders throughout the WNMP review cycle.

Key learning points:

It is vital that efforts to join up thinking across the land-sea interface continue – the review process and the Marine Planning Decision Makers Group should be used to support this joined-up thinking to address common challenges.

There is a need to enhance the connectivity between those involved in marine and terrestrial planning and those involved in Local Authorities.

While there are efforts to better integrate FCERM and marine management through the WNMP, there are opportunities for strengthening the legal imperative for improved coordination and integration between these two policy arenas.

There is a need to address the resource and funding gap to support coordination and joined up thinking across marine and terrestrial planning.

4.12. Summary of strengths & weaknesses in FCERM governance

Section 4 has outlined a range of strengths, weaknesses, opportunities and challenges to effective FCERM governance in Wales – these are summarised in Table 4.5.

Table 4.5: Summary of strengths & weaknesses within FCERM governance

Theme	Strengths	Weaknesses
Strategic direction	▪ Holistic risk-based approach is reinforced in national policy and is key for societal resilience; ▪ Diversified approach to FCERM emphasised, with continued movement away from defence-dominance towards Natural Flood Management and hybrid approaches; ▪ Ethos of working with natural processes supports ecosystem resilience; ▪ Discursive strength and desire to do things differently, with growing expectations towards multi-beneficial initiatives; ▪ Stronger emphasis on minimising exposure through spatial planning;	▪ Adaptation not fully embedded in risk paradigm and absent from the strategic objectives outlined in the revised National FCERM Strategy; ▪ Lack of assertiveness in language; ▪ Whilst pragmatic, the Strategy lacks long-term ambition, with many measures focused on 2021/22; ▪ Continued commitment to investigating options, as opposed to implementation *per se*; ▪ Lacking a sense of urgency when it comes to coastal adaptation; ▪ Absence of explicit well-being objectives and limited perspective on well-being goals and exclusion of 'culture and language' (discussed further in Section 5).
Funding arrangements	▪ Medium-term capital commitments in the FCERM programme and CRMP to support longer-term planning and efficiency savings; ▪ Stable capital funding; ▪ Requirement for contributions to be secured at the local scale could enable more schemes to be funded;	▪ Funding is primarily allocated according to the protection of people and property, which reinforces defence-based approaches and is ill-suited to adaptation schemes, leaving an 'adaptation gap' in funding; ▪ Budget silos make it difficult to access funding for adaptation-based schemes;

Theme	Strengths	Weaknesses
	▪ Risk-based funding allocation and dominant weighting towards the Communities at Risk Register, seen as a fairer approach; ▪ Funding formula does not penalise schemes where partnership contributions are severely limited; ▪ Multi-beneficial schemes encouraged, linking to well-being goals; ▪ NFM must be short-listed (business case guidance); ▪ Small scale Works Grant provides easier access to funding for maintenance and NFM approaches;	▪ CRMP criticised for favouring defence-based engineering schemes, as opposed to adaptation initiatives, linked to nature of funding criteria and length of the programme; ▪ 'Wider benefits' and well-being contributions are least-weighted in scoring criteria for funding. Moreover, whilst qualitative descriptions are welcomed, quantification of wider benefits is preferable yet many of these remain intangible; ▪ Shortfall in revenue funding, yet this is essential for a wider range of activities. Calls for longer-term commitment from government; ▪ CRMP is available to LLFAs, only; ▪ Calls to re-frame FCERM in the context of climate change adaptation, to recognise it as part a wider socio-economic problem; ▪ Mechanisms for incentivising contributions from other actors, particularly private sector, are lacking; ▪ Access to funding contributions from Network Rail constrained by their remit to maintain (not enhance) rail infrastructure and 5-yearly control periods.
Coastal adaptation	▪ Long-term planning policies outlined through SMP2s; ▪ Coastal Groups play a key role in coastal governance and provide valuable forum for sharing knowledge across otherwise disparate groups of stakeholders. The WCGF is an essential bridging mechanism for linking sub-national Coastal Groups with Welsh Government; ▪ Representation of WCGF on FCE Committee ensures coastal matters are considered in wider FCERM; ▪ New requirement for Coastal Groups to give annual reports on SMP2 action plans; ▪ Newly established Wales Coastal Monitoring Centre (funded until 2022) to provide a strategic, coordinated approach to coastal monitoring; ▪ Examples of frameworks for navigating adaptation *processes* (e.g. Fairbourne and Newgale), which actively involve communities and adopt long planning horizons;	▪ Governance mechanisms/policy instruments for enabling adaptation are currently absent; ▪ "Adaptation gap" in funding outlined above; ▪ SMP2 are unfunded proposals, only. Hold the Line policies will require capital and revenue funding to maintain existing line of defence, while Managed Realignment and No Active Intervention policies will require funding for adaptation; ▪ Resource constraints limit activities of Coastal Groups and meeting attendance; ▪ Recognised need to diversify stakeholder representation within Coastal Groups; ▪ Lack of awareness of SMP2 amongst professional and public stakeholders; ▪ Calls for stronger leadership from Welsh Government to support Coastal Groups and locally-based adaptation. Ongoing calls for a strategic framework *through* which to deliver adaptation on the ground; ▪ Need to shift mentality from project-led 'predict and provide' approaches, to recognise adaptation as an ongoing *process*; ▪ Non-statutory status of SMP2 comes into conflict with Highways legislation and duties to maintain Public Rights of Way; ▪ Slow implementation of SMP2; ▪ Ongoing delays in the delivery of the Coastal Adaptation Toolkit/guidance, alongside concerns that it might be too prescriptive or lack utility; ▪ Challenges implementing Managed Realignment related to navigating multiple land and asset owners, with different remits, priorities and planning cycles; ▪ No long-term commitment to the Wales Coastal Monitoring Centre; ▪ Traditional forms of public consultation are insufficient. Need for proactive and meaningful engagement, with range of techniques, to empower local communities to be actively involved in shaping

Theme	Strengths	Weaknesses
		their future. Resources and future research required; ▪ Feeling amongst practitioners that there is not currently a united approach to coastal adaptation or sense of urgency at a political level.
Ecosystem resilience	▪ *Environment (Wales) Act 2016* mandates the Sustainable Management of Natural Resources (SMNR) and places a biodiversity and resilience of ecosystems duty on public bodies; ▪ Policy coherence between FCERM and Natural Resources Policy, means schemes with flood-related benefits could be delivered through additional sources of funding external to the FCERM programme. Delivery of nature-based approaches is a shared priority; ▪ Area statements will provide a valuable local evidence-base as well as a key governance mechanism to facilitate SMNR and identification of opportunities for collaborative working, with the view of delivering multi-beneficial schemes; ▪ Powers to experiment allow for new area-based approaches to be developed; ▪ National Habitat Creation Programme provides compensatory habitats for FCERM schemes to offset coastal squeeze losses; ▪ NFM and hybrid schemes are eligible for FCERM grant funding as long as the primary scheme objective is to reduce flood risk to properties. ▪ Duties for collaboration and assistance between NRW and public authorities established in the *Environment (Wales) Act 2016;* ▪ Synergy between FCERM policy and National Trust ('Shifting Shores' policy) facilitates joint-working;	▪ Weak wording observed in the *Environment (Wales) Act 2016*, whereby public authorities must have 'regard to' area statements, only. NRW are required to 'encourage' others to take steps to implement Area Statements; ▪ Establishing confidence in new approaches requires 3-5 years of evidence and ongoing monitoring to establish their effectiveness at mitigating flood risk, yet resource constraints could restrict monitoring; ▪ Evidence gaps remain in terms of quantifying the benefits of catchment/area-based approaches, particularly NFM and other intangible benefits for well-being; ▪ Restrictions to National Habitats Creation Programme e.g. historical flood defences and third-party assets excluded, although exception clauses are in place. Means full-effects of coastal squeeze are difficult to assess; ▪ Slow delivery of NHCP due to i) challenges of negotiating across multiple land/asset owners; ii) misaligned planning cycles; iii) duties of care and difficulties changing Public Rights of Way; ▪ Considerably expensive to realign and decommission existing assets to form compensatory habitats;
Spatial planning and FCERM	▪ Specific guidance on *Development and Flood Risk* (Technical Advice Note, TAN 15) to inform development planning and decisions on planning applications; ▪ Precautionary approach to steer development away from at-risk areas established, according to flood zone and vulnerability of development; ▪ Flood Consequence Assessments required for flood zone C, alongside Justification and Acceptability tests; ▪ Successful applications contingent on the ability of the developer to reduce the consequences to an acceptable level; ▪ Planning authorities must have 'regard to' to the Local Well-being Plans produced by the Public Service Board when developing SDPs and LDPs; ▪ Safeguards in place to minimise inappropriate development, including call-in powers and Notification Directions;	▪ LPAs are not formerly required to adhere to NRW advice; ▪ Current TAN 15 predominantly addresses fluvial and coastal risks; ▪ Criticisms of Development Advice Maps – excludes surface water and climate change allowances. Also uses different flood zones and thresholds to NRW's Flood Map; ▪ Criticism of artificial distinction between C1/C2 flood zones, and neglect of residual risks in C1; ▪ Lack of assertiveness towards development in flood risk areas and documented rise in number of planning permissions granted in Zone C (although inconsistency in LPA reporting is an issue); ▪ TAN 15 disjointed from TAN 14 (*Coastal Planning*) and TAN 14 considerably outdated; ▪ Stance towards other relevant planning documents (well-being plans, SMP2s) and climate change risk assessment could be strengthened to ensure full consideration;

Theme	Strengths	Weaknesses
	▪ LPAs must 'take account of' SMPs and are strongly discouraged from allowing further development in low-lying areas where the preferred option is towards managed realignment or no active intervention; ▪ Planning authorities and developers are required to take account of the potential impact of climate change over the lifetime of development (CL-03-16 guidance); ▪ There is an expectation that the WNMP and development plans should complement one another and facilitate integrated coastal zone management; ▪ Concept of 'Placemaking' is central tenet of Planning Policy Wales, emphasising importance of *inclusivity* in the creation of sustainable places. Significant improvements proposed through revised TAN 15 (currently under consultation), which address many of the weaknesses outlined. ▪ Merger of TAN 14 and 15; ▪ DAM to be replaced with NRW Wales Flood Map; ▪ Extended advice of flood resilient development; ▪ Stronger emphasis on Strategic Flood Consequence Assessments to inform Development Plans.	▪ Some gaps and potential missed opportunities in the revised TAN 15 related to the Strategic Flood Risk Assessment and engagement with Coastal Groups, as well as consultation with the Welsh National Marine Place to further reinforce/support joined-up thinking across the land-sea interface.
Surface water management	▪ Clearer responsibilities for surface water management with the enactment of the *Flood and Water Management Act 2010*; ▪ Inclusion of surface water risks within Wales Flood Map and Communities at Risk Register, alongside fluvial and coastal risks; ▪ Enhancement of Green Infrastructure and use of SuDS promoted in *Planning Policy Wales*; ▪ Implementation of SuDS Approval Bodies (SABs) in January 2019, requiring SuDS applications for new developments and compliance with statutory standards; ▪ Statutory consultees to support SABs decision-making; ▪ Adoption and management arrangement for SuDS must be agreed before construction; ▪ Step change in water sector to better address surface water risks and forthcoming Drainage and Wastewater Management Plans to promote an integrated approach; ▪ Regulatory incentives in place to encourage consideration of SMNR and long-term planning in Welsh water companies; ▪ Long-term planning horizon outlined in *Welsh Water 2050* to inform 5-yearly AMP business planning; ▪ Progress towards "rainscaping" urban centres and implementation of SuDS;	▪ Too early to establish effectiveness of SABs in practice; ▪ Potential difficulties in establishing an institutional cultural shift in the water industry and embedding long-term planning within 5-yearly Asset Management Periods; ▪ While Welsh Water (DCWW) is in a unique position as a not-for-profit organisation, other Welsh water companies are subject to shareholders and customer satisfaction is key; attitudes towards alternative approaches to grey infrastructure and willingness to pay could potentially undermine delivery of nature-based approaches.

Theme	Strengths	Weaknesses
Land use management and agriculture	▪ Previous agri-environment schemes have been effective in terms of halting and (to a limited extent) reversing declines in biodiversity; ▪ Proposed Sustainable Farming Scheme to reward environmental outcomes, including flood risk mitigation benefits; ▪ By offering conditional payments subject to actions, the Sustainable Farming Scheme has the potential to better incentivise a wider range of activities than the universal income support currently offered through the Basic Payment Scheme of CAP; ▪ High level of stakeholder input to inform recent consultations;	▪ Mixed success of agri-environment schemes in the past (e.g. Glastir Advance); ▪ Loss of CAP and stable income for farmers is a concern; ▪ Concerns surrounding the practicalities of implementing the proposed Sustainable Farming Scheme; ▪ Brexit uncertainty and continued delays with the Agriculture Bill through UK Government means high level of uncertainty at this point in time;
Community preparedness and incident response	▪ Flood Awareness Wales has been a central pathway for enhancing awareness; ▪ Increased coverage of flood warnings and automated services; ▪ Community flood planning is strongly advocated and supported; ▪ Efforts to improve consistency and access to flood information; ▪ *Wales Flood Response Framework* offers clarity on roles; ▪ Effective arrangements for activating and scaling response according to principle of subsidiarity; ▪ Institutional culture and practice of debriefing and learning from flood incidents, as well as training and exercising response arrangements (including Section 19 flood investigation reports under the *Flood and Water Management Act 2010*); ▪ Key forums/groups to facilitate the exchange of knowledge and best practice between category 1 and 2 responders across local, regional to national scales. ▪ Advice and support for local communities available from the National Flood Forum; ▪ Formal health advice and guidance for both the public and emergency responders is available through Public Health Wales;	▪ Resource constraints are a concern for sustaining community engagement; ▪ Criticism that community engagement focuses too heavily on outputs (i.e. community flood plans), as opposed to recognising the importance of the process itself; ▪ Engaging and empowering communities on matters of coastal adaptation require alternative ways of working – building relationships and capacity within communities to act is key. ▪ Calls for alternative forms of community engagement (not consultation); ▪ Scope for increasing involvement of the voluntary sector within emergency response/recovery arrangements and attendance to LRFs, with a particular focus on how voluntary groups could provide immediate and ongoing support for flood-affected communities to alleviate health impacts;
Flood Insurance	▪ Flood Re ensures access to affordable insurance; ▪ Post-2009 properties are exempt from the scheme, providing an additional incentive for development away from flood-prone areas; ▪ The move towards risk-reflective pricing in 2039 is prompting research into mechanisms for encouraging behavioural change and the uptake of property-level resistance and resilience measures; ▪ Flood Re's Transition Plan outlines a vision to 'build back better', including supporting research into standards for property-level measures;	▪ It is too soon to evaluate how Flood Re will support a just transition to risk-reflective pricing; ▪ Research suggests that hard incentives within Flood Re are unlikely to drive significant change in householders' behaviours; ▪ The Scheme is invisible to policyholders; ▪ There is a risk that Flood Re is seen as the panacea, or may even undermine the sense of urgency required to ready communities for risk-reflexive pricing.

Theme	Strengths	Weaknesses
Marine management and FCERM	▪ The WNMP includes a number of policies which specifically relate to coastal adaptation and resilience, including explicit mention of the SMPs; ▪ Formation of the Marine Planning Decision Makers Group to support integration across policy areas, implementation of the plan and identify guidance and training needs for users; ▪ Review process should allow more spatially-explicit and joined-up thinking (both cross border and across land-sea interface); ▪ Marine licensing for coastal defences will take into account SMP2 policy; ▪ There is an expectation that the WNMP and development plans should complement one another and facilitate integrated coastal zone management.	▪ Lack of engagement between terrestrial and marine planners is a challenge for better linking marine management and FCERM. ▪ Resource constraints make it difficult for people to work on areas outside their normal remit. ▪ Resource constraints limit opportunity and capacity for collaboration and integration between FCERM and Marine management. ▪ View that NRW have become too bureaucratic with regards to obtaining licenses.

5 Opportunities & challenges for aligning FCERM with Well-Being

The following section focuses specifically on the relationship between FCERM and the Well-being agenda in Wales. Firstly, we provide insight into how key stakeholders in FCERM regard the *Well-being of Future Generations (Wales) Act 2015* and general attitudes towards the national well-being goals. Drawing from the previous section, we then summarise the opportunities and challenges for delivering each of the well-being goals in turn (Figure 5.1).

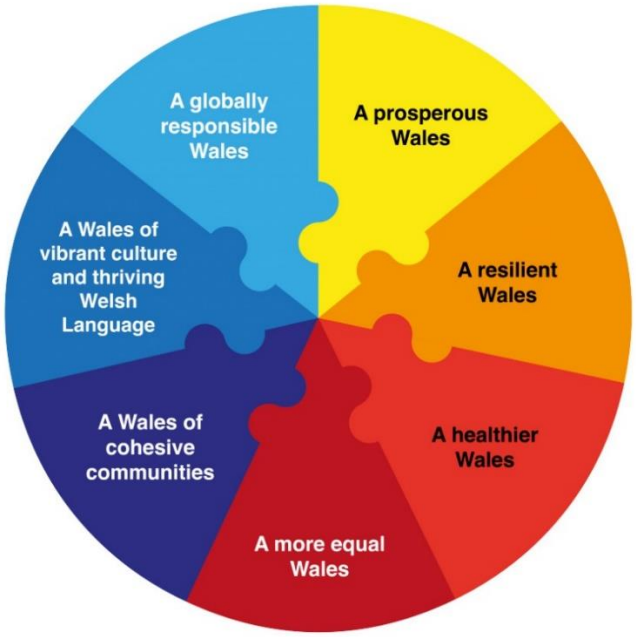

Figure 5.1: The national well-being goals (from Welsh Government, 2015a: p3)

5.1. Integrating FCERM into the well-being agenda

5.1.1. Perceptions of the Well-being of Future Generations Act

There was an overwhelming consensus amongst those interviewed that the *Well-being of Future Generations (Wales) Act 2015* represents a world-leading and ground-breaking piece of legislation. Whilst several remarked that the Act was not new *per se* and reinforced previous practices, there was a consensus that the statutory Five Ways of Working are necessary for ensuring this happens in practice. Overall, the Act was viewed very positively and seen as an opportunity to engage a wider range of stakeholders, unlock different sources of funding and deliver multi-beneficial projects. In this regard, the Act can be thought of as an important bridging mechanism that provides '*a shared vision for collaborative working'* (WLGA). These points are illustrated in the quotes below.

> "I don't think it's anything new, it's something that we've always done [...] it's really good to have that as a legislation and as a key driver […] In practice you've got to be able to demonstrate how you meet the legislation and how you meet the principles and that's probably the main difference to the system before" (WCGF)

> "The wellbeing agenda tries to force a more hopeful and outward looking message… Risk, vulnerability and resilience invite short term approaches… The forward-looking focus of the wellbeing power is therefore welcome. But, I suspect that we are asking the Well-being goals to do everything ….[nonetheless] If it can help to change peoples' perceptions of how to work together to create change and to be forward-looking then it will have done a great job" (National Flood Forum)

> "In some respects having well-being goals is very aligned with current practice but I think there is a lot more to that agenda that needs to be sort of woven into this sort of thinking and ways of working" (NRW)

> "I don't think it did re-brand… there are pockets of best practice reflected in there, but the act and environment act were breaking new ground" (DCWW)

> "I think there's a great deal of pride around Wales in the Well-being Act and a lot of commitment for people to make it work. … because it's such ground breaking legislation, effectively integrating in those policies is going to take time and understanding" (FCE Committee member)

More broadly, we asked interviewees whether they felt the term 'well-being' added value to FCERM, alongside terms such as vulnerability and resilience which have dominated FCERM discourse to-date. Most felt that 'well-being' offered an opportunity to broaden the discussions around FCERM and ensure a longer-term, forward-looking perspective. 'Well-being' was further seen by some as an opportunity to reframe the language around FCERM and chance to move away from the short-term management of consequences and project-based approaches, towards longer-term "*planning for the future and adaptive pathways*", involving other sectors and encourage "*everyone to have a role*" (NFF). In this regard, the well-being legislation is viewed by some as a mechanism for leveraging change and driving coastal adaptation (as indicated in the quote below).

> "I think it was quite timely because it, the way we adapt the coastline is going to have to change, we cannot just go along and build a new seawall […] I it's going to involve quite a shift in the way people think about schemes because at the moment we're still sort of predict and provide. Well predict and provide isn't going to work … so the Wellbeing Act is going to drive coastal adaptation I think" (PCC).

However, there were some mixed views on the individual well-being goals themselves. Overall, most interviewees described an intuitive 'fit' between the goals and the objectives of FCERM, especially the Resilience well-being goal. This was examined further during the Stakeholder workshop, where we used an online polling system to ask participants to reflect on the 7 well-being goals in Wales in terms of 'fit' (alignment) and extent to which the goals are currently being addressed (delivered) in practice. Participants were asked to assess these questions within a matrix format and place a 'pin' within the matrix accordingly. A total of 7 matrices were produced for each of the national well-being goals (Figure 5.2).

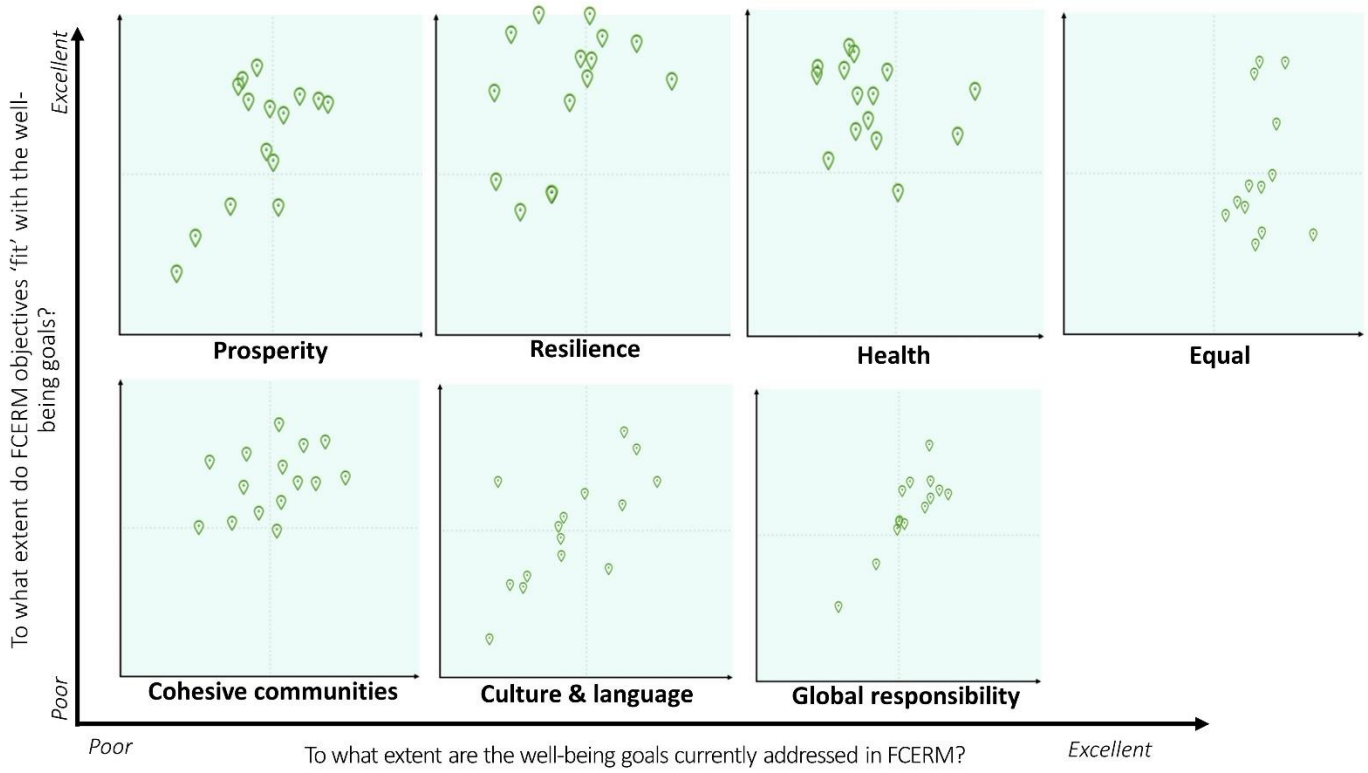

Figure 5.2: Results from online polling to assess 'fit' and delivery of well-being goals within current FCERM in Wales

Analysis of these matrices and the discussions that occurred during the workshop is presented in Alexander et al., (2019), however the key points are summarised below:

- There is clear variation in how the well-being goals are perceived within the FCERM community;

- The goals that are perceived to be well-aligned and well-addressed in FCERM include *global responsibility*, *cohesive communities* and *resilience*;
- *Culture and language* was seen to be the poorest 'fit' and least well-addressed well-being goal;
- *Health* was regarded to be a good fit, yet poorly delivered in practice, with some participants remarking on recent research that demonstrates the long-lasting health impacts of flooding and feeling that this needs to be better addressed in Wales (Public Health England, 2017);
- *Equality* represented the well-being goal that was thought to be best addressed through FCERM. This was typically articulated in reference to funding programmes and view that the Community at Risk Register offers a fair means of prioritising investment;
- *Resilience* was classified as 'poorly addressed' by 60% of participants despite being seen as a strong 'fit' with FCERM; this reflected mixed views on the wording used to define this goal, the ambiguity around the term 'resilience' and the various challenges delivering social, economic and ecological resilience in equal measure.

Discussions of certain goals, particularly *culture and language*, sparked an interesting debate about whether all well-being goals need to be equally delivered through FCERM activities, providing that each goal is *considered* in some form. While recreation activities can be clearly delivered through certain FCERM schemes, the group commented that other aspects may prove more challenging and potentially beyond the FCERM remit, especially given resource constraints – a point that was stressed strongly by Welsh Government. There was also a view that it wasn't necessarily clear to what extent each goal needed to be addressed through FCERM, as some goals are perceived as being more relevant than others.

> "[I] think there's definitely tensions around messaging coming from both Welsh Government and the Future Generations commissioner about what is our aim, is it to *maximise* the achievement of all the goals or is it to just demonstrate that all the goals have been *considered* … [The Commissioner's] view is that every single goal, the seven goals have to be maximised in every scenario, I was like hmm that's not always possible" (Welsh Government)

> "I just feel like there needs to be some clarity around what the expectations are against each of those goals" (NRW).

This debate links back to earlier discussions in Section 4 and highlights fundamental questions about the policy boundaries of FCERM – Essentially, to what extent should FCERM remain bounded by the *protection* of people and property from flood and coastal erosion risks? Or alternatively, should there be a shift in problem framing, away from the dominant focus on protection towards recognising flood and coastal erosion risks as part of a wider climate adaptation challenge, requiring integrated socio-cultural-environmental-economic solutions?

As the following sections will highlight, there are numerous ways in which FCERM is already contributing (or has the potential to contribute) to the wider well-being of Wales, yet these are often under-represented or constrained by current forms of governance. At a systemic level, access to funding is a recurrent concern. Within the FCERM programme, interviewees reflected on the challenge of quantifying often intangible aspects of well-being (see quote 1 below), as well as the lack of direction within the funding formula/criteria (quote 2, below). Further research is required to address how intangible aspects of well-being might be appropriately transformed into quantifiable values, or towards developing robust approaches for integrating qualitative values into decision-making. However, there this is also a need to re-think how funding is portioned towards well-being and whether this needs to be further delineated according the well-being goals, or at the very least assigned a greater weighting within overall funding determinations. Outside the FCERM programme, access to alternative funding streams is further constrained by the siloed nature of governmental budgets (as discussed in Section 4.2).

> "[I]t's really difficult in the context of FCERM, everything has got to be quantified. They have got to be justified as well, the cost-benefit ratio, so I think that's the limitation of the Act at the moment is that it's forcing us to look at areas where, which cannot be quantified" (quote 1, WLGA).

> "if Welsh Government said in their grant in aid funding for flood risk, okay as part of this we want to see that not only have you protected this number of people and properties … but also that you've contributed to sequestering x amount of carbon and that you've done something for biodiversity and something for access and something for you know, to promote the health and wellbeing in a meaningful way. You know if it said something against each of those goals, you know it's about what they wanted that overall budget to achieve then that would be really good because at the moment I think the carbon footprint is really, really important. There's no hook for it, you can't score any points for it when you're approaching your options really, it's just, yeah that's a kind of a by-product that we can mention in a case study possibly … it's all about funding, it is all about the funding because the money, if the driver isn't there you know" (quote 2, NRW)

Some concern was also expressed about how different well-being goals are prioritised according to the needs of different communities and ensuring a defensible approach. Indeed, while the Act requires equal consideration of the well-being goals, it is important to recognise that this will not necessarily result in equal delivery of each of the goals – nor would this necessarily be appropriate. Nonetheless, the place-based weighting of well-being goals needs to be transparent in order to enable legitimate and just decision-making.

Key learning points:

There is a consensus that the Well-being legislation is ground-breaking and brings new opportunities to FCERM in terms of ensuring long-term planning and unlocking opportunities for collaboration.

There is a perceived intuitive 'fit' between the well-being goals and the objectives of FCERM, yet there is some debate within FCERM about whether all well-being goals need to be *equally* delivered through FCERM activities, given its core focus on the protection of people and property. This raises a fundamental question for FCERM to address – should (and if so how) the remit of FCERM and problem of flood and coastal erosion risks be redefined? Many interviewees have emphasised the need to reframe the problem and solutions in FCERM in order to adapt to climate change.

Further research is required into appropriate methods for including less tangible well-being benefits within FCERM project appraisals (whether in quantitative or qualitative form) to enable equal consideration of all well-being goals. Equal delivery of the well-being goals at the local scale will not always be possible, but the place-based weighting of well-being goals needs to be transparent for legitimate decision-making.

There is also a need to re-consider the current funding criteria/weighting assigned to well-being within the FCERM programme and address the continued constraint of budget silos at a government-level.

5.1.2. Embedding FCERM in Local Well-being Plans, the PSBs and other projects

As part of the desk-based analysis we examined the effectiveness of current mechanisms within well-being governance, focusing on those that address flood and coastal erosion risks. This included the national well-being indicators, Local Well-being Plans and the statutory and non-statutory guidance for implementing the *Well-being of Future Generations (Wales) Act 2015*.

At the national scale, flooding is included within the 46 national well-being indicators (Welsh Government, 2016b). Indicator 32 refers to the total number of properties (homes and businesses) at medium or high risk of flooding from rivers and the sea; where high risk represents a greater than 1:30 change of flooding and medium risk represents between 1:30 to 1:100 chance of flooding (as determined by NRW flood risk mapping). Flood risk is therefore recorded within the national well-being assessment, of which annual progress reports are made by Welsh Ministers. However, it is noteworthy that coastal erosion and other forms of flood risk

are absent; thus, only a partial picture of risk is provided. Although such indicators are important for painting a national picture of risk and informing national priorities, there is no means of capturing the scale of adaptation required in the future. Moreover, focusing purely on the numbers at risk could further reinforce conventional judgements of success in FCERM based on the numbers defended, which is ill-suited to monitoring progress towards coastal adaptation. To address this, there is a need to consider whether an additional, complementary indicator(s) is required to record the numbers of property or assets subject to future coastal change under future SMP2 epochs. Coastal change presents a significant threat (and potential opportunity) for national well-being and should be included within the national well-being indicators moving forwards.

At the local scale, we examined the extent to which floods and climate change adaptation more widely have been included within the well-being plans produced by the Public Service Boards (as described in Section 2.3). There is considerable variation between the 19 PSBs. The general number of references to flooding are low overall, but more frequent citations are made by the Flintshire PSB, compared to five other PSBs which make no reference to flooding in their plans. In total, 63% of the PSBs well-being plans make less than five explicit references to flooding or fail to mention it all together; although, it may be the case that FCERM matters are included within broader constructs of climate change adaptation. However, again, we observed considerable variable between PSBs; whereas climate change is referred to most within the Torfaen well-being plan (75 citations), 68% of plans make 10 or less references to climate change matters. These observations confirm the feedback provided by several interviewees about the wide variation in the way in which PSBs have engaged with FCERM and climate change matters.

In part, this reflects the strategic leadership from the Future Generations Commissioner for Wales. Six priorities are outlined for the current term of office, including housing stock; energy generation and efficiency; transport planning; skills; adverse childhood experiences; and alternative models for improving health and well-being (namely social prescribing) (Future Generations Commissioner, 2018a). Indeed, it is noteworthy that the Future Generations Office declined the invitation to participate in this research and explained that the broad remit of the Office means there is a need to focus on these core priorities – of which flood and coastal erosion risks, and climate change adaptation more widely, are noticeably absent. This is surprising given recent events associated with climate change, such as the global school strikes of which a number of Welsh communities have participated in, and Welsh Government's declaration of a Climate Emergency earlier this year.

This has several implications for FCERM. The PSBs have the potential to be a useful bridging mechanism for facilitating joined-up, cross-departmental and cross-policy working at the local scale. This view was shared unanimously across interviewees, who felt that the PSBs provided a valuable opportunity to '*get people around the table'* and embed complex discussions, such

as coastal adaptation, within the wider well-being agenda. In this regard, the Gwynedd and Anglesey PSB were frequently cited as an example of best practice. Likewise, public authorities must have regard to local well-being plans (e.g. Planning Policy Wales; Welsh Government, 2018c). Therefore, there is a danger that opportunities will be missed if FCERM is side-lined from these meetings and resulting PSB outputs. Several interviewees felt that NRW (as statutory members of PSBs) could play a greater role in this regard. Although there is a clear willingness amongst FCERM to engage with the PSBs and other actors, some interviewees expressed their concerns that this is often led by RMAs (as opposed to other actors approaching the FCERM community). This suggest a lack of awareness from those outside FCERM about the various ways in which different aspects of FCERM can support well-being. This observation coincides with a recurring theme in the forthcoming sections that suggests that FCERM under-represents its wider contribution to well-being. To address this, there is a need for the FCERM community and National FCERM Strategy to better articulate the wider well-being benefits of their activities. In turn, this may help to essential attract others not traditionally involved in FCERM to initiate co-beneficial schemes. In short, there is a need to enhance the 'pull messaging' around FCERM.

On the project scale, specific guidance is available through the Future Generations office to promote consideration of well-being within project design, delivery and management (Future Generations Commissioner for Wales, 2018b). A series of guiding questions are outlined to indicate how public authorities might: i) contribute towards (or at the very least not undermine) their well-being objectives or the well-being objectives set by others; ii) deliver the Five Ways of Working; and iii) maximise contribution to the 7 well-being goals. The project guidance calls for bodies to '*look at the bigger picture and connect the dots'*, while actively working to support the intentions of the act. The series of questions provided are intended to challenge public bodies to consider where projects might deliver wider well-being benefits; for instance, under the Resilience well-being goal a public body is asked to consider how the project will help Wales to adapt to climate change, for example the effects of increased flooding and severe weather events (Future Generations Commissioner for Wales, 2018b). In this sense, this document acts as a supporting mechanism for stimulating considerations of additional benefits for flood and erosion risk management within projects external to FCERM. Similarly, the Business Case Guidance for FCERM projects requires practitioners to consider the *Guidance on using the Future Generations framework for projects*. The mutual reinforcement between the two is a key pathway for aligning well-being and FCERM concerns at the project scale.

Key learning points:

Flood risk is represented within the national well-being indicators to provide a national picture of fluvial and coastal flood risk, only. Coastal erosion and other sources of flooding are excluded. There is also no indicator for capturing the scale of coastal change highlighted by SMP2 policies. Coastal change presents a significant threat (and potential opportunity) for national well-being and should be included within the national well-being indicators moving forwards.

Public Service Boards (PSBs) have the potential to play an important part in FCERM governance and facilitating joined-up working. However, the extent to which flooding (and climate change adaptation more widely) has been embraced by PSBs is ad hoc. More effort is required to raise the profile of FCERM within PSBs and local well-being plans. NRW as a statutory member of PSBs could facilitate this. Moreover, at the national scale, climate change adaptation should be included as a strategic priority within the Future Generations Commissioner's priority areas to better promote its inclusion in well-being planning at the local scale.

There is a need for the FCERM community and National FCERM Strategy to better articulate the wider well-being benefits of their activities to attract engagement from others ('pull messaging').

5.1.3. Wider progress of the Well-being agenda and implications for FCERM

In 2018, the Future Generations Commissioner for Wales published a review of the progress being made by public bodies and PSBs in the two years following the enactment of the *Well-being of Future Generations (Wales) Act* in April 2016 (Future Generations Commissioner, 2018a), alongside the preliminary assessment made by the Auditor General for Wales (2018b). In this section, we consider the implications of these Reviews, and other developments with the implementation of the Act, for FCERM and forging a stronger alignment with the well-being agenda.

In "*the journey so far*" the Future Generations Commissioner re-asserts the importance of seeing the Act as an opportunity to transform 'business as usual' and as a vehicle for changing institutional cultures and behaviour. The Commissioner challenges public bodies to be self-reflecting and strive to be leaders, moving away from 'doing the obvious'. However, reporting on current progress, the Commissioner concludes that "***no one organisation is fully embracing the act*"**, with '***the majority of public bodies stuck to their core business'***. Looking across the 345 well-being objectives from the 2017 Well-being Statements, the

Commissioner noted that less than 20% of these related to the environment, with the majority of public bodies failing to consider their contribution to the Resilience well-being goal (except NRW and National Park Authorities). Likewise, the first well-being assessments lacked consideration of the impact of climate change on well-being at the local scale (Future Generations Commissioner, 2017). The Commissioner has since re-emphasised the need for public bodies to consider (and better communicate) what more they can do to *maximise* their contribution to each of the well-being goals.

Importantly, the Commissioner asserts the need for organizational-level change, "*rather than relying on innovative individuals within particular departments*" (Future Generations Commissioner, 2018a: 11). This is particularly relevant to FCERM where key champions for change continue to play a crucial role. As observed by the Commissioner, '*leadership of the organisation is vital'* for empowering action, innovation, well-managed risk-taking and learning opportunities (Future Generations Commissioner, 2018a: 13). This point resonates with our earlier argument about the need for stronger strategic leadership from Welsh Government in relation in adaptation challenges (Section 4). Indeed, the Future Generations Commissioner further states that "*Welsh Government also has a responsibility to create the right conditions to allow the aspirations of the Act to be met*", particularly in terms of seizing opportunities through the budget setting process (Future Generations Commissioner, 2018a:18).

Accompanying the Future Generations Commission's review, the Auditor General for Wales also conducted a preliminary assessment of how the 44 public bodies have responded to well-being legislation one year on from setting their well-being objectives. It was similarly concluded that well-being statements lacked transparency and often failed to demonstrate systematic application of the sustainable development principle (Auditor General for Wales, 2018b). However, of particular relevance to this research, are the barriers that public bodies described to the Auditor General that are seen to impede delivery of the Act and the Five Ways of Working. These included constraints to long-term planning created by short-term funding allocations, as well as the inflexibility of grant funding spending. Other barriers were raised in terms of the complexity of legislation and governance arrangements, making it difficult to align and join-up activities across numerous bodies and partnerships. These issues were similarly raised by FCERM practitioners and policymakers interviewed as part of this research and are summarised in Section 5.3 (see Table 5.1). It is important to remain cognisant of the overarching and systemic nature of some of these barriers, which transcend policy sectors and are certainly not unique to FCERM.

On a final note, it is important to acknowledge that the '**statutory teeth' of the Act** has recently been called into question. In March 2019, an attempt was made to use the Act to bring a Judicial Review against Neath Port Talbot Council to challenge the closure of Cymer Afan comprehensive school in Neath Port Talbot. The case was dismissed on two grounds. Firstly, it was judged that the Act "*is deliberately vague, general and aspirational"* (Mrs Justice

Lambert). Secondly, although the court concluded that Judicial Review was an inappropriate mechanism for enforcing the well-being duties of the Act, it determined that the closure of the school was consistent with the council's state well-being objectives regardless. This case sets a precedent and highlights the limitations of the Act when it comes to holding public bodies to account.

Instead, accountability and compliance of public bodies is reliant on several other mechanisms. Firstly, the Future Generations Commissioner has a role in the monitoring and assessment of whether well-being objectives are being met, although does not have an enforcement role *per se* and has no powers to scrutinise PSBs or legal duty to advise individual public bodies. The Commissioner herself has been critical of this governance gap - "*this is an anomaly which does not assist me or public bodies and PSBs in the slow of our duties*" (Future Generations Commissioner, 2018a:8). Also, at the national scale, the Auditor General for Wales has powers (under Section 15) to examine whether public bodies have acted in accordance with the sustainable development principle, although again this excludes PSBs, which are instead subject to the scrutiny of Local Authority Overview and Scrutiny Committees (under Section 35; Welsh Government, 2016i). It is perhaps too early to judge whether these mechanisms are sufficient, nonetheless there is a risk that the perceived lack of statutory teeth may undermine efforts to maximise contributions to the well-being goals. Indeed, the example of the school closure at Neath Port Talbot was mentioned by several interviewees, who felt that there was a risk of 'cherry picking' certain well-being goals to either justify or contest certain decisions – "*you can use the same bit of legislation and come to a completely different conclusion*" (NRW). This reaffirms the importance of establishing clear expectations about how the well-being goals should be deliberated, considered and delivered at the local scale.

Key learning points:

There continues to be a gap in well-being governance between policy and delivery, with no one organisation fully embracing the Well-being Act. The Act demands change at the organisational-level and strong leadership from Welsh Government.

Certain barriers to the implementation of the Well-being Act and the Five Ways of Working are shared across policy sectors and are not unique to FCERM, particularly with regards to short-term funding arrangements, rigidity of grant spending and governance complexity which can impede efforts to align and joined-up activities.

There is a risk that the perceived lack of statutory teeth in the Well-being Act may undermine efforts to maximise contributions to the well-being goals. It is crucial to establish clear expectations about how the well-being goals should be deliberated, considered and delivered at the local scale.

5.2. Opportunities and challenges for delivering the well-being goals in FCERM

In this section, we review each Well-Being Goal in turn and highlight key strengths and weaknesses in current governance, as well as opportunities and challenges for delivering FCERM and the well-being agendas in tangent.

5.2.1. A more prosperous Wales

An innovative, productive and low carbon society which recognises the limits of the global environment and therefore uses resources efficiently and proportionately (including acting on climate change); and which develops a skilled and well-educated population in an economy which generates wealth and provides employment opportunities, allowing people to take advantage of the wealth generated through securing decent work.

Funding has been an important mechanism through which FCERM has been aligned to economic growth and regeneration agendas. European Regional Development Funding in particular has enabled several large FCERM schemes to be delivered (such as Colwyn Bay waterfront and West Rhyl Coastal Defence Scheme; Welsh Government, 2019a), providing a much need boost to local economies and providing employment opportunities.

The contribution of FCERM to national prosperity can also be understood in terms of costs avoided from specific flood events. Following these floods, the Wales Coastal Review estimated that the protection afforded by the defence and asset network amounted to avoided damages of £960m (December 2013 floods) and £2bn (January 2014 floods) (NRW, 2014a). However, interviewees expressed their concerns about the lack of revenue funding for maintenance works and how this is likely to undermine the integrity of the defence network. Moreover, under climate change projections, it is estimated that the expected annual damage to residential properties in Wales will rise between 35 – 110% in the 2050s and 59 - 220% in the 2080s (ASC, 2016). In addition, expected annual damages from direct impacts of flooding to non-residential properties are predicted to increase between 29% and 96% by 2050, and between 55% and 200% by the 2080s (reflecting scenarios of 2°C or 4°C respectively, excluding population growth and assuming the continuation of current levels of adaptation) (Sayers et al., 2015). This reaffirms the necessity of establishing a long-term commitment to revenue funding. Furthermore, implementing Shoreline Management Plans (SMP2s) will require significant funding contributions, rising from £20m to £30m annually over the next 50 to 100 years (Auditor General for Wales, 2016; 11). Efforts to diversify funding sources will be essential to delivering this (see Section 4.2).

Resilience measures are also a crucial pathway through which costs are avoided. Flood Awareness Wales has supported over 1,000 communities, schools and businesses in

developing flood plans (Collingwood Environmental Planning, 2016). Under the Civil Contingencies Act 2004, local authorities are also required to advise and assist local businesses and voluntary organisations to help them plan for emergencies and support the continuation of their activities. Further support is available to small and medium scale businesses in the UK through the Prince of Wales Business Emergency Resilience Group[65], which provides guidelines for businesses to create their own emergency plans. A Business Continuity Management Toolkit has also been developed by UK Government (HM Government, no date).

The definition of Prosperity also refers to the efficient use of resources. The principle of *proportionality* is embedded in FCERM to ensure that planning and managing for floods is proportional to the risk at hand. This is supported through tools such as the Communities at Risk Register, which informs emergency planning and steers the allocation of funding towards areas at greatest risk of flooding. The four-year and three-year capital programmes for FCERM and CRMP respectively, also offer a degree of certainty over funding that gives more opportunities to package approaches and make cost-savings through longer-term contracts with suppliers (that would otherwise be limited through annual-allocation systems: ASC, 2014).

Another facet of Prosperity concerns the development of 'a skilled and well-educated population'. Welsh Government have acknowledged the importance of engaging directly with children and young people about climate change matters, particularly through the Eco-Schools[66] and Size of Wales[67] initiatives and reformed curriculum (Welsh Government, 2019b). However, this is not explicitly discussed in the revised National FCERM Strategy, despite there being good examples of where education and outreach work has taken place. For instance, NRW have produced a range of educational resources (including case studies and activity plans) for Key Stages 2-4[68]. School engagement activities are also highlighted in the last Section 18 report (see NRW, 2016d). During the interview process, we were also encouraged to hear how the Wales Coastal Monitoring Centre is engaging a local school in Tonyrefail with climate change and coastal management, and establishing links with the climate change department in American Samoa to connect "climate aware kids" across the world[69]. Such

[65] The Business Emergency Resilience Group is as a network of UK business leaders and strategic partners, including national charities and UK government departments. For further information see https://www.bitc.org.uk/campaigns-programmes/communities-place/business-emergency-resilience-group

[66] The Eco Schools is a global programme that was founded in 1994 to empower young people to make positive environmental changes to their school and wider community.

[67] Size of Wales is an educational programme to raise awareness of climate change challenges and importance of the world's forests (see https://sizeofwales.org.uk/).

[68] NRW's educational resources are available from https://naturalresources.wales/guidance-and-advice/business-sectors/education-learning-and-skills/looking-for-learning-resources/learning-resources-search-by-topic/flooding/?lang=en

[69] https://www.youtube.com/watch?v=v9q9NqMtPv0&feature=youtu.be

activities have the potential to deliver a range of educational benefits, while simultaneously raising awareness of flood and coastal erosion risks, and could be supported through additional sources of funding (such as the British Ecological Society outreach grant for example). Another hopeful example, are the proposals in Fairbourne to create a Climate Change Adaptation Centre (FMF, 2018; 2019). Although the proposal remains subject to funding and requires a feasibility study, there is hope that this could help to not only raise awareness of climate change and coastal adaptation, but also provide a potential opportunity for tourism (FMF, 2018; 2019).

In the current revised National FCERM Strategy, Prosperity and FCERM is framed in terms of "[*B]uilding resilience and reducing risk to people and places, help the economy and sustain long term employment. Construction of flood schemes creates jobs and safer places to work and invest*" (Welsh Government, 2019a: 8). This section has shown various other ways in which the two agendas are successfully aligned and should be better celebrated and promoted at the national scale.

Key learning points:

Aligning FCERM with economic growth and regeneration agendas has unlocked opportunities for funding and enabled the delivery of multi-beneficial schemes.

In order to keep pace with climate change, sea level rise and rising costs of flooding, long-term capital and revenue funding needs to be secured to support a *diversified* approach to FCERM, including the maintenance of defences (where it is sustainable to do so), as well as supporting community resilience and adaptation initiatives. This will require diversification of funding sources (including private sector contributions) and seizing opportunities to deliver FCER benefits through other schemes.

Considerable efforts have been made (and should be sustained) within the FCERM community to support the education of children and young adults to enhance awareness of flood and coastal erosion risks, climate change more broadly and sense of global responsibility.

5.2.2. A Resilient Wales

A nation which maintains and enhances a biodiverse natural environment with healthy functioning ecosystems that support social, economic and ecological resilience and the capacity to adapt to change (for example climate change).

Healthy functioning ecosystems are regarded as the foundation for resilience in the *Well-being of Future Generations (Wales) Act 2015* and related policy. Therefore, it is important to understand how FCERM influences the creation and maintenance of healthy ecosystems. Over

the past fifteen years there has been a discursive shift in UK moving FCERM away from a defence paradigm, towards a holistic risk-based approach that has increasingly emphasised the value of nature-based approaches and making space for water (Defra, 2005; Alexander et al., 2016).

Working with natural processes is an approach that *aims to protect, restore and emulate the natural functions of catchments, floodplains, rivers and the coast* (Burgess-Gamble et al., 2018: iv). A joint research programme into Working with Natural Processes (EA/Defra/NRW/WG) was completed in 2018, leading to various online resources, case studies and the completion of an evidence directory[70] (Burgess-Gamble et al., 2018). Expanding the application of Natural Flood Management (NFM) is a key objective of the revised National FCERM Strategy, alongside the use of hybrid schemes and green infrastructure (Welsh Government, 2019a). To incentivise this, the revised FCERM Business Case Guidance further specifies that NFM options should be short-listed (Welsh Government, 2019c). Such schemes are eligible for FCERM grant funding providing flood risk reduction is the primary objective of the scheme, and may be further delivered through the Small Scale Works Grant (Section 4.2).

The strong steering towards NFM in FCERM is well-aligned to natural resources policy and the sustainable management of natural resources (as discussed in Section 4.4), as well as supporting the Nature Recovery Action Plan (Welsh Government, 2015c) and low carbon transition in Wales (Welsh Government, 2017c; 2019b; discussed further in Section 5.3.7). Policy cohesiveness is further reinforced through key governance mechanisms such as the Section 6 Duty of the *Environment (Wales) Act 2016* which encourages public authorities to incorporate and report on biodiversity measures. Furthermore, Public Service Boards are required to take Area Statements into account while preparing local Well-Being Plans. The alignment between FCERM and environmental agenda could in turn, bring '*opportunities for FCERM to influence and benefit from projects where other drivers, for example, biodiversity is the lead, to ensure flood mitigation is considered'* (NRW, 2016d: 5).

However, this does not always translate into action on the ground. There are numerous difficulties with implementing NFM that have been highlighted in previous sections, particularly with implementing the National Habitat Creation Programme, managed realignment policies and catchment-based approaches (see Section 4; Table 5.1). These challenges relate to a range of factors, such as misalignment between planning cycles, conflicting priorities/remits of actors and statutory duties to maintain Public Rights of Way and other Duties of Care, or even societal and potentially political pressures to maintain the status quo. Consequently,

[70] *Working with natural processes to reduce flood risk*: available from https://www.gov.uk/government/publications/working-with-natural-processes-to-reduce-floodrisk

implementation of such schemes can be incredibly slow and could potentially undermine efforts to offset future habitat losses, when natural habitats themselves take time to establish (see quote below).

> "[R]esilient Wales, this is the big one, because in terms of climate change, in terms of sea level rise, our main mechanism for mitigating for those are in relation to marine habitats is through the offset and creation of new ones and for us to be able to provide a resilient environment which is the marine environment will take time, it'll take decades so it's, if you like the timing isn't brilliant, because producing new habitat doesn't suddenly provide you with the same quality, it's something that takes time to evolve (NRW)

Beyond ecological resilience, FCERM supports social and economic resilience in various ways, from spatial planning, defence/mitigation measures, through to effective arrangements for emergency preparedness, response and recovery (Figure 2.4). In Section 4 we outlined various strengths and weaknesses of the current governance arrangements in place, alongside key lessons for strengthening these to improve resilience and well-being in Wales. These are not repeated here but are summarised in Table 4.5.

Key learning points:

There is a strong 'fit' between FCERM and the Resilience well-being goal, particularly around ecosystem resilience, that is supported by strong policy cohesiveness between FCERM and Natural Resources Policy, and key governance mechanisms (e.g. S6 duty of the *Environment (Wales) Act 2016*, Area Statements and NHCP).

Natural Flood Management (NFM) has risen up the FCERM agenda, however implementation barriers remain; thus, creating a gap between policy and delivery (as outlined in Section 4.4). In order to keep pace with sea level rise, these barriers will need to be overcome.

5.2.3. A healthier Wales

A society in which people's physical and mental well-being is maximised and in which choices and behaviours that benefit future health are understood.

"Treating" health in response to flood incidents

The health impacts of flooding have been well documented. From a physical health perspective, floods may pose risks to life, injury and physical illnesses associated with contact with contaminated waters (e.g. diarrhoeal disease), as well as potential risks post-flooding such as exposure to carbon monoxide fumes from equipment to dry out buildings (PHW, 2019). The potential disruption caused to utility supplies can also pose significant risks to those far beyond the flood waters, particularly those on life supporting equipment (e.g. dialysis patients). Floods

trigger a range of socio-economic stressors, such as disruption to support networks or even relationship break-downs, loss of earnings or difficulties with insurance claims to name a few, which in turn have been attributed to various mental health illnesses such as depression, anxiety and Post Traumatic Stress Disorder (PTSD) (Waite et al., 2017).

Mitigating these effects partially requires effective arrangements in place for emergency response and immediate recovery, which are well established in Wales. Health guidance is available to both the public and Category 1 Responders through Public Health Wales (PHW, 2018). A list of guiding principles and actions are outlined through the 'psychological first aid kit' in Public Health Wales's advice to first line responders (PHW, 2018; informed by the WHO et al, 2011), to support the early stages of recovery and alleviate the immediate distress caused by flooding. Moreover, PHW emphasise the role of social care services (who lead emergency recovery) and importance of maintaining, or re-establishing, family and community cohesion. Local community groups and the voluntary sector can play a valuable role, in addition to local health services, in terms of mitigating or alleviating the mental health effects of flooding.

However, research has highlighted a longer-term 'recovery gap'. Longitudinal research following the Summer 2007 floods in Hull, draws attention to the long-term struggles and highs and lows encountered by communities as they deal with the impacts of flooding, displacement, negotiate with insurance companies and the rebuilding process, while trying to maintain a sense of normality and recover a sense of home (Medd et al., 2015). Arguably, it is during the recovery process where the impact of flooding is felt most keenly, yet the recovery phase of emergency management tends to be overlooked by the emphasis placed on emergency preparedness and response. The authors call for greater recognition of the longevity of flood recovery and formal frameworks to support communities as they readjust.

Other studies have further highlighted the significant long-term impacts of flooding on emotional and mental health. Numerous factors influence a person's susceptibility and experience of post-flooding mental health illnesses, such as the nature of flood itself (duration, depth), its impact upon one's personal life, as well as pre-existing health problems. Moreover, it is not only those in direct contact with flood waters that are affected. An ongoing longitudinal National Study of Flooding and Health, established by Public Health England in 2015, is examining psychological morbidity (including depression, generalised anxiety and PTSD) amongst those directly or indirectly affected by the Winter 2013/14 storms. Analysis one-year on revealed elevated depression, anxiety and PTSD amongst both flooded and disrupted participants, particularly amongst those who had experienced greater flood depths and disruption to domestic utilities (Waite et al., 2017). Munro et al. (2017) further highlight higher incidences of these disorders amongst those who were displaced from their home. Furthermore, higher scores for depression and PTSD were evident amongst individuals who also reported receiving no warning; thus, indicating the potentially protective effects of advanced flood warnings. Even two-years on, the prevalence of probable psychological morbidity remained evident in both

flooded and disrupted participant groups, with higher odds displayed amongst those who had experienced persistent damage in the home. Although these figures were somewhat reduced since year one, particularly anxiety (Jermacane et al., 2018), the research demonstrates the lasting effects of flooding. The research further suggests that probable psychological morbidity might be reduced by resolving persistent damages to flooded homes, but more widely, calls for greater awareness amongst health and social care services of the increased need amongst populations exposed to flooding (Jermacane et al., 2018).

Translating these findings to Wales, it is clear that efforts to enhance the reach and quality of the flood warning service are essential, as well as maintaining the current effectiveness of emergency response and recovery arrangements. However, in agreement with Jermacane et al. (2018), it may be necessary to strengthen awareness of the long-term mental health impacts of flooding amongst health and social care services.

Enhancing psychological well-being in the face of risk

Although England's National Study on Flooding and Health provides a much needed statistical, longitudinal analysis of the health and well-being effects associated with *flood experience*, it is important to acknowledge that perceived threats of flood and coastal erosion risks can equally erode psychological well-being. Raising awareness of risks, and crucially raising awareness of the actions one can take to help alleviate this risk, is necessary for constructing personal resilience (including perceptions of self-efficacy and coping capacity) (e.g. Grothmann and Reusswig, 2006). This is explicitly recognised within the revised National FCERM Strategy:

> "Providing services that raise awareness of flood risk, providing flood warnings, and information on what to do before, during and after a flood are key to the delivery of the FCERM objective of 'preparedness and building resilience' and helps reduce anxiety associated with flooding" (Welsh Government, 2019a)

There is also a need to be cognisant of the impact of shoreline management policies on community's health and well-being. In Fairbourne for instance, heightened levels of stress and anxiety were reported by the local community following the declaration of managed realignment and associated media coverage, with 86% and 82% of residents interviewed reporting declines in their mental and physical health, respectively (FMF, 2018). This was attributed to the future uncertainty and feelings of being 'trapped', unable to sell their properties or potentially take care of themselves in later life (Williams et al., 2019). One interview described how "*people [of Fairbourne] feel locked-in and a lot of their choices have been taken away from them*" (JBA). Therefore, it is essential that the implications of SMP2 policies are appropriately communicated and openly discussed with local communities in a way that is mindful of the potential health problems that this may create. Representatives from social care services, health and counselling services or local charities could support this process. For example, the *Fairbourne Moving Forwards* partnership funded a counselling service (Medra) in 2015 to help support local residents (FMF, 2016; 2019). Actively involving communities in decision-making

processes can also play a key role in mitigating feelings of helplessness and giving voice to the community. In this sense, collaboration and coproduction in FCERM can also serve as a strategy for building community resilience and supporting mental health (Kelly and Kelly, 2019).

Striving to do more

Thus far, the discussion has addressed how FCERM and 'health' might be more closely aligned from an FCERM perspective, by 'treating' health within the aftermath of flood event and enhancing personal resilience and psychological well-being in the face of flood and coastal erosion risks. However, maximising physical and mental health through FCERM should arguably seek to do more in terms of contributing towards *preventative* health care, by helping to alleviate the wider socio-economic and environmental determinants of health issues and health inequalities. Although central funding is predominantly directed towards delivering health care services, health prevention is recognised as an emerging discourse in Wales and is fundamentally dependent on other sectors and stakeholders, external to the health sector (see quote below).

> "preventing is usually delivered by people outside of health … [e.g.] leisure services get people physically active, enjoying themselves, relaxing and all those things actually contribute to the prevention agenda … But these are the services that in times of financial crisis get cut" (Public Health Wales)

While many of the provisioning or supporting services provided by coastal environments have been recognised for some time (e.g. habitat for biodiversity), in recent years there has been an increasing awareness of the health and well-being benefits that can be derived from being in and around nature, or so-called 'green spaces' (Bell et al., 2018; Bell et al., 2014). In contrast, the role of 'blue space', particularly coastal blue space, is relatively new (Wheeler et al., 2012). Despite relationships between society and water more generally being a key facet in early therapeutic landscape research (Foley and Kistemann, 2015), from the perspective of ecosystem services and natural resource management, the concept of blue space is emerging. Coastal environments often fall between the two, with their position at the land-sea interface meaning they can count as both green and blue space (Foley and Kistemann, 2015). Research has documented the various ways in which different coastal landscapes (e.g. beach or saltmarsh) can contribute to health and well-being, such as the restorative nature of blue space (White et al., 2010), the importance of proximity to the coast (White et al., 2013) and blue spaces as therapeutic landscapes (Bell et al., 2015). Ongoing research within the CoastWEB project is also examining the contribution of different coastal habitats on psychological restoration (see https://www.pml.ac.uk/CoastWeb/Home).

Therefore, the delivery of nature-based solutions has the potential to enhance access to green-blue spaces and support additional mental and physical health benefits (Raymond et al., 2017; Sutton-Grier et al., 2015). There are clear links and opportunities here with the growing emphasis on NFM, such as the creation of intertidal habitats and rewilding of catchments, which

have the potential to provide additional health and well-being benefits. In turn, this could help mitigate some of rising trends in mental illnesses, diabetes and obesity, while simultaneously helping to alleviate the societal costs of these (PHW, 2016; Welsh Government, 2017f).

A clear area through which FCERM can contribute is the Active Travel agenda in Wales, enacted through the *Active Travel (Wales) Act 2013* and the *Active Travel Action Plan for Wales* (Welsh Government, 2016e). The Act focuses on walking and cycling infrastructure[71] to support 'active travel journeys'[72] and associated health benefits, to prompt broader behavioural shifts in Wales. Funding is available through Welsh Government's Active Travel Fund (£60m between 2018-2020) to support mapping and planning duties assigned to local authorities. Welsh Government's Active Travel Plan emphasises the cross-cutting nature of this agenda and potential for multiple-benefits, from building physical activity into everyday lives, reducing air pollution from traffic and carbon emissions, connecting communities and enhancing access to key services (Welsh Government, 2016e).

To some extent, the revised National FCERM Strategy describes how FCERM alleviation schemes can contribute to a healthy and active population (a key priority in *Prosperity for All*, Welsh Government, 2017d) as well as the Health well-being goal. In this context, Welsh Government acknowledge the '*wider benefits such as footpaths and cycle lanes'*, though does not explicitly reference the Active Travel agenda (Welsh Government, 2019a: 6). For example, the Swansea Vale Flood Storage Area is highlighted as a successful hybrid, multi-beneficial scheme, which included upgrading 3km of the national cycle network (see Welsh Government, 2019a: 44). In its description of how FCERM can support the Health well-being goal, Welsh Government writes:

> "Sharing information on risk and what to do before, during and after a flood, together with the real reduction in risk to homes, helps to improve mental well-being. Schemes can help create more attractive and safe communities to live and work in and provide wider health benefits such as recreation and amenity improvements" (Welsh Government, 2019a: 8).

Although the quote above acknowledges the wider health benefits of FCERM, the extent to which these are actively promoted is less clear. There appears to be a flood-centric view on health matters and general impression that wider health benefits are 'nice to haves'. This taps into a wider debate reflected through some of the interviews and the stakeholder workshop about whether FCERM should seek to address all well-being goals in equal measure. Welsh Government in particular were keen to stress the core remit of FCERM as the protection of life

[71] Note that 'walkers' and 'cyclers' include the use of wheelchairs and mobility scooters, and the use of electric bikes.
[72] "Active travel journey" means a journey made to or from a workplace or educational establishment or in order to access health, leisure or other services or facilities.

and properties. While we partially agree with this argument, we feel that Welsh Government could do more to promote FCERM as a pathway for delivering other national priorities around healthy and active communities. To do this, requires closer engagement with non-traditional FCERM actors at a scheme/project scale, as well as Coastal Groups and Public Service Boards. The PSBs in particular, were seen as a valuable bridging mechanism for bringing people together – "*it's about working right across sectors and disciplines and professions … there is potential to frame things in a way if you get all the right people around the table to take it forward together and again the PSB are well placed to do that because in theory they're all sitting together*" (PHW). In turn, this could open-up opportunities for joined-up working and pooling resources. At the very least, links to strategic policies within other Government Departments (such as the Active Travel Plan) should be explicitly highlighted within the National FCERM Strategy to demonstrate the wider contribution that FCERM can make.

Key learning points:

There are mechanisms in place for addressing the health impacts of flooding during and immediately following flood events; however, research has highlighted a 'recovery gap' and demonstrated the longevity of flood recovery and lasting effects of flooding on mental health. Health and social care services should be made aware of the increased needs of flood-exposed populations as they readjust in the days, weeks, months and even years of an event.

Beyond 'treating' the impact of flooding, it is important to consider how communities living with risk and uncertain futures may be supported in their personal resilience and emotional well-being, particularly within coastal communities subject to future managed realignment or no active intervention policies. Shoreline management policies need to be openly and honestly communicated with local communities, with awareness of the health impacts that this may cause. RMAs should identify where health and social care services, or voluntary groups, might assist the communication process and provide additional support to local communities.

There is a growing repository of evidence documenting the mental and physical health benefits associated with green-blue spaces. Therefore, NFM approaches offer potential opportunities for preventative health care initiatives.

5.2.4. An equal Wales

A society that enables people to fulfil their potential no matter what their background or circumstances (including their socio-economic background and circumstances).

Understanding the relationship between FCERM and the goal for an Equal Wales can be approached from procedural and distributive perspectives - namely are the processes in place deemed to be fair and do they result in fair outcomes.

From a procedural perspective, research has focused on the underlying mechanisms through which funding is determined and allocated (Johnson et al., 2007; Penning-Rowsell and Pardoe, 2012; Alexander et al., 2016). In Wales, funding is directed according to the Communities at Risk Register towards those areas at greatest risk of flooding, irrespective of other factors. This was widely regarded amongst interviewees, particularly Welsh Government, as a fairer approach than the Partnership Funding model used in England – "*actually focusing on funding of where the greatest risk is and where the greatest need therefore is.., so, the way that we prioritise our funding promotes that transparency and fairness to anyone, to anybody that's at risk*" (Welsh Government). Although the match-funding model adopted in Wales similarly requests a certain proportion of funding to be raised by Local Authorities, the key difference between the two models is Welsh Government's stance on community contributions and view that communities themselves should not be required to make direct contributions. Concerns for fairness are further evident in the revised National FCERM Strategy, which offers the following examples through which 'equality' is addressed:

> "Funding is prioritised based on level of risk on an all Wales basis thereby removing regional inequality. We also support initiatives to give those at highest flood risk access to affordable insurance" (Welsh Government, 2019a: 8)

The quote above, refers to the recent establishment of Flood Re, which represents a twenty-five-year agreement between the UK Government and insurance industry to ensure access to affordable home insurance in high-risk areas (see Section 4.10). However, it should be borne in mind that there are caveats to the scheme and inclusion/exclusion eligibility criteria. Flood Re also represents a temporary, medium-term, solution to facilitate the longer-term transition to risk-reflective pricing in 2039. There is still considerable uncertainty about how this transition may be supported and the appropriateness of different mechanisms to promote behavioural change and encourage the uptake of property-level measures (e.g. through insurance incentives, changes to building regulations, government grant schemes; Oakley, 2018). Thus, Flood Re in itself, is not a panacea.

From a distributive perspective, it is has long been recognised that FCERM creates 'winners and losers' (Penning-Rowsell and Pardoe, 2012). Previous sections have highlighted a significant 'adaptation gap' in funding, which has left communities such as Fairbourne in a state

of limbo (Section 4.2.2; Box 4.1). Moreover, the current funding formula favours the protection of people and property (and thus defence-based approaches) over adaptive-based measures; in this regard, communities do not have equal access to FCERM funding.

There is also a need to be mindful of the implications associated with Managed Realignment and No Active Intervention policies outlined in SMP2, which may result in property blight and other impacts (e.g. to health) that may seriously limit peoples' abilities 'to fulfil their potential', as this well-being goal demands. In Fairbourne, for example, residents will be required to relocate, which could lead in inequalities as '*some people have more (financial) resources and have more freedom to move*' than others (FMF, 2018: 20: see Box 4.1). However, there is also an awareness that homeowners may feel disadvantaged compared to those in social housing - "*to some extent they will have their considerations managed for them and because they don't have their own assets locked-into Fairbourne they will be better supported than the people who are owner occupiers*" (JBA). Equitability is therefore outlined as an explicit objective of the Fairbourne Moving Forward "Masterplan" and the *Fairbourne Framework for the Future* (FMF, 2018; 2019). Furthermore, there is an inter-generational dimension to adaptation discussions that is often overlooked – "*there were lots of people who would have bought a house there as a retirement home, taken their life savings putting it into there and that would have been their inheritance for the kids. All of a sudden that was totally wiped out*" (PCC).

Although flood and coastal erosion risks are inherently unequal and indiscriminate, and SMP policies are defensible in the context of sustainability, it is still vital that the social inequalities that result from this are acknowledged. Acknowledgement should be a key step within community engagement and efforts made to mitigate these as far as possible, with communities themselves given an active voice in decision-making. Within this, it is also vital to recognise that perceptions of injustice are just as pertinent and play a key role in shaping relationships between the public and professional stakeholders, levels of trust and views on legitimacy (Alexander et al., 2017). Community engagement processes are therefore essential for navigating these concerns and supporting procedural fairness, but this is dependent on engaging widely with communities to ensure that all views are represented to enable deliberative democracy.

> "[It's important to ensure] everyone, whatever their circumstances…that they understand to an equal extent and are able to contribute to an equal extent, because they are all, each individual, they all have effectively an equal stake in the future of the community" (JBA)

The design and implementation of adaptation strategies should be mindful of equality-justice debates. This was evident in discussions with Gwynedd Council and the proposed buy-to-let scheme, where it was debated under what capacity the purchased properties might be let, with a suggestion that they might be used to address homelessness and social housing needs. As illustrated in the quote below, 'fairness' needs to be considered from multiple angles, both from

a community perspective and from the perspective of those potentially moving into an area subject to future policy change.

> "It solves the financial problems, but I said you can't be putting people that already have chaotic and challenging lives in a situation where they're going to get flooded. Firstly I said that's *not fair*, I said secondly it's not acceptable to put somebody who's homeless and hoping to get themselves back [on] their feet … in a place where there's limited employment opportunities and limited transportation there because it's very low on … connectivity and access to services .. but also … with Fairbourne being largely populated by people that are 55/60 plus, I said I'm not too sure it's very fair on them and I said one of the guarantees that we gave the community is that anything that we did would have a minimum impact on the existing residents that chose to remain in Fairbourne" (Gwynedd Council)

During flood incidents themselves, it is recognised that certain individuals may be more vulnerable than others (e.g. elderly, young children, low income etc.). This is successfully addressed in FCERM through various mechanisms, such as the use of flood wardens and community flood plans, as well as established protocols within emergency management (NRW, 2010; Welsh Government, 2016d). In this context, there is an equitable approach in FCERM.

However longer-term, climate change raises additional equality-justice debates. This is further reinforced by the Committee on Climate Change, who cite low income groups as the most susceptible to climate change impacts in terms of capacity and resources to adapt (Street et al., 2016). Welsh Government have further acknowledged that climate change '*will disproportionately affect the most vulnerable communities in Wales*' (Welsh Government, 2019b: 11). To help address this in the decarbonisation agenda, a Climate Just advisory group has been proposed as a mechanism for advising Government and will be comprised of a range of sectoral representatives as well as 'the citizen' (Welsh Government, 2019b). Similar arrangements have been implemented in Scotland with the formation of the Just Transition Commission, which advises Scottish Ministers on justice matters related to a net-zero economy transition[73]. In both instances, concepts of justice are discussed in the context of climate change mitigation, as opposed to adaptation.

The notion of 'just transitions' or 'just transformations' (Bennett et al., 2019) has expanded within the academic literature, particularly in relation to climate change mitigation and low carbon economies (Newell and Mulvaney, 2013; Heffron and McCauley, 2018; O'Riordan et al., 2019; Markkanen and Anger-Kraavi, 2019; McCauley et al., 2019). This growing body of research draws attention to the inequalities that are created or reinforced through policy change, and emphasises the importance of inclusive processes (involving all types of stakeholders) in order to navigate transitions in a socially just way (Heffron and McCauley,

[73] https://www.gov.scot/groups/just-transition-commission/

2018). While the concept has gained traction in climate change mitigation, there is a risk that climate change adaptation becomes overlooked. Justice debates in FCERM have not been directly addressed in previous inquiries (Auditor General for Wales, 2016; Public Accounts Committee, 2017), nor is the concept of justice included in the revised National FCERM Strategy; in fact, coastal adaptation is defined with no acknowledgement of justice concerns - *"[T]he process of adjustment due to actual or expected climate change. Adaptation seeks to moderate or avoid harm to communities*" (Welsh Government, 2019a:50). Even within the definition of 'an equal Wales', the concept is noticeably absent.

However, it is vital that the principles of justice are embedded within adaptation debates if an equitable approach is to be assured. This could be a potential matter for the Flood and Coastal Erosion Committee to address and discuss whether a distinct Flood Just group is required, or whether there is scope to broaden the remit of the proposed Climate Just group beyond decarbonisation matters, to also embrace adaptation concerns more widely.

Key learning points:

Funding allocations are predominantly determined according to levels of risk and heavily weighted by the Communities at Risk Register to ensure a fair approach. However, there are sources of injustices that are created and reinforced through the current funding formula, which disadvantages adaptive-based schemes. As a result, communities do not have equal access to FCERM funding.

Acknowledging the potential (and perceived) inequalities that result from shoreline management policies should be a key step within community engagement and efforts made to mitigate these as far as possible, with communities themselves given an active voice in decision-making and deliberation. Likewise, the design and implementation of strategies for delivering Managed Realignment and No Active Intervention should be mindful of equality-justice debates.

It is accepted that sustainable FCERM will require the relocation of certain communities away from the coast; however, 'just transitions' are vital. There is a need to better embed the principles of justice within adaptation discourse in FCERM. It is recommended that the Flood and Coastal Erosion Committee consider the issue of 'just transitions' and potential pathways through which ongoing scrutiny might be provided, such as the creation of a Flood Just group or opportunity to integrate adaptation matters within the proposed Climate Just advisory group. Communities themselves should be at the heart of these discussions.

5.2.5. A Wales of cohesive communities

Attractive, viable, safe and well-connected communities.

Cohesive communities is broadly defined in the *Well-being of Future Generations (Wales) Act 2015* to include issues of attractiveness, viability, safety and connectivity. The concept of 'safety' is rooted in the basic premise of FCERM in Wales and is ensured through a holistic risk-based approach that aims to minimise exposure, alleviate the likelihood and magnitude of these hazards, and consequences when these occur (Figure 2.4). Therefore, it is important to not simply think about safety in terms of flood prevention; indeed, the fact that floods cannot be fully prevented has long been recognised in policy.

Considerable efforts have also been made to ensure that FCERM schemes offer attractive (as well as functional) solutions. For example, the award-winning Colwyn Bay waterfront project provided additional recreational and regeneration opportunities (such as improvements to the national cycle route), while simultaneously enhancing the aesthetics of the area through landscaping and improvements to the promenade[74].

However, 'viability' remains a contentious matter in FCERM. Shoreline Management Plans specify stretches of the Welsh coastline subject to Managed Realignment and No Active Intervention policies based on a combination of environmental, economic and socio-cultural factors. In places where these policies intersect with communities, there has been a decision that maintaining the community *in situ* is no longer viable. The ramifications of this decision can be extensive. Nowhere has this issue been more debated than in Fairbourne (Gwynedd), where the community will be subject to managed realignment and 'decommissioning' in the next SMP2 epoch (Box 4.1). Significant concerns have been expressed by local residents about the impact of this decision on the 'social fabric' of the community, as a result of people deciding to sell or even abandon their properties, or potentially resulting from new people moving into the area through the proposed buy-to-let scheme (FMF, 2016). Maintaining the viability of the community until the eventual point of decommissioning remains the primary concern of Gwynedd Council.

Although there are clear challenges for implementing these difficult decisions on the coast, FCERM projects can also be a means of bringing communities together for a shared cause. This is something that is explicitly recognised in the revised National FCERM Strategy – "*Closer working with communities to discuss risk and collaborate on alleviation schemes also helps bring people together and take greater collective responsibility*" (Welsh Government, 2019a:

[74] See https://www.ice.org.uk/what-is-civil-engineering/what-do-civil-engineers-do/colwyn-bay-waterfront-phase-2

8). Community flood action groups are a good example of this (Section 4.8). Residents in Fairbourne have also reported an increased sense of place and community coherence, forged through shared challenges (FMF, 2018).

Shoreline Management Plans also have significant implications for coastal infrastructure, particularly the **rail network** which plays a vital role in connecting communities, both within Wales and across the Welsh-English border. Network Rail have only recently started to consider the longer-term implications of SMP2s on the network. The Wales Route is currently carrying out a strategic assessment in Gwynedd county of where network assets intersect with SMP2 policy change units. This followed a joint meeting in early 2019 between Network Rail, NRW and Gwynedd Council - "[*It] came about from the local MP and the leader of Gwynedd council wanted to find out a little bit more about what we were doing in terms of kind of coastal resilience*" (Network Rail). The main aim of the project is to better understand the choices that will need to be made in the future, rather than informing decision-making at this stage.

> "[I]f the [SMP2] options in one area in a hundred years is to realign the railway, we might look at that and go actually we've got various choices here, we could realign the railway, it's going to be very, very expensive. It could be in an area where actually passenger numbers are really, really low, is this what we want to do or do we want to actually close the railway and replace it with another mode of transport which isn't necessarily politically palatable but the idea is we're setting out choices which are going to need to be looked at for the future […] We will be setting out choices…because it isn't up to us to make those decisions, it's up to funders and governments to do that " (Network Rail).

This is the first time that such research has taken place and Network Rail were keen to stress that this is very much a "*learning process*". Nonetheless, this is an important step forward in terms of thinking longer-term about the resilience of the rail infrastructure under future climate change and sea level rise. Decisions about the future of key assets within Network Rail ownership have clear implications for maintaining a Wales of Cohesive Communities (even though Network Rail itself is not subject to the well-being duty). Decisions may be made to cease operations in certain areas, or roll-back where possible, which could erode connectivity between communities. Moreover, the nature of Network Rail's funding excludes enhancements to the rail network, which could also have a detrimental impact – "*we're funded as an organisation for our core activities which is operation maintenance and renewal of the railway in this five-year funding cycles. We don't have any funding for enhancing the railway above and beyond what it does today*" (Network Rail). Recognising the potential well-being implications of this and impact to other services, we understand that Network Rail were invited to be part of the Gwynedd and Anglesey Public Service Board. This is something that should be promoted more widely across other PSBs, as well as Coastal Groups, in order to promote awareness of the future threats to the existing Wales Route and corresponding implications for other vital services that maintain the viability and connectivity of Welsh communities. However, it will also be necessary to address systemic barriers to collaboration that exist within Network Rail's governance, namely, around funding remits (i.e. maintenance only) and embedding

strategic matters within the 5-yearly asset management periods. These decisions are not devolved to Wales but reside with the Department for Transport in UK Government and the Office of Rail and Road regulator[75]. Others have similarly drawn attention to the institutional challenges impeding adaptation within rail infrastructure, related to the lack of 'problem ownership' within Network Rail and the Department for Transport, and lack of clear responsibilities (and accountability) for climate change adaptation in the UK (Uyl and Russel, 2018). This warrants a higher-level debate at the UK scale.

In addition to the rail network, highways and public rights on way will also be impacted by SMP2 policies, which can have implications for maintaining well-connected communities. This has created conflict in certain locations such as Cwm Ivy, where local communities have challenged the loss of public rights of way (Box 4.4). Part of the challenge in the case of Cwm Ivy was that the breach naturally occurred and somewhat forced a reactive discussion of managed realignment. As discussed in Section 4.3.5, it is vital that competent authorities *proactively* engage communities (including user communities) in places where future policy change is specified, in order to raise awareness of coastal change issues early on and collectively shape a vision for the future.

Key learning points:

Safety in FCERM is not simply about defending against flooding, but is supported through a diversified, risk-based approach which aims to minimise exposure to risks, alleviate the likelihood/magnitude of hazards, and alleviate the consequences when these occur. The strengths and weaknesses of this approach are outlined in Section 4.

FCERM policy and funding structures encourage FCERM schemes to be designed to deliver multiple benefits, including attractiveness/aesthetics amongst other well-being benefits.

Sustainable FCERM means difficult decisions need to be made about the long-term viability of certain coastal communities. It is vital that implementing Managed Realignment and No Active Intervention policies consider the impact on the character of the community and work directly with communities to navigate this transition. Whilst challenging, these discussions have the potential to help forge community cohesion and sense of shared ownership.

Shoreline Management Plans also have significant implications for coastal infrastructure, particularly the rail network which plays a vital role in connecting communities. Network Rail have only recently started to consider the longer-term implications of SMP2s on the network.

[75] https://orr.gov.uk/

This needs to take place across the Wales Route and Network Rail need to be more actively involved in Coastal Groups and Public Service Boards. In order to facilitate adaptation and future collaboration, broader debates need to take place at the national scale to address the remit of Network Rail funding and how strategic concerns may be better embedded in the 5-yearly control periods and asset management planning.
It is vital that competent authorities *proactively* engage communities in places where future policy change is specified, in order to raise awareness of coastal change issues early on and collectively discuss visions for the future.

5.2.6. A Wales of vibrant culture and thriving language

A society that promotes and protects culture, heritage and the Welsh language, and which encourages people to participate in the arts, and sports and recreation.

Although the revised National FCERM Strategy acknowledges that culturally-significant sites are at risk of flooding or erosion, it is interesting that this is the only well-being goal that was absent from the National FCERM Strategy consultation document and one where further advice was sought from consultees (Welsh Government, 2019a). This suggests that not all well-being goals are currently being equally considered in policy, as required. It also reflects the observations from the stakeholder workshop, where this goal was identified as the poorest 'fit' and least well-addressed well-being goal in FCERM (see Section 5.1). Interestingly, mixed views were expressed amongst interviewees and workshop participants about whether enhancing language and cultural heritage goes beyond the remit of FCERM, with some asserting that legislation requires public bodies to demonstrate consideration only, as opposed to action on the ground.

However, certain aspects of this goal are deemed more relevant and achievable than others. For instance, there was consensus amongst interviewees that FCERM schemes have considerable potential to support **recreation**, whether by increasing access to nature through nature-based approaches or through schemes that actively aim to deliver recreational and sports facilities as part of a multi-beneficial approach such as Colwyn Bay (Welsh Government, 2019a). However, other aspects of this goal (as defined in the legislation) appear to be more removed from FCERM thinking. Although all risk communication is available in the Welsh language and outreach initiatives are evident (e.g. educational outreach), these are not explicitly highlighted in the revised National FCERM Strategy. Furthermore, the decision to exclude this well-being goal from the consultation of the FCERM Strategy indicates uncertainty on Welsh Government's behalf about how to fully address this goal. Although the strategy remains in the consultation phase and is still subject to change, this observation is highly relevant, given that other RMAs must act in consistency with the National Strategy.

Based on our research, we feel that this is a considerable weakness and demonstrates unequal consideration of the well-being goals. This is more than a 'tick box' exercise but an opportunity to celebrate the various ways in which FCERM can contribute more widely to achieving the well-being of future generations and crucially highlighting opportunities for cross-sectoral working to those within and outside the FCERM community. There is a need to think creatively about how FCERM activities might help support and enhance **Welsh language skills**, such as multi-lingual outdoor in-situ education platforms to explain new schemes, or linking to education programmes more widely (as discussed in Section 5.2.1). This approach would be well-aligned with Welsh Government's Low Carbon Strategy, where education is identified as a valuable lever for involving young people in climate change discussions (Welsh Government, 2019b).

Another pathway may be through efforts to **build community resilience**. This is a key objective within the National FCERM Strategy and is referred to in the context of improving preparedness, awareness and understanding of practical actions to take (Welsh Government, 2019a: 37). However, research has shown that cohesive communities with high social capital can be more resilient to the effects of flooding (McEwen et al., 2018; Ntontis et al., 2018; Wickes at al., 2015). In this sense, any form of community activity could have a positive effect on flood resilience. This point was also raised during the stakeholder workshop. There is a need for FCERM practitioners at the local scale to be aware of other local community initiatives and how these may be co-delivered to not only build community resilience to flooding, but more broadly strengthen the alignment between FCERM and cultural well-being.

Cultural heritage is also highly relevant for FCERM, especially along the coast where numerous heritage assets are highly vulnerable to future coastal change. The sustainable management of the historic environment also has significant implications for Prosperity and tourism in Wales, and is estimated to contribute £963m per annum to the Welsh economy (Welsh Government and Cadw, 2018). There are several key governance mechanisms that currently help bridge the historic environment with FCERM and allied policy areas. Firstly, the importance of protecting and managing national heritage is reinforced through the *Historic Environment (Wales) Act 2016*, which gives a statutory status for historic environment records[76], powers for protecting nationally important sites and the formation of statutory heritage partnership agreements. The historic environment records collate a wide range of information on historic assets[77], conflict sites, historic landscapes and character, World

[76] Welsh Ministers must compile and keep up to date a historic environment record for each local authority area in Wales, under Sections 35 and 36 of the *Historic Environment (Wales) Act 2016*. These duties have been discharged to the four Archeological Trusts in Wales, who each maintain a regional historic environment record.
[77] This refers to historic assets that have statutory protection or are registered under the *Planning (Listed Buildings and Conservation Areas) Act 1990* or the *Ancient Monuments and Archaeological Areas Act 1979*.

Heritage Sites, other sites of historic, archaeological or architectural interest, and historic place names. The public bodies named in the Act are expected to take account of these records and use these as a key evidence base for a range of activities (see Welsh Government and Cadw, 2017c)[78] - including strategic policies and plans (e.g. well-being plans and area statements), as well as local development plans and determining planning applications (see TAN 24, Welsh Government, 2017l[79]). Moreover, named public bodies are expected to use the historic environment records '*as a key source of evidence when considering adaptive responses to the impact of climate change'* (Welsh Government and Cadw, 2017c). Therefore, the historic environment record functions as a resource-based bridging mechanism.

In addition, best practice guidance is available through Welsh Government's historic environment service, Cadw (e.g. Welsh Government and Cadw, 2017a; 2017b). Planning policy further requires local development plans to reflect national policies for the conservation and enhancement of the historic environment (Welsh Assembly Government and Cadw, 2011[80]; Welsh Government, 2018c). External to spatial planning, other governance mechanisms support integration between FCERM and the historic environment. For instance, the National Trust's *Shifting Shores* policy adopts a sustainable and pragmatic approach that embraces coastal change and, rather than seeking to defend assets at all costs, aims to document key information before it is lost (National Trust, 2015). National Trust representatives are also members of the Wales Coastal Groups Forum and sometimes sit on Coastal Groups to maintain awareness of SMP2 policies. Another useful bridging mechanism is the Memorandum of Understanding (MoU) between NRW and the 4 Welsh Archaeological Trusts, which demonstrates a commitment to collaboration and joint working across the historic and natural environment (NRW and Welsh Archaeological Trust, 2016). Areas of overlapping interests include Local Development Plans, area-based natural resource management plans, the impacts of the FCERM capital/maintenance programmes, NHCP and habitat restoration on historic assets, as well as SMPs. The MoU further specifies the intention to look for joint opportunities, such as joint applications for funding specific projects (e.g. improving public access to historic sites in coastal locations). Finally, interdisciplinary research initiatives, namely the CHERISH project, are also playing an important role in documenting coastal

[78] The historic environment records are also expected to inform conservation and management projects; (re)naming places; heritage-led regeneration; cultural tourism and economic development; education and social inclusion; public participation in the exploration, appreciation and enjoyment of local heritage; and advancing knowledge and understanding.

[79] The Welsh archaeological trusts use the information held in the historic environment records to provide advice to local planning authorities on the preparation of local development plans and development management.

[80] These principles emphasise the need to manage historic assets to sustain their value, understanding their significance, seeing the historic environment as a shared resource, ensuring participation, as well as transparent and reasonable decisions where changes are required (Welsh Assembly Government and Cadw, 2011).

heritage, understanding socio-cultural histories and historic environmental change, before key sites succumb to sea level rise and erosion (see http://www.cherishproject.eu/en/).
Climate change is explicitly recognised as a challenge for the management of the historic environment (Welsh Assembly Government and Cadw, 2011; Historic Environment Group Climate Change sub-group, 2013; Welsh Government and Cadw, 2018). Moreover, a key priority of Cadw is to facilitate the integration of heritage within policy development and delivery, noting that "*it is all too easy for heritage to be an afterthought if not firmly embedded within the 'mainstream' of policy development and delivery*" (Welsh Government and Cadw, 2018: 14). However, despite the range of bridging mechanisms detailed above, the relationship between FCERM and the historic environment is poorly articulated in the latest National FCERM Strategy, as well as interviewees, and one that should be strengthened at a strategic level. In order to ensure the sustainable management and preservation of cultural heritage in the face of climate change and sea level rise, there is a need to not only maintain such bridging mechanisms but further strengthen the alignment between the historic environment and FCERM communities.

More widely, forging a closer relationship between this well-being goal and FCERM could potentially help to unlock alternative sources of funding, by linking FCERM schemes to other objectives. Examples include the Arts and Environment Grant Fund (via the Millennium Stadium Charitable Trust), the Postcode Community Trust, the National Lottery Community Fund (people and places theme) and Heritage Lottery funding (see NRW, 2019).

Key learning points:

Culture and Welsh language do not appear to be given the same consideration within FCERM as other well-being goals, yet there are numerous ways in which FCERM is already, or has the potential, to support this goal. There is a need to think creatively about how FCERM activities might help support and enhance Welsh language skills (e.g. through education pathways), and link to local community initiatives, which may simultaneously help to foster social capital and indirectly support community resilience to flooding.

In order to ensure the sustainable management and preservation of cultural heritage in the face of coastal change, there is a need to strengthen alignment between the historic environment and FCERM communities. In the first instance, the relationship between the two should be more strongly articulated within the National Strategy for FCERM to provide a strategic steer for action on the ground.

5.2.7. A Wales that is globally responsible

A nation which, when doing anything to improve the economic, social, environmental and cultural well-being of Wales, takes account of whether doing such a thing may make a positive contribution to global well-being.

In an effort to combat future climate change and reduce climate-related risks, international efforts are being made to curb global temperature rise to below 2°C, and ideally 1.5°C above pre-industrial levels, under the Paris Agreement[81] and the Under2 Coalition[82] to which Welsh Government was a founding signatory. However, the latest report by the Intergovernmental Panel on Climate Change (IPCC) has asserted the need for accelerated action and transformative changes in governance in order to limit warning to the 1.5°C threshold (IPCC, 2018). In April 2019, the Welsh Government declared a **climate emergency** and ambition for a carbon neutral public sector by 2030[83], as well as publishing a low carbon strategy (Welsh Government, 2019b). However, even if climate mitigation is able to successfully limit warning to 1.5°C, sea level rise is set to continue beyond 2100; thus, adaptation is equally essential.

There are numerous ways through which FCERM supports (or has the potential to better support) both climate change mitigation and adaptation – albeit, this is somewhat under-represented within the revised National FCERM Strategy, which focuses purely on "*supporting sustainable approaches such as Natural Flood Management and hybrid schemes to help reduce flood and coastal erosion risk*"(Welsh Government, 2019a: 8), as opposed to recognising its role in climate mitigation and adaptation more widely. Although the framing of FCERM arguably needs to be broadened (as discussed in Section 4.1), there are several governance mechanisms in FCERM that actively contribute to the Global Responsibility of Wales.

The policy towards NFM for instance, is incentivised through funding mechanisms with the FCERM Business Case Guidance (FCERM-BCG) specifying that NFM solutions be short-listed (Welsh Government, 2019c). Such approaches provide a much needed home for nature and help to alleviate declining trends in biodiversity identified in the State of Natural Resources report (NRW, 2016a), maintain the integrity of the Natura 2000 network and support the Nature Recovery Action Plan to deliver commitments to the EU Biodiversity Strategy and UN Convention on Biological Diversity (Welsh Government, 2015c). Nature-based approaches in FCERM also provide a number of regulating ecosystem services such as nutrient cycling,

[81] The Paris Agreement entered into force on the 4th November 2016 and has been ratified by 185 parties.
[82] The Under2 coalition unites 220 State and Regional Governments under a shared commitment to limit global temperature rise below 2 degrees.
[83] See https://gov.wales/welsh-government-makes-climate-emergency-declaration

improved water quality and carbon sequestration (Beaumont et al., 2014; Temmerman et al., 2013; Erwin, 2009). For example, Jickells et al. (2000) found that managed realignment and associated creation or restoration of saltmarsh habitat in the Humber lead to enhanced nutrient cycling and sedimentation of saltmarshes or mudflats. Moreover, in the context of climate change mitigation, the role of carbon sequestration provided by coastal wetlands, such as saltmarshes, is considered increasingly important. Understanding the carbon storage capacity of saltmarshes, and the potential to enhance this through restoration and wetland creation projects, such as those supported by NFM, is one of the primary areas of research in the Defra Marine Pioneer natural capital assessment work (see, for example, Holt, 2019). Indeed, a study by Andrews et al. (2008) calculated the net effect of restoring 26km^2 of intertidal habitat in the Humber estuary, amounting to the storage of 40,000 tonnes per year of sediment and resulting sink of ca. 800 tonnes per year of carbon (see EA, 2017). Amongst interviewees, the value of carbon sequestration was particularly recognised, especially within the National Habitat creation Programme – "*it provides an opportunity to support that which otherwise will become in deficit and it also provides an opportunity to put yourself into credit in the medium to long term with respect to carbon sequestration*" (NRW).

The shift towards nature-based approaches and hybrid schemes is a positive step forward in the revised National FCERM Strategy, and has clear links to each of the 7 well-being goals, particularly Resilience and Global Responsibility. However, the successful delivery of such initiatives is **constrained by several factors** that have been highlighted in other sections of this report, these included:

- The non-statutory status of SMPs and weak duties to consider or have regard to them in other aspects of public policy;
- General lack of awareness of SMP2 and implications for coastal assets and services;
- Gaps in funding;
- Legislative rigidity and duties to maintain Public Rights of Way;
- Challenges negotiating across multiple landowners, with different priorities, remits of responsibility and planning (and funding) horizons;
- Reputational risks;
- Knowledge gaps in quantifying other ecosystem services provided by nature-based approaches, which may undermine the business case;

Addressing these will be essential to better bridge FCERM and its contribution to a Global Responsible Wales, as well as international commitments (e.g. Convention on Biological Diversity, UN Sustainable Development Goals and International Memorandum of Understanding on Nature Based Climate Action).

5.3. Opportunities and challenges for delivering the Five Ways of Working

In accordance with the sustainable development principle, the *Well-being of Future Generations (Wales) Act 2015* outlines 5 key ways of working (Figure 2.2). These include adopting a long-term perspective, taking a preventative, integrated and collaborative approach, and promoting stakeholder involvement. Drawing from Section 4 and Section 5, Table 5.1 summarises the ways in which current FCERM governance facilitates or constrains the ability to deliver these 5 ways of working.

Table 5.1: Overview of strengths and weaknesses in FCERM according to the Five Ways of Working

5 ways of working	Strengths	Weaknesses
Long-term	• SMP2 provide a long-term strategic vision for the coast and informed by scientific evidence on future sea level rise; • Coastal Groups play a key role in coastal governance to promote long-term thinking; • PSBs must take account of the Climate Change Risk Assessment in performing well-being assessments; • Climate change allowances must be considered over the lifetime of proposed developments (via flood consequence assessment), following CL-03-16. These will be included in a Wales Flood Map to inform spatial planning decisions. • Some good examples of adaptation strategies that adopt a long planning horizon to navigate future change (e.g. *Fairbourne's Framework for the Future*); • Statutory requirements to monitor the State of Natural Resources and Future Trends;	• The decarbonisation agenda appears to be prioritised over climate change adaptation at a governmental level (as evident in the staffing levels in these departments and dominant discourse towards decarbonisation seen in national policy e.g. Prosperity for All polices[84]); • Adaptation is not an explicit objective in the revised National FCERM Strategy. Welsh Government criticised for lacking a sense of urgency to address adaptation challenges; • The duty of PSBs to 'take account' of the UK Climate Change Risk Assessment lacks strength; • There is a need to increase efforts towards proactive adaptation in FCERM and early engagement with coastal communities in particular where policies changes are expected in future SMP2 epochs; • There is still a tendency towards defences and hybrid approaches and need to be cautious about the 'sunk costs' and lock-ins that this may create; • The 'adaptation gap' created through FCERM funding criteria and budget silos is a barrier to implementing adaptation schemes; • Lack of governance mechanisms or policy instruments to enable adaptation; • Legislative rigidity needs to be addressed where it comes into conflict with adaptation initiatives (particularly *Highways Act 1980* and duties to maintain Public Rights of Way); • Need to raise awareness of SMP2 with stakeholders and the public; • Long-term within Network Rail in embryonic stages; • Need to acknowledge and embed principles of justice and 'just transitions';

[84] For example, Prosperity for All: A low carbon Wales states "*Although we will be looking to build resilience in Wales through our Climate Change Adaptation Plan, which will be published later this year, it is even more important to reduce our emissions to protect our own well-being and to demonstrate our global responsibility*" (Welsh Government, 2019b: 11).

5 ways of working	Strengths	Weaknesses
		• Within the Five Ways of Working, a 'long-term' perspective is recommended as 25 years (Welsh Government, 2016i), however, the implementation of SMP2 policy change (particularly where this change will directly impact local communities) will require longer planning horizons.
Prevention	• Long-term acceptance within FCERM policy that floods cannot be fully prevented but that a risk-based, holistic approach is required to help prevent floods and their impacts from worsening; • Medium-term capital commitments of funding via FCERM programme and CRMP; • FCERM funding is directed towards areas most at-risk via the Communities at Risk Register; • Welsh Government commitment to *mitigate* climate change, with declaration of a 'climate emergency' in 2019 and commitment to a carbon neutral public sector in 2030; • The planning system aims to avoid the creation of problems for the future, with safeguards in place to minimise inappropriate development; • The NHCP aims to offset the effects of FCERM works and coastal squeeze to establish compensatory habitat; • Experimental powers under the *Environment (Wales) Act 2016* to trial new approaches; • New requirements for SuDS approval for future developments to prevent surface water risks from worsening;	• A long-term commitment to revenue funding is needed to support a wider range of FCERM activities; • Barriers to implementing the NHCP must be addressed in order to keep pace with sea level rise – related to working with multiple landowners (with different priorities, planning horizons and remits of responsibility); navigating legal duties to maintain public rights of way and duties of care; reputational risks; and lack of awareness of the implications of SMP2; • Coastal adaptation is essential to prevent problems from worsening in the future, yet there are significant challenges to implementing adaptation schemes – including a lack of governance mechanisms, strategic support and guidance, and gaps in funding. • Proactive, meaningful and sustained engagement (not consultation) with coastal communities is needed, alongside appropriate resourcing to support RMAs; • Need for research into mechanisms for incentivising and supporting the uptake of property-level measures at household scale;
Integration & collaboration	• Statutory requirement to demonstrate the Five Ways of Working, sustainable development principle and contribution to national well-being goals (i.e. legal impetus for new ways of working); • Strong desire for integration and collaboration within the FCERM community, and wide recognition that no one organisation can deliver this alone; • Partnership working is increasingly seen as a foundation for effective FCERM, with numerous schemes developed under partnership arrangements; • PSBs have considerable potential to facilitate integration; • Area Statements have the potential to 'bridge' activities across public authorities; • Integration of ecosystem resilience into public body working via Section 6 Duty of *Environment (Wales) Act 2016*; • Integration between spatial planning and marine management is supported through	• Conflicting planning horizons can hamper opportunities to collaborate and integrate activities; • There remains a tendency towards budget silos; • Continued tendency towards operational and specialist silos; • Consideration of FCERM by PSBs is *ad hoc*; • PSBs are not fulfilling their potential when it comes to connecting FCERM with other local initiatives. There is a need to increase awareness of the wide range of well-being benefits attached to FCERM activities, both within the FCERM community and beyond; • For partnerships to develop and be successful, there is a need to enhance understanding of '*the other'* and increase awareness of the remits/constraints that other actors are working within. Secondments and joint work placements could support this. • Different spatial scales ('spatial footprints') of planning documents – catchments, areas, PSBs etc. can make integration difficult; • Resources (especially time) are required for collaboration, yet these are severely lacking;

5 ways of working	Strengths	Weaknesses
	legislated duties – e.g. the National Development Framework must explain how it has taken into account relevant policies set out in any marine plan adopted and published by them under Part 3 of the *Marine and Coastal Access Act 2009*; • Requirements in spatial planning (e.g. strategic flood risk assessments and LDPs) to have regard to local well-being plans, SMP2 and FCERM Strategy;	• Creating a common goal is key – e.g. "*We haven't necessarily got to the point where we've got a common shared goal for a particular place* (NRW); and "*unified understanding of the implications of coastal change*" (National Trust. • Need to understand/establish mechanisms for incentivising wider financial contributions to FCERM schemes, including private sector; • Opportunities for wider benefits are included in FCERM funding criteria but this forms the smallest contribution to the final score, alongside difficulties quantifying certain benefits means these can be undervalued; • Opportunities to better integrate FCERM with preventative health care initiatives; • Links to culture and language comparatively weak in FCERM compared to other well-being goals; • Need to strengthen integration of activities across the land-sea interface;
Involvement *(with a focus on the public)*	• There are clear statutory requirements around consultation process in public policy; • Examples where adaptation strategies have devolved decision-making to local communities e.g. Fairbourne: A Framework for the Future (FMF, 2019); • Research commissioned to advance learning around stakeholder engagement (e.g. JBA Consulting and Icarus, 2016; NFF and CEP, 2018; Kelly and Kelly, 2019). • Concept of 'placemaking' in Planning Policy Wales emphasises inclusivity; • Considerable efforts have been within the FCERM community to support the education of children and young adults to enhance risk awareness.	• Traditional forms of consultation are ineffective – *meaningful engagement* is required to include local communities in 'adaptive' place-making; • Shortfall in revenue funding impacts capacity to deliver community engagement; • The media can create and exacerbate tensions between local communities and public authorities. Relationship building is essential; • Research has highlighted the need for engagement *processes*, whereas the nature of FCERM projects typically lend themselves to limited forms of consultation; • Training and capacity building would be required to implement alternative forms of engagement;

5.4. A Journey Check on FCERM

Section 5 has highlighted the number of ways in which the national well-being goals of Wales are currently delivered, or have the *potential* to be delivered, through FCERM activities. However, despite the considerable array of opportunities presented, a number of barriers remain, which mean that FCERM is not currently maximising its contribution to each of the national well-being goals.

The Future Generations Commissioner has produced a set of '**Journey Checkers'** in collaboration with key organisations, which represent each of the well-being goals and

'involvement' (as one of the Five Ways of Working)[85]. These documents are intended to demonstrate different possibilities for public bodies, as well as providing a tool for the Future Generations Commissioner to monitor progress. Each Journey Checker gives examples of changes that can be made – from *Making small changes* (quick and easy to implement), to *Being more adventurous* (beyond 'business as usual' and well-managed risk-taking) and *Leading the way* (transformational changes, such as significant reallocations or pooling of resources and innovative approaches). Examples of these are outlined in Table 5.2. In addition, the Journey Checkers describe so-called 'enablers' and 'disablers', which impact the ability to achieve the well-being goals (see Table 5.3). Using these as inspiration, this section considers where FCERM is currently situated in this journey.

Table 5.2: Examples of simple, adventurous and leading changes relevant for FCERM (sampled across Journey Checkers)

	Description	Examples
Making simple changes	Low risk and low-cost changes that are quick and easy to implement. 'Low hanging fruits' or 'quick wins'. This refers to changes that can be made internally within a single organisation, such as establishing new collaborations between departments.	• Raising awareness e.g. schools; • Provide training on climate change and empower others to learn how we can mitigate against it though personal choices;
Being more adventurous	Moving away from 'business as usual' and taking well-managed risks to establish a culture of ambition. Moving away from a single organisation focus, to supporting change in other organisations.	• Working with (community) climate change champions; • Implementing Natural Flood Management; • Sustainable urban drainage systems; • Supporting staff and communities to take part in voluntary activities for global responsibility;
Leading the Way	Transformational change to the way things are done. New collaborations are established across organisations and sectors, across a larger portfolio to achieve the future vision for Wales.	• Multiple organisations working proactively at landscape scale to resolve local challenges; • Habitat restoration to reduce flooding • Effective flood response/multi-agency plans; • Payments for ecosystem services; • Avoiding development in flood risk areas; • Involvement is a core activity, with ongoing dialogue being highly visible throughout organisational and partnership planning; • A clear demonstration of how public input has shaped the decision making and planning process throughout.

[85] The Journey Checkers were subject to consultation in January 2019 and represent 'living documents'. See Available from https://futuregenerations.wales/news/we-want-your-views-on-the-journey-to-the-wales-of-the-possible%E2%80%AF/

Table 5.3: Examples of Enablers and Disablers to achieving the well-being goals (sampled across Journey Checkers)

Enablers	Disablers
• When we see action at scale and pace required to combat loss of biodiversity; • Recognising value of green infrastructure; • Access to nature; • Raising awareness (public and political); • Working with Environment Act and principles of SMNR; • Businesses are asked to report on wider impacts; • Low carbon approaches become mainstreamed; • There is a focus on what matters to people, and this influences the delivery of services; • Shift to community-based models; • The third sector are valued for their strategic and operational importance; • An appreciation that creating a more equal wales with due regard and resource has a positive impact on the number of the other well-being goals; • Public bodies embed 'what matters' to people into their work; • There are community anchor organisations which give a voice to local people, hold assets and build resilience; • There is an understanding of the potential of creativity to support change in policy making and broader society; • Legacy projects show the long-term impact of investment on culture and language; • Strong support from civil society for actions that have a positive global impact; • Importance of global actions appreciated – not seen as nice to do add-on to business as normal; • Organisations enable the space, time and resource for meaningful involvement; • Citizens understand the relevance of their involvement.	• Prioritisation of economic growth; • Lack of cultural change – and risk aversion; • Failure to plan and manage for green infrastructure; • Lack of understanding of the value of nature; • One well-being goal is prioritised over another; • Short-term thinking; • Perception that economic growth is purely about GDP or GVA; • Organisations working in silos; • Natural resources are commercialised; • Lack of understanding on wider determinants of health; • Narrative about health only focuses on NHS; • Health is not seen as part of all policies and decisions; • Reactive approaches and solutions are prioritised; • There not an understanding of the concept of privilege; • Public bodies work in silos and don't take 'place-based' approach to what matters to people • Fragmented funding; • There is talk about involvement and coproduction but no investment in doing it properly; • Contribution to culture and language is not understood or valued; • Short-term funding/time-limited projects, minimising opportunity for lasting impacts; • Culture and language activities take place in silos; • A wales first view and lack of understanding of relevance of UN sustainable development goals to Wales; • Organisations do not invest in skills and allow time to involve people; • Organisations take traditional 'consultation' approaches to involvement.

On this journey, FCERM is situated somewhere in the middle - demonstrating efforts to be more adventurous and moving away from business as usual, such as implementing NFM and exploring opportunities for collaboration both between and beyond Risk Management Authorities. There have also been some efforts to steer transformative change in FCERM, particularly in terms of multi-agency emergency response for example, as well as strengthening the alignment between FCERM and spatial planning with the proposed changes to Tan 15 (see Section 4.5). New bridging mechanisms such Area Statements may also support landscape-scale approaches and foster greater collaboration across policy sectors. However, in order for FCERM to be viewed as a *Leader* the current gaps and barriers to effective governance identified throughout this report must be addressed.

However, this is not simply a matter for FCERM. This journey will require much wider shifts in governance, spanning across the public sector and altering the relationship between public, private and third sector actors, and civil society more widely. Change must come within, and outside, the FCERM community. This will require efforts to increase awareness of the cross-cutting benefits that can be delivered through FCERM activities - both *within* the FCERM community and *between* the FCERM community and wider policy sectors, including actors not traditionally involved in FCERM. This challenge was further discussed by some interviewees; for instance, one interviewee remarked "*everyone really is thinking right we really need to reach out to people but I'm not too sure that the same is recognised in the other direction. I don't know whether certain sectors like recreation and tourism will go 'oh we really need to speak to flood risk management and the people involved in that area of work"* (NRW). Effective 'push' and 'pull' messaging are essentially required to facilitate collaboration.

Other barriers, or 'disablers' must also be overcome. Looking to Table 5.3, this report has highlighted evidence of siloed-working, short-term funding, a seeming lack of urgency and lack of mechanisms to support proactive adaptation to future coastal change, alongside limited views on health and culture in FCERM. In particular, the most common barriers discussed by interviewees pertained to *resource constraints* (including resources for initiating and maintaining collaborations) and *risk aversion*. The latter is something that is well-documented in the public sector. To address this, several interviewees emphasised the importance of 'learning by doing', creating spaces for innovation (and even failure) and investing in well-managed risk-taking. More broadly, there is a strong case for re-framing FCERM – not simply as a matter for protection, but as part of a wider societal adaptation challenge. However, the lack of governance mechanisms and policy instruments for implementing adaptation will need to be rectified.

The *Well-being of Future Generations (Wales) Act 2015* offers an opportunity to re-think the way in which flood and coastal erosion risks are managed in the future and unlock new ways of working. However, at this point in time, there does not appear to be equal consideration of the national well-being goals within the National FCERM Strategy. Moreover, there appears to be some uncertainty about what level of contribution FCERM should make. Whilst the *Well-being of Future Generations (Wales) Act 2015* itself does not define the level of contribution that should be made, there is a clear expectation that this contribution should strive to maximise achievement of the well-being goals (with recognition that public bodies are best placed to determine this; Welsh Government, 2016i). The statutory guidance challenges public bodies to understand their potential contribution and consider what more they can do, or do differently, to maximise this. Within FCERM there are examples across all but the Resilience goal, where potential contributions are overlooked or under-valued, or constrained in some way. In the next section we identify key recommendations for addressing these in order to maximise the contribution of FCERM to national well-being. Leadership from Welsh Government will be

essential for setting the direction and expectations for action, while creating the right enabling environment for change.

However, it is important to celebrate the considerable capacity for change in Wales that became very evident during the interview process and was highlighted as a cross-cutting strength. In part, this is supported by the small size of the country, which has created a tight-knit community of policy-makers and practitioners in FCERM. This was widely reflected on across all stakeholders, who felt that this enabled collaboration and opportunities to share ideas and best practices, and stimulate change. There is also an evident desire and shared commitment to 'do things differently' and work as one, which should be commended. At the same time, it is important to recognise that change takes time and there is a collective learning process associated with the enactment of the Well-being Act.

6 Key recommendations for policy and practice

Throughout this report we have highlighted key learning points. Bringing these together, this section summarises the key recommendations for policy, practice and future research moving forwards.

Table 6.1: Recommendations moving forwards

Recommendations
Strategic matters
1. There is a need for urgent action in the current climate emergency - Welsh Government should strengthen its strategic policy around coastal adaptation and display a greater sense of urgency when developing and implementing adaptation planning. Longer-term adaptation should be better embedded within the risk-based paradigm of FCERM, forming an explicit objective within the revised National Strategy for FCERM in Wales, alongside specific adaptation-based measures to provide greater clarity to all stakeholders (including the public) about the future. Longer-term ambitions should be clearly stated. 2. Reframing problems and solutions – FCERM should be understood as a key component of climate change adaptation and seen as part of a wider social, economic and environmental challenge that demands a diversified approach, in addition to protective measures. Moreover, climate change adaptation should be given the same level of priority within Welsh Government as climate change mitigation and decarbonisation goals. 3. There is a current lack of clarity in how Welsh Government understands and expresses the contribution of FCERM to the Welsh well-being goals. Stronger leadership from Welsh Government is essential if it is to maximise its strategic steering capacity. Welsh Government should specify well-being objectives within the National FCERM Strategy and consider specific measures for monitoring progress against these.

Recommendations
Funding
4. Diversifying funding sources and establishing 'funding partnerships' will be essential for maintaining and enhancing FCERM and wider well-being benefits in the face of future threats. However, further research is required to better understand how this might be implemented, barriers addressed and action incentivised. 5. A boost and long-term commitment to revenue funding is required to keep pace with the rising demands facing FCERM associated with climate change. 6. The methodology for prioritising FCERM capital funding should reconsider the weighting assigned to multiple benefits to better incentivise delivery of wider well-being goals. This could conceivably vary depending on different categories of FCERM schemes. 7. There is no clear funding stream to support adaptation schemes requiring the managed realignment or decommissioning of assets, or relocation of people and property. To address the current 'adaptation gap' in funding, there is a need to re-think how funding is prioritised within the CRMP/FCERM programme, which currently favours traditional defence-based approaches and disadvantages adaptive-based schemes. This creates inequalities in the accessibility of FCERM funding that must be addressed. Moreover, efforts must be made to bridge current departmental silos and unlock opportunities for cross-department and cross-sectoral funding. 8. Further research is required to address remaining evidence gaps in quantifying the benefits of catchment/area-based approaches, Natural Flood Management and hybrid approaches, as well as the wider well-being benefits associated with FCERM schemes.
Coastal adaptation
9. Long-term funding for the Wales Coastal Monitoring Centre should be secured beyond 2022 to maintain a strategic approach to coastal monitoring, essential for supporting evidence-based decision-making and coastal adaptation planning. 10. There is a need to raise the profile of Shoreline Management Plans (SMP2) amongst a broader remit of stakeholders operating at national to local scales, in order to better embed shoreline management in strategic planning at the land-sea interface. This could be supported by efforts to diversify and motivate wider participation within Coastal Groups (e.g. Network Rail, National Trust and other relevant Local Authority departments). The Wales Coastal Groups Forum is well-placed to develop a communication strategy to explain the relevance of SMP2 to a wide range of organisations/departments and support this endeavour. 11. In order to sustain the valuable role played by Coastal Groups, and ensure regular attendance from local authority members, there is a need to investigate options for overcoming resource constraints and potential opportunities for pooling resources. 12. Coastal adaptation is seriously constrained by the absence of governance mechanisms and policy instruments, and lack of strategic leadership from Welsh Government. Further research is required into innovative governance mechanisms for enabling adaptation (e.g. looking across

Recommendations
FCERM, spatial planning, building regulations and insurance sectors for example), alongside critical questions about who should pay. 13. Adaptation is a *process* – effective frameworks (not projects) are essential for navigating this and providing a route-map for locally-driven decision-making. However, a national strategic framework through which to deliver adaptation on the ground is essential. Stronger leadership and support from Welsh Government is required in this regard. While the proposed coastal adaptation toolkit/guidance may be useful, this needs to be coproduced between Welsh Government, Coastal Groups and the Wales Coastal Groups Forum to ensure it matches the needs of those implementing adaptation at the local scale. 14. Legislative rigidity in the form of Public Rights of Way is a key barrier to implementing coastal adaptation. Aligning Public Rights of Way and Highways legislation with coastal adaptation requirements is essential. The Wales Coastal Groups Forum should directly engage the National Access Forum and proposed independent Access Reform Group, to discuss how access reforms may better support and enable coastal adaptation. 15. 'Difficult conversations' need to be taking place today. There is a moral responsibility to actively engage communities and other stakeholders now about the future of their coastline. Community engagement requires a *sustained* dialogue, supported by sufficient resources and training of staff on the ground. All RMAs and Coastal Erosion Risk Management Authorities should actively engage local communities in a consistent, honest, clear and transparent way while recognising the need for sensitive and compassionate language. 16. Communities should be placed at the heart of adaptation planning and play a key role in determining their future. Empowering local communities to become actively involved in FCERM and adaptation planning will require *meaningful engagement* (not consultation) in order to establish a shared understanding of local risks and adaptation needs, while creating space for different options for the future/adaptation pathways to be discussed. Further research is needed to explore alternative, creative approaches to diversify the engagement 'toolkit', and explore how these may be appropriately tailored to suit different place needs, as well as reflecting the vibrancy of Welsh culture and the Welsh language. 17. "Just transitions" are vital - there is a need to better embed the principles of justice within adaptation discourse in FCERM. It is recommended that the Flood and Coastal Erosion Committee consider the issue of 'just transitions' and potential pathways through which ongoing scrutiny might be provided, such as the creation of a Flood Just group or opportunity to integrate adaptation matters within the proposed Climate Just advisory group. 18. The long-term adjustment and potential relocation of critical infrastructure will have significant impacts for maintaining well-connected communities. Network Rail should conduct a strategic assessment of the Wales Route to identify vulnerable infrastructure and should be actively involved in Coastal Groups and Public Service Boards to ensure the well-being implications, and impact to other services, are understood. At the UK scale, there is a need for a high-level debate about the remit of Network Rail funding and its strategic consideration of climate change adaptation.

Recommendations
Ecosystem Resilience
19. Area Statements have the potential to increase opportunities for co-delivering FCERM projects and delivering schemes with flood-related benefits through alternative funding sources. However, it will be important to monitor and evaluate the extent to which Area Statements, once adopted, perform as intended. 20. Resources to support periodic monitoring of area-based approaches will be essential to establish evidence and confidence in new approaches. However, the lack of evidence should not be a barrier to trialling experimental approaches – opportunities to experiment, innovate and learn are essential for enhancing capacities to adapt to future change. 21. Coastal squeeze presents a significant threat to intertidal habitats and the integrity of the Natura Network; however, the delivery of compensatory habitat through the National Habitat Creation Programme (NHCP) is notoriously complex and faces numerous barriers related to working with multiple landowners (with different priorities, planning horizons and remits of responsibility); navigating legal duties to maintain public rights of way and duties of care; reputational risks; and lack of awareness of the implications of SMP2 amongst land/asset owners. In order to keep pace with sea level rise, these barriers will need to be overcome by – a) continued proactive engagement with landowners and service providers to identify potential sites for compensatory habitat early on; b) continuing to promote exception clauses for inviting non-Risk Management Authorities to participate in the NHCP; and c) addressing Recommendations 10, 12, 14 & 18.
FCERM, land-use management and land-sea integration:
22. The significant weaknesses in Technical Advice Note 15 ('*Development and Flood Risk'*) are largely addressed through the proposed changes outlined in the current consultation of TAN 15 ('*Development, flooding and coastal erosion'*); subject to acceptance, these changes will offer better integration across terrestrial and coastal systems. Some potential gaps exist in relation to the development of Strategic Flood Risk Assessment – for instance, engagement with Coastal Groups should be explicitly encouraged in order to better bridge coastal management and spatial planning, and strengthen the role of spatial planning in adaptation efforts. Moreover, the Welsh National Marine Plan should be cited and referred to as a source of evidence, to further join-up thinking across the land-sea interface. 23. Periodic monitoring of the newly-implemented SuDS Approval Bodies (SABs) is essential to ensure their effectiveness is optimised to address surface water risks. 24. Further research is required into appropriate mechanisms for promoting behavioural change and the uptake of property-level resistance and resilience measures, looking across potential mechanisms within FCERM, spatial planning, building regulations and insurance sectors for example. 25. Opportunities for collaborative working, both within/between Risk Management Authorities and other stakeholder groups, should be sought where possible to promote integrated approaches to water management at the catchment/area scale through which multiple benefits can be delivered.

Recommendations
26. It is vital that efforts to join-up thinking across the land-sea interface continue – The review process of the Welsh National Marine Plan and the Marine Planning Decision Makers Group should be used to support this and address common challenges through whole system thinking. There is a need to address resource and funding gaps in order to support coordination across marine and terrestrial planning.
Strengthening the alignment between FCERM and Well-being agenda
27. Push and pull messaging - There is a need for the FCERM community and National FCERM Strategy to better articulate the wider well-being benefits of their activities to attract engagement from others. In turn, this can help unlock opportunities to deliver FCERM benefits through other schemes. 28. Public Service Boards (PSBs) have the potential to play an important part in FCERM governance and facilitate joined-up working. However, the extent to which flooding (and climate change adaptation more widely) has been embraced by PSBs is *ad hoc*. More effort is required to raise the profile of FCERM within PSBs and local well-being plans. NRW as a statutory member of PSBs could facilitate this. Moreover, at the national scale, climate change adaptation should be included as a strategic priority within the Future Generations Commissioner's priority areas, in order to promote its inclusion in well-being planning at the local scale. 29. Efforts should be sustained (and promoted further) within the FCERM community to support the education of children and young adults, to enhance awareness of flood and coastal erosion risks, and climate change more broadly, and also help promote a sense of global responsibility. 30. To support healthy communities, there is a need to raise awareness of the lasting health effects of flooding. However, beyond 'treating' the impact of floods, there is a need to proactively support communities living with risk and uncertain futures in their personal resilience and emotional well-being. The communication of SMP policy changes should be sensitive to this and RMAs should identify where health and social care services, or voluntary groups, might assist the communication process and provide additional support to local communities. Moreover, FCERM should consider where nature-based approaches have the potential to support mental and physical health benefits associated with blue-green spaces, and, in turn, support preventative health care initiatives. 31 The national well-being indicators give a limited picture of fluvial and coastal flood risk, only, focused on numbers at risk. Consideration should be given as to whether there is a need to expand this to include other sources of flood risk, as well as information on the scale of coastal change highlighted by SMP2 policies, given that coastal change presents a significant threat (and potential opportunity) for national well-being. 32. There is a need to think creatively about how FCERM activities might help support and enhance Welsh language skills (e.g. through education pathways), and link to local community initiatives, which may simultaneously help to foster social capital and support community resilience to flooding.

Recommendations
33. In order to ensure the sustainable management and preservation of cultural heritage in the face of coastal change, there is a need to strengthen alignment between the historic environment and FCERM communities. In the first instance, the relationship between the two should be more strongly articulated within the National FCERM Strategy to provide a strategic steer for action on the ground. 34. It is essential that well-being policy and associated governance mechanisms are given time to mature, through learning-by-doing.

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8 ANNEX A – List of interviewees

Table 8.1: Summary of stakeholder interviews

*(*job titles have intentionally been obscured or omitted to preserve anonymity, unless agreed otherwise)*

ID	Organisation	Role/remit of responsibilities	Scale of operation / perspective
1	Gwynedd Council	FCERM	Local
2	Welsh Government	Senior Advisor	National
3	CEH	Senior ecologist (coastal specialist)	Cross-scale
4	Welsh Local Government Association		National
5	Severn Estuary Partnership		Estuary, cross-border
6	Public Health Wales		National
7	Natural Resources Wales	Marine and coastal physical scientist	National
8	Network Rail	Asset management	National
9	Network Rail	Strategic Planning (Wales Route)	National
10	Pembrokeshire County Council	FCERM	Local
11	Natural Resources Wales	National Habitat Creation Programme	National
12	National Trust	Countryside management	Regional
13	Dŵr Cymru Welsh Water		National
14	Natural Resources Wales		Regional
15	Natural Resources Wales	Flood and incident risk management.	National
16	Welsh Government	FCERM	National
17	Welsh Water	Coastal waters	Regional
18	Crown Estate		National (UK)
19	National Trust	Coast and countryside management	Regional
20	Natural Resources Wales	Coastal advisor	National
21	Welsh Government	Spatial planning	National
22	Cardiff University	Academic expert	National
23	National Trust	Coast and countryside management	Regional
24	NFU Cymru	Environment and land use	National
25	National Flood Forum		National (England and Wales)
26	Flood and Coastal Erosion Committee		National
27	Public Health Wales	Health and Sustainability Hub	National
28	Natural Resources Wales	Asset investment and planning	National
29	Cardiff University	Legal expert regarding agriculture	National
30	Denbighshire County Council	FCERM	Local
31	Welsh Government	FCERM programme	National
32	Natural Resources Wales	Flood risk strategy advisor	National
33	Wales Coastal Monitoring Centre		National
34	Welsh Water	Environmental remit	National
35	Severn Estuary Partnership		Estuary, cross-border
36	Marine Conservation Society	Education and engagement relating to marine issues	Cross border
37	WWF-UK	Marine Programme	Cross border
38	NRW	Marine Resource Management	National
39	CEFAS	Seconded to WG to support development of the WNMP	National
40	CEFAS	Seconded to WG to support development of the WNMP	National
41	NRW	Marine Resource Management	National
42	County Council	Planning	Local
43	Coastal Partnership	Strategic management, supporting stakeholder engagement relating to WNMP	Regional

ID	Organisation	Role/remit of responsibilities	Scale of operation / perspective
44	Coastal Partnership	Supporting regional and cross border planning, and stakeholder and community engagement in marine issues, including marine planning.	Regional and cross border
45	Coastal Group Network	Strategic matters surrounding coastal groups and links to national FCERM governance.	National (England and Wales)
46	JBA		Local
47	Royal HaskoningDHV	Shoreline management planning	Sub-national

*List includes interviewees who are also members of coastal groups, Wales Coastal Groups Forum and/or Public Service Boards.

9 Annex B – Summary of documents analysed

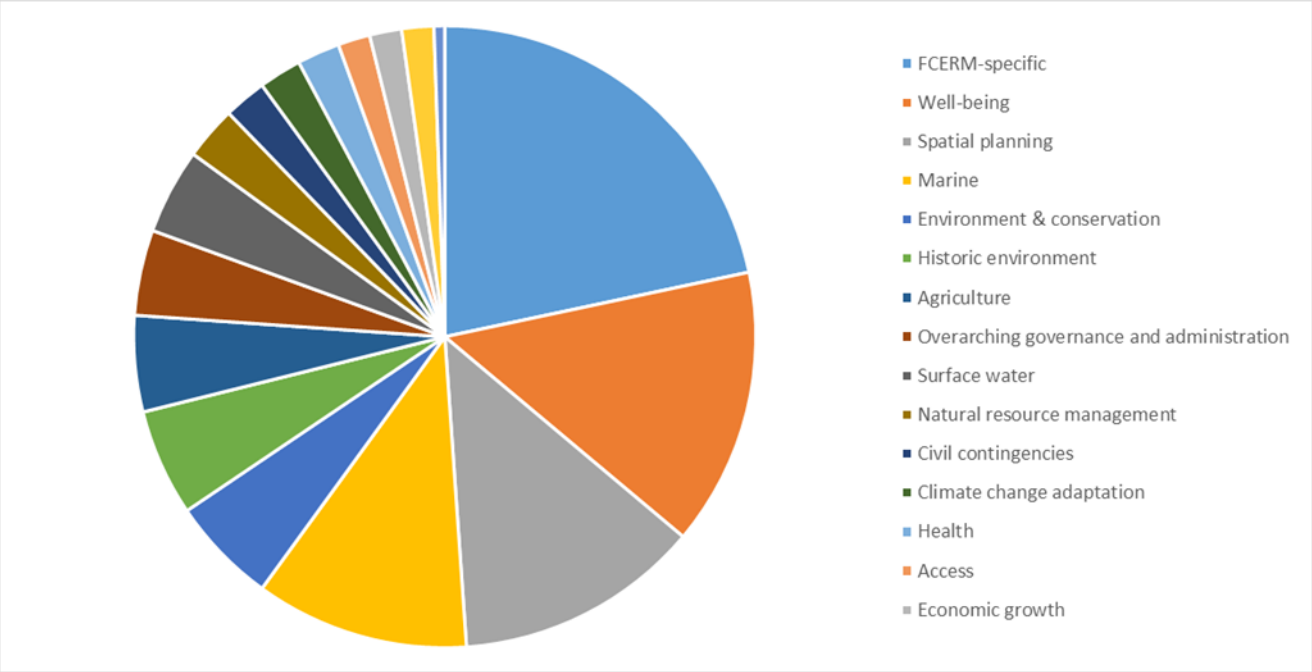

Figure 9.1: Percentage of documents analysed per policy area

10 ANNEX C – A framework for evaluation

Table 10.1: Evaluation criteria

Criteria	Overview of what 'optimal' governance arrangements would look like
Embedding core principles of Ecosystem-Based Management	Policies and practices are underscored by the core principles of EBM, such that actors are required (either by law or by institutional norms) to consider the linkages between ecosystems and the benefits they provide, while aligning goals, objectives and activities etc. across actors, sectors and governance arrangements where relevant, to deliver EBM. A range of highly effective procedures, mechanism and strategies etc. are in place to support this. Moreover, there is an established institutional culture towards EBM.
Integration	A range of highly effective procedures, mechanisms, strategies, polices etc. are in place to ensure the integration of goals, objectives and activities across actors, policy and governance arrangements, where relevant, to ensure a coherent and holistic approach to decision-making. Moreover, there is an established institutional culture towards integration, which may be further reinforced through legislation.
Coordination	A range of highly effective procedures, mechanisms and strategies etc. are in place to ensure effective cross-sectoral coordination where appropriate (horizontal governance), as well as effective coordination across multiple levels of governance (vertical governance). There is an established institutional culture towards coordination, which may be reinforced through legislation.
Collaboration and cooperation	A range of highly effective procedures, mechanisms and strategies etc. are in place to ensure collaborative and cooperative practices between actors. There is an established institutional culture towards collaboration and cooperation, which may be reinforced through legislation.
Stakeholder participation (including public participation)	There is an established institutional culture towards stakeholder engagement and participatory-based decision-making, which may be reinforced through legislation. Stakeholder participation is sought through all stages of the decision-making process, based on a model of knowledge exchange (rather than consultation). All relevant stakeholders have been involved (inclusiveness) to ensure that different perspectives, values and agendas of different stakeholders are represented and deliberated within decision-making (representative deliberation). There is a clear demonstration of how stakeholder participation has influenced the final decision and justification for how said decision was reached through participatory processes.
Scale	*Temporal scale* - The decision-making process must consider and balance short-term and long-term needs. This is either required by law or through an established institutional culture. There are highly effective procedures, mechanisms and strategies etc. in place to ensure the temporal synergy of decision-making. *Spatial scale* - Decisions are made (and adequately supported) at the appropriate spatial scale according to the nature of socio-environmental issues. This is either required by law or through an established institutional culture. There are highly effective procedures, mechanisms and strategies etc. in place to ensure this. Administrative scales do not interfere with this process.
Evidence-based decision-making	There is an established institutional culture that recognises the importance of evidence-based decision-making. Decisions must be informed through the responsible use of sound science, as well as the inclusion of interdisciplinary

Criteria	Overview of what 'optimal' governance arrangements would look like
	knowledge (as is best available) and other forms of valid knowledge (e.g. stakeholder expertise and indigenous knowledge), as appropriate. Uncertainty of knowledge/scientific evidence is acknowledged and made clear. All evidence is traceable and appropriately cross-referenced. There are highly effective procedures, mechanisms and strategies etc. in place to ensure evidence-based decision-making.
Learning	There are highly effective procedures, mechanisms and strategies etc. in place to periodically monitor, evaluate and review current practices, policies, programmes and specific measures etc. There is an established institutional culture towards learning and improvement, which may be reinforced through legislation. Opportunities for learning are enabled (e.g. experimentation/innovative schemes etc.). There is clear evidence that 'lessons learned' are implemented and widely communicated and shared with relevant actors.
Uncertainty & flexibility	There are highly effective procedures, mechanisms and strategies etc. in place to ensure the robustness of measures, strategies and policies etc. under changing conditions (*where robust is understood as the ability to maintain effectiveness under different climatic and socio-economic development scenarios). There is sufficient flexibility to make adjustments to measures, strategies and plans etc. as required. There is an established institutional culture that recognises the importance of working within the boundaries of uncertainty.
Institutional capacity	There are highly effective procedures, mechanisms and strategies etc. in place to identify and address shortfalls in capacity that might otherwise limit the ability of competent authorities to perform their duties, or adapt to changing conditions. There are sufficient resources and opportunities (e.g. training) to maintain and/or enhance institutional capacity as required.
Valuation methods	There are highly effective procedures, mechanisms and strategies etc. in place to ensure that appropriate valuation methods are used to inform decisions (e.g. measures, plans, strategies and policies), as well as resource allocation. Monetary and non-monetary values (including intrinsic values) are equally considered. There is an established institutional culture for using these methods.
Resource efficiency	There are highly effective procedures, mechanisms and strategies etc. in place to ensure the efficient and proportional use of resources. There is an established institutional culture towards the joined-up delivery of multi-beneficial schemes/initiatives where appropriate. Redundancy in the system is reduced as far as possible (in balance with resilience requirements). Resource efficiency successfully balances short-term and long-term costs and benefits.
Transparency and access to information	There are highly effective procedures and mechanisms etc. to ensure that the decision-making process is transparent, so all can see how decisions were made. Trade-offs within the decision-making process must be articulated and fully justified. All stakeholders have equal access to relevant information. Competent authorities must raise awareness amongst all stakeholders of where/how to access this information. There is an established institutional culture of transparent decision-making.
Accountability	There are highly effective procedures and mechanisms etc. for stakeholders to challenge decisions that have been made and hold the actor(s) involved to account. The Rule of Law is upheld (e.g. enforcement of legal principles such as 'Polluter Pays'). Formal roles and responsibilities are clearly defined, periodically

Criteria	Overview of what 'optimal' governance arrangements would look like
	monitored for compliance and enforced. All stakeholders are equally able to challenge decisions that have been made and hold relevant actors to account.
Social equity, fairness and justice	All activities, initiatives, policies etc. must be enacted in a way that does not disadvantage certain groups over others; this is supported through the use of highly effective mechanisms and procedures etc. The distribution of costs and benefits are fully considered within the decision-making process and communicated to those affected. Inter-generational equity must be considered, with highly effective mechanisms and procedures in place to ensure decisions taken today do not disadvantage future generations. There is an established institutional culture towards principles of equity, justice and fairness.
Societal resilience	*Capacity to resist* - There are highly effective mechanisms, procedures and strategies etc. in place to reduce the likelihood and magnitude of most environmental disturbances and shock events, within acceptable limits. There are sufficient resources to support this. *Capacity to absorb and recover* - There are diverse and highly effective measures, procedures and strategies etc. in place to ensure that risk is addressed in a holistic, multi-layered way that minimises the consequences of shocks/pressures and maintains the basic functioning of the system, while ensuring full recovery within an acceptable timeframe. The principles of risk management are embedded within institutional cultures, and may be further reinforced through legislation. *Capacity to adapt* - There are diverse and highly effective measures, procedures and strategies etc. in place to identify and implement changes where required, so as to improve the ability of the system to respond better to shocks/pressures under changing socio-economic-environmental conditions in the future. These ensure learning, innovation and experimentation. There is an established institutional culture towards adaptation, which may be reinforced through legislation.
Ecosystem resilience	Highly effective mechanisms, procedures and policies etc. are in place requiring the decision-making process to consider the impact of activities/policies etc. upon ecosystem resilience and ensure appropriate actions are taken to prevent and mitigate potential adverse consequences, while striving to maintain and enhance ecosystem resilience wherever possible. All decisions/activities are required to take place within the environmental limits of ecosystems, and according to the Precautionary and Prevention principles. Where feasible, activities/measures must work with natural processes. There is an established institutional culture towards fostering ecosystem resilience wherever possible.
Economic resilience	*Resist/counteract* - There are highly effective mechanisms, procedures and strategies etc. in place to reduce the likelihood and magnitude of most shock events/pressures upon the economic system, within acceptable limits. There are sufficient resources to support this. *Absorb and recover* - There are diverse and highly effective measures, procedures and strategies etc. in place to ensure that risk is addressed in a holistic, multi-layered way that minimises the consequences of shocks/pressures and maintains the basic functioning of the economic system, while ensuring full recovery within an acceptable timeframe. The affected aspect(s) of the economic system are sufficiently able to buffer, absorb and cope with the impact of shock events at micro/meso economic scales (e.g. business continuity planning, insurance mechanisms etc.). Resources are available, and allocated

Criteria	Overview of what 'optimal' governance arrangements would look like
	appropriately, in a way that facilitates a speedy recovery. There is an established institutional culture to prepare for potential shocks/pressures. *Adapt* - There are diverse and highly effective procedures, mechanism and strategies etc. in place to identify, learn and implement change where required, so as to improve the ability of the economic system to better respond and cope with future shocks/pressures (under changing socio-economic-environmental conditions). There is an established institutional culture towards adaptation (e.g. sectoral diversification may be an adaptive response to reduce future dependency on a single sector).
Well-being	There is an established institutional culture towards enhancing and maintaining human well-being. Well-being is recognised as multi-dimensional, comprising material, relational and subjective dimensions. Highly effective mechanisms, procedures, policies etc. are in place to ensure that well-being is embedded in decision-making and practice, and that this is effectively monitored. Full consideration is given to both current and future generations.

END OF DOCUMENT

For further information contact Dr Meghan Alexander at M.Alexander@uea.ac.uk

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