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The Relevance for Flood Risk Management in the Chinese Pearl River Delta**

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# Chapter 4

## Territorial Governance and Spatial Planning in Europe: The Relevance for Flood Risk Management in the Chinese Pearl River Delta



Vincent Nadin and Meng Meng

**Abstract** China and Europe have the common problem of mitigating flood risk, a problem partly created from poor management of the urban transition now compounded by the effects of climate change on sea level and extreme weather events. Adaptation to these effects requires extensive cooperation between administrative jurisdictions and policy sectors to strengthen shared land resource management. Governments generally look to urban planning to resolve potential damaging competition between sectoral policies, but it is often not well-equipped for this task. In Europe, there has long been recognition of the need to improve territorial governance, in part through a spatial planning approach that coordinates the place-based impacts of sectoral policies and helps in the cross-fertilisation of policy making across policy silos. How can this experience inform the urban transition in the Pearl River Delta? Experience in Europe points to new institutions that are needed to reduce the costs arising from non-coordination. Spatial planning must engage a wide range of stakeholders to build trust and ownership of a shared strategy. Plans need to be adaptive in the face of great uncertainty. These prerequisites for more effective territorial governance present a huge challenge for both Chinese and European policy makers.

**Keywords** Territorial governance · Spatial planning · Cross-fertilisation · Adaptation

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## 4.1 Introduction

All countries face the challenge of managing the transformation of their territories in the face of competing demands for land use. The overwhelming trend of that transformation has been the conversion of natural open land and agricultural land to urban uses. The drivers are the demands of economic and demographic growth, fuelled by government policies that supply land for development and the infrastructure that facilitates it (Nuissl and Siedentop 2021). This pattern of land-use change is described as land consumption, or the urban transition. It is partly a product of urbanisation (the shift of people from rural to urban settlement and lifestyles) but equally significant is decreasing settlement densities driven by location preferences for more space and infrastructure provision (McGranahan and Satterthwaite 2014).

The urban transition has both positive and negative effects on sustainable development. The classical argument is that urban agglomeration, or the growth of cities, is necessary for growing a productive industrial economy, and in developed countries, to facilitate the knowledge economy. But land consumption comes with significant costs, and these can be acute where urban uses are fragmented and do not respect the value of natural environmental systems. Critical natural resources are wasted, and new environmental risks are created, including flood risk. The balance of urban and non-urban land use is crucial to the sustainability and long-term viability of cities, since ‘without natural capital the very life systems of the planet will close down’ (Helm 2016, p. 241). Natural capital includes the drainage system of rivers, estuaries and floodplains. Urban development has depleted and damaged these and other natural resources at an alarming rate, with evident consequences for the number of cities exposed to damaging floods or much increased risk.

Governments claim to manage the negative externality effects of urban development through urban planning and other land policy tools. However, there are few examples of where this has been done well. Instead, widespread damaging effects of urban development are the norm. Reasons include the overriding policy priority of economic growth, competition between landowners and municipalities, professional incompetence and corruption. And in most places, the shortcomings of a weak urban planning system also play a part, lacking the tools and political backing that can anticipate, identify and measure risks and mitigate or compensate for them. Weakness is built into urban planning because of the silo mentality of government that separates sector policies such as urban planning, economic investment, water management, agriculture and transport. Each is insulated from its wider externality effects, or to put it another way, there is little cross-fertilisation of policies and actions. This adds up to poor governance of the urban transition, and whether now or later, huge costs of non-coordination in the destruction of damaged natural capital and increased risks (Robert et al. 2001).

The costs of weak management of the urban transition, and more broadly ‘the territory’, become more visible as the loss of the natural systems that support it cross critical thresholds. Examples are the point at which clean drinking water becomes scarce, when air pollution keeps people in their homes, or where surface

water drainage and flood protection systems fail. Climate change has accelerated the path to these thresholds, especially in relation to flood risk in the face of sea level rise and extreme weather events. The World Meteorological Organisation has warned that the worst is yet to come: ‘the last time the Earth experienced a comparable concentration of CO<sub>2</sub> ... the temperature was 2–3 °C warmer, [and the] sea level was 10–20 m higher than now’ (WMO 2019). It is self-evident that the potentially catastrophic consequences of the threats of climate change partly created by poor urban development practice demand more effective governance of the urban transition. It requires extensive cooperation between administrative jurisdictions and policy sectors to strengthen shared land resource and water management. In Europe, the term ‘territorial governance’ is used to describe the coordination of all sectoral policy making and implementation that has a spatial or territorial impact, that is, it influences land-use change and the spatial distribution of activities and opportunities (ESPON 2013). Good territorial governance involves the pursuit of active convergence of the territorial impacts of sectoral policies.

More effective territorial governance is a central aim of the EU, reflected in its explicit high-level goal of ‘territorial cohesion’, the integrated development of the European territory to ensure all citizens have equal access to opportunities. Territorial cohesion can be delivered in part through a spatial planning approach that coordinates the place-based impacts of sectoral policies and helps in the cross-fertilisation of policy making across sectors. This a very difficult and long-standing challenge for both Chinese and European policy makers. Shifting to a spatial planning approach and strengthening the cross-fertilisation of policy demands reformed institutions, engagement of many stakeholders to build trust and ownership of a shared strategy and reformed tools that offer discretion in complex decision environments. The objective of this chapter is to explain how territorial governance and the spatial planning approach have evolved in Europe and to explore what relevance they have for China and particularly, flood risk management in the Pearl River Delta.

In territorial governance, the cross-fertilisation of sectoral policies is crucial. It is ‘the interaction between sectoral policy decision-makers that creates complementarity, increases efficiency through synergy and avoids the costs of non-coordination’ (Nadin et al. 2021, p. 3). Cross-fertilisation is central to the integrative and multiscale design and planning approach that is needed for the adaptive urban transformation of urbanising deltas introduced in Chap. 1.

There are strong similarities in the land and water resource management challenges in China and Europe that suggest there is potential benefit from mutual learning about how best to tackle them, despite fundamental differences in government, culture and urban geography. In China, the drive for economic growth since 1986 under a system of state capitalism has delivered an incredibly rapid urban transition, the conversion of vast swathes of open land to urban uses, alongside high urbanisation rates. Economic growth has brought prosperity and a new middle class and taken many millions out of poverty. It has also entailed huge costs, not least in the Pearl River Delta (PRD), one of the great urban agglomerations in Asia, but also one of the most vulnerable locations to increased flood risk in the context of climate change (Nicholls et al. 2007).

In Europe, there has been a similar expansion of urban land uses although over a much longer period. The major agglomerations are in north-west Europe where the industrial revolution fuelled urban growth from the eighteenth century. Although from the 1950s, there have been relatively modest rises in economic activity and shifts in population, increasing prosperity, mobility and consumer demand has continued to drive a demand for land conversion. North-west Europe's economy continues to strengthen relative to most of the rest of Europe. Thus, population and wealth generating economic activity will remain in this economic powerhouse, yet it sits on a delta that is highly vulnerable to flood risk, with sea level rises forecast to be between 0.8 m during the twenty-first century (EEA 2021).

It is not surprising therefore to see similar regional spatial strategies adopted in both North-west Europe and the Pearl River Delta, as shown in Fig. 4.1. There is thus sufficient in common to justify the objective of this chapter to outline the potential value of experiences in Europe in territorial governance for China, especially in relation to flood risk management. EU institutions have made great efforts since the 1980s to encourage more effective territorial governance that addresses competing objectives for economic growth, environmental sustainability and social cohesion, in the context of the risks of climate change. The same considerations have also come to the forefront in China. We argue here that effective territorial governance calls for a 'spatial planning approach' that facilitates cross-fertilisation of sector policies. In the next section, we explain the general meaning in Europe of the notions of territorial governance and the spatial planning approach. We then give a brief history of their evolution with reference to flood risk management and the incentives provided by the EU to stimulate more policy coordination. We end this section with a summary of the latest recommendations on the steps that European governments can take to improve cross-fertilisation. We end with a discussion of the relevance of the European experience for the Pearl River Delta, and tentatively point to three aspects that will be of particular interest in China.

## 4.2 The Challenge of Territorial Governance

Managing the territory and the urban transition is a multidimensional, multisectoral exercise. It involves all 'sectoral policies' of government. Economic investment, environment, agriculture, water management and transport are the first to come to mind, but other sectors can be equally important: social, health, education, research and development and others. The successful implementation of one sectoral policy is interdependent with others. Sometimes, these connections are obvious: the development of a new urban extension demands transport infrastructure, economic investment, housing, environmental services and the education and health facilities essential for residents. Others may be less obvious, e.g. the way that research and education investment may shape demand for housing. It may seem surprising that the interconnectedness is not always thought through in policy making, but this is the norm. It is accepted that government makes policy in sectoral silos which,



**Fig. 4.1** Strategic planning documents in Europe and the Pearl River Delta. Clockwise from top left, outline development plan for the Guangdong-Hong Kong-Macao Greater Bay Area (Chinese version and courtesy translation into English; Greater Bay Area development office, 2019); Territorial agenda 2030 (European Commission 2021a, b); A Spatial Vision for North-west Europe (NWMA 2000); and the European Spatial Development Perspective (CSD 1999) (German edition)

despite various coordinating mechanisms, often pays scant attention to other sectors. Sub-national and local governments also make policy within their jurisdictional compartments—the geographical scope of their power. Their policies will often reflect competition with their neighbouring authorities rather than complementarity. This are a long-standing barrier to effective governance of the territory (European Commission 1998). Policy making in discrete sectors has advantages, it is certainly less costly than seeking coordination, and integration with other sector policies may dilute central objectives (Peters 2018; Candel 2021). It is inevitable that the complex

task of government must be compartmentalised by sector, and within administrative boundaries. But independent sectoral policy can lead to uncoordinated implementation, contradictory actions, waste of resources and missed opportunities for synergy.

Examples of the ‘costs of non-coordination’ abound. In Europe, there are the great white elephants of infrastructure investment in air and rail facilities that are redundant or underused because of lack of attention to the wider policy environment in their planning. Other examples are more common in many countries: policies that encourage more intensive agriculture that contradict pollution reduction targets; investment in transport in infrastructure that encourages fragmented urban development lacking basic services and destroying critical natural capital; and renewable energy subsidies that undermine local food production. Of many other examples, we should mention the way that contradictory actions of different parts of government can increase flood risk. There is a long history of human intervention in water systems going back centuries, but it is from the twentieth century that technology has allowed for large-scale interventions in transport, agriculture and construction that, whilst well-intentioned, have left a legacy of huge vulnerability as evidenced in the catastrophic flood events in, e.g. Bangkok (Marks 2015) and Houston (Ersoy et al. 2023). And the damage continues; it is not unusual in the 2020s to see sectoral policies promoting investment in the most vulnerable places, putting people and capital in harm’s way, damaging natural systems and increasing flood risk.

The common threat is that the contradictions become very apparent in specific localities or places. The goals of government to reduce the risks of climate change, to husband natural resources and to share prosperity are spatial challenges—they involve interventions in particular places. Similarly, every sectoral policy has a territorial impact, whether explicitly expressed in policy or not. Whilst measures may be expressed in aspatial terms, relating, e.g. to a particular social group or activity for investment, they will affect the distribution of urban and rural development. Where such impacts and interconnections are not anticipated, the effect of the investment on a city or region can be sub-optimal or inefficient, and in the worst cases can even be counterproductive.

Why is it that there is too often insufficient attention to the spatial or territorial impacts of policy, or the contradictory effects of different sectoral policies as they combine or clash in particular places? It is undoubted that a policy silo ‘mindset’ is common in government in many countries. Governments may welcome competition between sectors, professional boundaries of interest may be rigid, and the relative power of sectors are important factors. Governments may set short-term goals and often make economic growth and ‘prosperity’ the priority, giving power to sectoral departments to implement policy and require other departments to simply facilitate the implementation of priority goals. In the countries of the EU that are lagging in prosperity, the priority to invest in infrastructure has run counter to sustainable development goals but continues in places because the power of infrastructure investment departments has grown with the receipt of EU regional policy funding (Nadin et al. 2021). These departments often lack the professional competences and evidence base to understand the wider strategic and longer-term effects of policy. The procedural

safeguards and civil society institutions that can provide a check on government actions are often weak.

Governments are very aware of the potentially damaging costs of non-coordination. They generally understand that the great challenges facing governments crosscut many sectoral policies. They will understand generally that the success of efforts made for more a sustainable and resilient urban development or transition depend on sectors of government working in concert, but there is a tension between cooperation and competition. Governments at all levels have created new institutions to foster cross-fertilisation of sector policies such as coordination tools, organisations and practices to tackle national and global commitments for more sustainable and resilient development (Asarpota and Nadin 2020; Seto et al. 2014). However, in many countries, there is a continuing expectation that the established tools of the ‘urban and regional planning and design system’ will coordinate the effects of sectoral policies on places, but often, the planning system is not well-equipped to perform this role. The challenge for north-west Europe and the Pearl River Delta is to design and strengthen their territorial governance institutions to facilitate cross-fertilisation of sectoral policies—between the sectoral silos of government and across municipal boundaries.

Why are urban and regional planning systems not well prepared to foster cross-fertilisation? In all countries there is, to a greater or lesser extent, a discrete collection of interconnected institutions (laws, tools and practices) that have been created to plan, design and regulate urban development—the transformation of cities and countryside. Part of this task involves mediating the many competing interests involved. There is great variation in the mechanisms, but in most countries, there is something that can be described as a ‘system’ of urban and regional planning (or city and regional planning, town and country planning or other variants). The system will involve designs and strategies at different scales, procedures for regulating development through plans and the allocation of development rights, land policy tools that impose development taxes, recoup betterment (value capture) or provide for compensation and tools for engaging stakeholders and citizens in decision-making. Planning systems are powerful tools if backed up with political will and good governance. However, they are in effect, one sector policy and they are likely to be a relatively small and weak part of government policy that shapes the territory, particularly the urban transition. Planning systems tend to be in the position of servicing the needs of other priority government policies.

As we explained above, other sectoral policies can have a strong influence on the territory that may range in effect from complementary to dominating. Water management or coastal zone policy may assist planning tools in preventing urban development in flood risk zones. Economic and infrastructure investment may help to divert development interests away from vulnerable locations and ensure efficient use of the land resources. However, powerful sectoral policy can dominate the path of urban development. An important example in the EU is regional policy funding (Cohesion Policy) supporting the growth of lagging regions, which can dominate decision-making and become a ‘de facto’ urban planning, in competition with the approved plans and undermining planning goals. There is also the crucial role of



market actors whether these are major real estate developers or the aggregate demand of many small consumer decisions. The relationships between sector policies and market actors will vary, in some cases government policy will align with market demands, others may be in opposition.

The messy multisectoral environment that shapes urban development cannot be resolved by mandate that the urban planning system be followed absolutely. Competing objectives and policies in government are the norm, across different sectors and among the levels of government administration—national to municipal. Each will have its own source of legitimacy. Clashing sectoral policies is a problem of ‘governance’.

We can explain the significance of the notion of governance for planning with reference to three interrelated points (for a more thorough review see Schmitt and Wiechmann 2018; Schmitt and Well 2016). First, in Western countries, the power of a centralised government has become more fragmented and dispersed. This includes power within the government machinery where traditionally dominant departments are now sharing power with others that focus on key global challenges, notably in natural environmental matters. Government is also sharing decision-making with interests in the market and civil society sectors, in response to increasing private involvement in public services and the growing strength of non-governmental organisations. This dispersal of power in the making and implementation of policy can have advantages in the feasibility, robustness and acceptability of policy, but it requires much more interaction among stakeholders. Second, the idea of urban planning as simply an expert-led technical or scientific process of finding the most appropriate means to achieve ends given by the political process is long gone. Planning’s core work is in mediating the competing value positions of many stakeholders. It is a process of deliberation among many interests considering the evidence and seeking a shared way forward. And we recognise that planning itself is not a neutral objective practice but involves values. The idea of a value-free technical planning was never an accurate explanation of actual practice; the value judgements were hidden. Third, the recognition of dispersed power and the mediation role of planning renders the traditional, plan, design and control approach redundant. Again, it was probably never an accurate explanation of practice, but the notion of ‘control’, especially in a top-down way is certainly no longer appropriate when government relies so much on other actors to achieve its objectives. Furthermore, the rigid planning tools used to try to control urban development have proved inflexible in the face of uncertainty and complexity in decision-making (Zandvoort et al. 2018). There is a shift towards a more ‘adaptive rationale’ in planning (Skrimizea et al. 2019) that offers discretion to decision-makers to respond to fast-changing technological and socio-economic circumstances in response to the position of stakeholders, and to encourage innovative solutions (Nadin et al. 2020; Nadin et al. 2021; Rauws et al. 2014). Increasing use of strategic spatial plans is part of the recognition of the ‘governance landscape’ of which planning is a part (Healey 2007). In the strategy making process regional design where the spatial effect of combined decisions can be visualised and shared is also invaluable (Balz 2018).

With these points in mind, planning is conceived as the ‘governance of place’ or ‘place governance with a planning orientation’ (Healey 2010). In this place governance, there is a shift in structures that channel or command policies on business and stakeholders through a hierarchy of government levels to more complex relationships in a multi-level and multisectoral governance system of shared interest and power. It recognises that the efficiency and effectiveness of policy and interventions are enhanced if they are designed for specific places with local interests involved (Barca 2009). In Europe, this ambition has been summed up in the notion of territorial governance, ‘a place-based, territorially sensitive and integrated approach to policies’ (ESPON 2013; Schmitt and Van Well 2016).

We argue that the place-based ‘territorial governance’ approach to planning is vital for the future of deltaic regions. Planning in such places is ‘a messy back and forth process with multiple layers of contestation and struggle’ (Healey 2007, p. 182). The complex mix of ecological and urban systems can only be managed by bringing together a scientific assessment of conditions and opportunities into a discursive and deliberative process engaging with the many government sectors and stakeholders who have experience to bring forward into the planning process. The problem is not one of ensuring conformity with a rigid plan but of encouraging sectoral policy makers and stakeholders to make a collective effort to solve problems within a robust framework of policies. Adaptive urban transformation stimulates a redesign of planning mechanisms that can safeguard critical natural assets whilst giving discretion to decision-makers to adapt proposals to achieve shared objectives. A central component will be regional design processes and visual outcomes that can persuade and inspire stakeholders to follow a common path.

We now turn to experience in Europe, where the notion of ‘territorial governance’ is employed to boost regional cooperation and to inject a spatial or territorial dimension into sectoral policy.

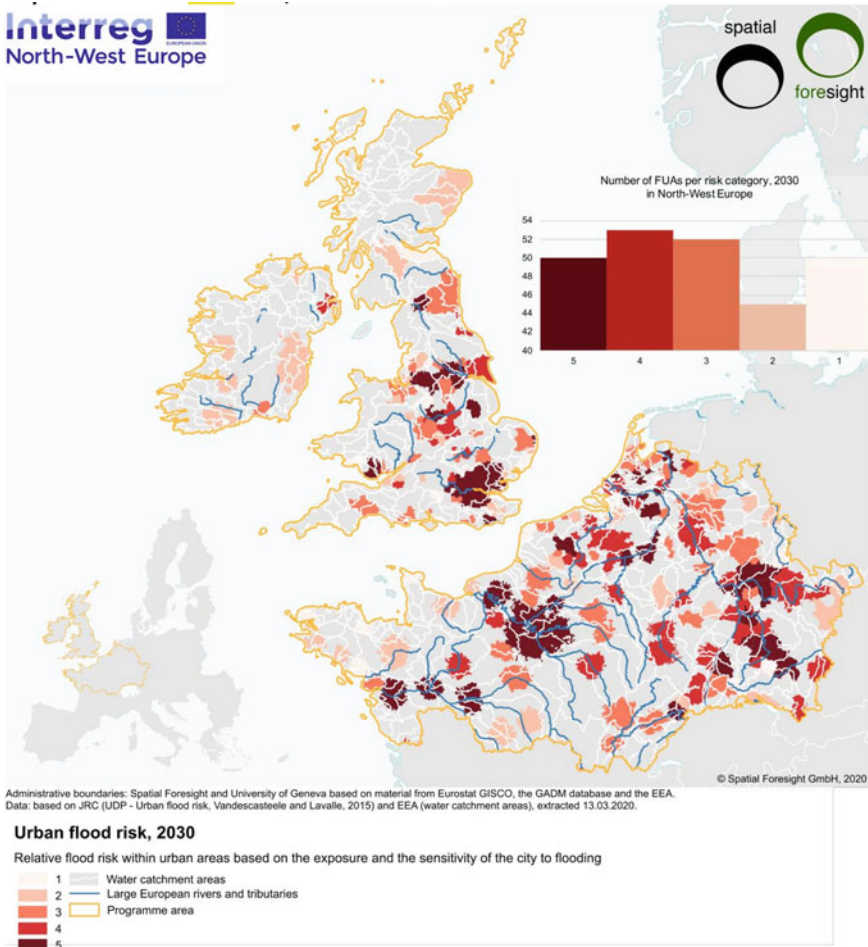
### 4.3 European Experience

Europe urgently needs to build its resilience to the consequences of climate change, including flood risk. More than 40% of the EU’s population lives within 50 km of the sea and 100,000 people are faced with coastal flooding annually (EEA 2016, 2019). Coastal and river flooding together caused 4300 deaths between 1980 and 2017 and displaced half a million people, whilst in 2021 alone, the losses through more frequent climate-related extreme events was costing an estimated 12 billion euros per year. Governments are strengthening their response to flood risk. In 2021, the EU adopted its vision to become a climate-resilient society, the main pillars of which are more systematic and faster adaptation (European Commission 2021a, b). Part of the adaptation process has required, since 2007, that member states prepare flood risk management plans and to report annually on progress. All member states have prepared risk maps and action plans, but with intensification of the hydrological cycle the outlook is grave.

The European Environment Agency points out that one in five European cities over 100,000 population are very vulnerable to flooding. It emphasises the multisectoral nature of flood risk in saying that increases in the costs of flooding are ‘mainly due to land-use change, increases in population, economic wealth and human activities in hazard prone areas’ (EEA 2016, p. 1). The causes vary. Land resource management in some European countries is weak with informal or unregulated development in the ‘uncontrolled spread of towns and villages into undeveloped areas’ (EEA 2016, p. 1). In north-west Europe, officially sanctioned development plays a part, consuming valuable open land, often flood plains, and concentrating in the economic heartland which is already subject to high environmental stresses and flood risk. Figure 4.2 shows the urban areas expected to be at highest risk of flooding in north-west Europe by 2030, ‘based on the exposure and the sensitivity of the city to flooding’ (Spatial Foresight 2020, p. 57). Europe’s biggest cities, London and Paris are among 50 functional urban areas (FUAs) in the highest category of risk. Despite the widespread incidence of flood events, not all governments have joined up policy responses in different sectors (Fig. 4.3). For example, one in ten of all new homes in England from 2013 to 2020 have been built on land at the highest risk of flooding (Environment Agency 2021). This is just one of many examples of the costs of non-coordination.

Since the 1960s, steps have been taken to strengthen territorial governance in areas of flood risk, at first by countries especially vulnerable, notably the Netherlands and Belgium (Dühr et al. 2010). Awareness of the potential for better coordination spread across Europe following publication the *European Spatial Development Perspective* (CSD 1999). This was and continues to be an influential document in the 2020s. It advocates a ‘spatial planning approach’, a form of planning that takes sectoral policy cross-fertilisation as its main task, injects an explicit spatial dimension into sectoral policies and adopts common spatial objectives for all development projects. This integrated spatial development requires vertical cooperation between administrative levels, horizontal cooperation between sectoral policies and geographical cooperation across jurisdictions. The *Compendium of European Spatial Planning Systems and Policies* had anticipated these developments by defining ‘spatial planning’ in Europe as measures to coordinate the spatial impacts of other sectoral policies, ... and to regulate the conversion of land and property uses’ (CEC 1997, p. 24).

The 2000s were marked by intense debate across Europe about the role of the planning system in facilitating the spatial planning approach. Subsequently, some countries made substantial reforms to planning systems, though not always lasting (Nadin, 2006). The reforms put less emphasis on outputs in terms of volume of development and more on outcomes such as the quality of places. They called for indicative strategies to foster cooperation among stakeholders as well as imperative regulation of land use. Efforts have been made to understand the combined effect of sectoral policies on the qualities of those places, including flood risk, first, through environmental impact assessments and later, more encompassing territorial impact assessments (ESPON 2013). From the 1990s and following successful cooperation on flood risk between Germany and the Netherlands, the EU has encouraged cross-border working through the Interreg Programmes, which in the period from 2021 to 27 provides more than 2 billion euro per year for cooperation projects. National reforms recognised the need



**Fig. 4.2** Urban flood risk in north-west Europe, 2030. *Source* Spatial Foresight GmbH (2020, p. 57), courtesy of Kai Böhme and Sebastian Hans

for wide engagement with stakeholders in a process of mutual learning, but urban planning, the regulation of land use, was by no means abandoned. It predominates and is in any case essential in giving legal effect to strategic agreements.

Adoption of a spatial planning approach—strong cross-fertilisation—means that sectoral policy departments must relinquish some power, responsibilities and accountability must be adjusted, systems require new tools and professions must rethink their culture. Governments have a major challenge in encouraging such changes in behaviour, and it is not surprising therefore, that performance on cross-fertilisation in policymaking is patchy. There was a flurry of planning reforms in a number of countries in the 2000s, but there was much less interest after the 2008

**Fig. 4.3** Flood warnings in England



recession. There has also been resistance where there is a strong urbanist or architectural tradition in planning, and where more neo-liberal attitudes prevail. Nevertheless, there is evidence that the notion of 'the spatial planning approach' has been influential. By the late 2010s, cross-fertilisation was more intensive, not just information sharing among sectors, but involving active cooperation and sometimes coordination of policy (Nadin et al. 2018). Improvements have been gained by bolting on ad hoc tools to the planning process, such as impact assessments of policy, requirements for conformity among plans, joint working on data and analysis and ad hoc cooperation platforms. In some countries, the scope of plans and strategies has been widened.

Whilst there is evidence of a gradual reorientation of planning from the 1980s, there is no common path. Much depends on local conditions, especially the social model, itself a product of history, local conditions and challenges (Nadin and Stead 2008). Different facets of the spatial planning approach are in evidence as governments incrementally reform planning systems to the task of territorial governance. Some indications can be given from a survey of planning reforms in 32 European countries (Nadin et al. 2018). They include more emphasis on the outcomes of policy and intervention, e.g. by asking not so much how much dyke is built but how much flooding occurs. Whilst elements of binding regulation remain important, e.g. for the protection of critical natural assets, there is more attention to planning tools that seek to shape the attention and actions of other policy sectors and stakeholders. Thus, planning documents are more likely to include a strategic element at national and local scales, and the measure of success is as much about the influence on other sectoral plans as on direct implementation of the plan.

The adoption of spatial planning principles in their entirety is perhaps unrealistic, but many countries are on a slow trajectory towards the spatial planning approach, and thus, it is argued, more efficient and effective interventions that may reduce flood risk. However, the idea has been discussed for 30 years with only partial take up. The reason is the 'stickiness' of deeply embedded institutions—the ways things are done. There is a lack of trust between sectors, limited learning capacity in sectors and professions, a proliferation of tools that are designed for control and not collaboration, and increasingly neo-liberal political attitudes. Therefore, we should emphasise that

cross-fertilisation through the spatial planning approach is not possible without a rethink of professional and departmental cultures.

In 2021, an extensive dialogue was conducted among European experts in 32 countries, together with a case study in the Czech Republic, on the extent and further potential for cross-fertilisation of sectoral policy and the role that spatial planning can play (Nadin et al. 2021, pp. 16–17). The dialogue explored many examples of good practice in cross-fertilisation that may be useful for other settings, and not only in Europe. The findings, agreed with the body of experts, are presented in a policy brief for governments which provides an overview of the mechanisms that are available to government to improve cross-fertilisation and thus the efficiency and effectiveness of sectoral policies (Box 4.1). There are seven practical steps that may be taken to improve cross-fertilisation, all of which are relevant to flood risk management. We would highlight here the importance of the first point which stresses the need to create ‘favourable conditions’ particularly by addressing the professional and cultural dimension of departmental, municipal and professional groupings that can hold back innovation in policy making.

**Box 4.1: Seven practical steps towards better territorial governance through cross-fertilisation**

- **Resolve unfavourable conditions** that will hinder measures to strengthen cross-fertilisation, ensuring inclusive good governance practices and challenging the dominant ‘policy silo’ mindset through institutional and individual capacity building.
- **Know the territorial impacts of sectoral policy** by making use of territorial impact assessment (TIA) and consultation with stakeholders to evaluate and monitor the combined impacts of policies.
- **Test the complementarity** of investments made by cohesion policy and other sectoral policies with spatial planning strategies, identifying and mapping inconsistencies and proposing actions to foster more consistency.
- **Lift communication barriers** that stifle joint working, by promoting the use of the same key terms, territorial units, indicators and data sets in policymaking, and set out priorities and responsibilities for action on harmonisation
- **Champion joint working** in territories where it is a priority to strengthen the efficiency of investment, at first through voluntary cooperation, and, if needed, through statutory ad hoc agencies that can take on a leading role in joining up policies and actions.
- **Promote place-sensitivity in cohesion policy** by ensuring that the territorial dimension is given more priority by the managing authorities, including the spatial effects of investment and its relationship to existing spatial planning objectives.

- **Customise spatial planning tools for cross-fertilisation** to create more responsive spatial strategies and plans that get to grips with investment opportunities, and align the rhythm of strategy and plan reviews.

*(Nadin 2021, pp. 16–17).*

#### 4.4 Discussion and Conclusion

Europe has experienced dramatic changes in land use since the industrial revolution which have accelerated from the 1950s. Much conversion of open land to built-up land is in vulnerable coastal zones, often where there is long-standing flood risk. In common with the rest of the world Europe faces increased flood risk and threats to life and property arising from climate change. EU institutions and domestic governments have taken decisive action to better manage the conversion of land use and thus reduce the growth in risk, including binding requirements for flood risk assessment, management plans, impact assessments and monitoring of land-use change in the coastal and riparian zones. There have been repeated calls for more effective cross-fertilisation of sectoral policies to ensure complementarity and seize opportunities for win–win solutions by adopting a spatial planning approach that is more adaptable, integrative and inclusive. Considerable EU funding has been made available for encouraging cooperation across municipal, regional and national borders. These initiatives have certainly had an impact on practices, though with variation across Europe. Governments are rethinking planning to promote stronger cross-fertilisation with other sector policies, to engage more fully with stakeholders and citizens, but traditional professional cultures around the technical top-down rigid approach to planning, and the silo mentality, are difficult to shift.

Is this experience of any value to China and in particular, flood risk management in the Great Bay Area? We must take great care in making comparisons, or in transposing solutions to places where conditions and cultures are very different and when ‘when concepts do not travel well across national boundaries’ (Nadin 2012, p. 3). There are similarities, particularly between the delta area of north-west Europe and the PRD. The experience of rapid urbanisation in the PRD is exceptional, but the characteristics of the two delta regions are similar. The challenges in the PRD are expressed in similar ways to those explained above for Europe. The goals of the Outline Development Plan for the Guangdong-Hong Kong-Macao Greater Bay Area 2019, have strong parallels with experience in Europe. The common challenges are to balance the economies and diseconomies of agglomeration, to reduce friction caused by border effects, to replace competition with complementarity and to overcome constitutional, legal and cultural differences in promoting development and planning holistically. Underlying these objectives is the tension between the great prosperity that agglomerations can deliver, whilst putting right the damage that has been done to natural environmental

systems and creating more adaptive environments to current and future challenges of flood risk.

We suggest there are three areas of European experience that will be of interest to China (Meng et al. 2021). First, there is clearly a role for a form of spatial planning with the core task of cross-fertilising sectoral policies that have some impact on flood risk alongside the common engineering approaches in the water management sector. This would include ensuring that economic investments, land-use regulation, transport infrastructure, environmental and agricultural and marine policies, among others, work in concert to support flood risk reduction. Second, all decision-making in sectoral departments would benefit from being informed by a common source of data, analysis and forecasting on flood hazards and the implications for urban and rural development. As noted above, it would also be advantageous if there was a common set of technical terminology across sectors. Third, there are many examples in Europe of the sorts of mechanisms that provide a platform for debate and joint deliberation in the policy and decision-making process, and which would promote more coherence between water management, spatial planning and other sector actions. This would need to be supported with measures to soften the hard boundaries of professional and departmental knowledge systems.

We raise these points in a modest way, and with a strong caveat. There is an acceptance in European governments that more cross-fertilisation is needed to tackle complexity, uncertainty and the potential long-term damage that can be done to vulnerable natural environmental systems by poor urban development, that in turn puts assets and people at risk. However, this point has been made many times over decades. It has taken a long time to see signs of change. Considerable encouragement and funding for inter-sectoral and cross-border collaboration may not reap substantial benefits when the underlying conditions that encourage competition are not changed. Also, sectoral policy makers in water management and economic development are powerful actors who are focused on the achievement of specific narrow objectives. They may have little incentive to collaborate and compromise. Above all, the dominant rational planning culture can put a break on efforts for reform. It is not enough to reform tools or procedures to encourage cooperation between those responsible for water management, urban planning and other sectors, without shifting the mindset of the practitioners and politicians. There needs to be an institutional and professional learning process that encourages effective dialogue in the interests of a more adaptive urban transformation.

Nevertheless, the challenge must be addressed. We have explained that whilst making and implementing policy in departmental silos has some advantages, there are significant costs especially in the way that sectoral policies play out in certain locations. This is especially true for flood risk management which obviously relies on a committed and coordinated response from many sectoral policies—water management and hydrological engineering, marine planning, economic development, transport and infrastructure development, agriculture and more. We have pointed to examples of the costs of non-coordination in north-west Europe. Vulnerability to flood risk and the need for better cross-fertilisation among policy sectors in the interests of good territorial governance are equally relevant in the Pearl River Delta.



Experience in Europe has demonstrated that progress can be made but that there are deep seated barriers, not least sectoral and professional cultures, and the rigidity of existing planning and design tools. The seven steps summarized above offer a starting point for debate about effective cross-fertilisation and stronger territorial governance in the interests of flood risk management.

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## References

- Asarpota K, Nadin V (2020) Energy strategies, the urban dimension, and spatial planning. *Energies* 13(14):3642. <https://doi.org/10.3390/en13143642>
- Balz V (2018) Regional design: discretionary approaches to regional planning in the Netherlands. *Plan Theory* 17(3):332–354. <https://doi.org/10.1177/1473095217721280>
- Barca F (2009) An agenda for a reformed cohesion policy: a place-based approach to meeting European Union challenges and expectations. European Commission, Brussels. [http://ec.europa.eu/regional\\_policy/policy/future/pdf/report\\_barca\\_v0306.pdf](http://ec.europa.eu/regional_policy/policy/future/pdf/report_barca_v0306.pdf)
- Candel JLL (2021) The expediency of policy integration. *Policy Stud* 42(4):346–361. <https://doi.org/10.1080/01442872.2019.1634191>
- Commission of the European Communities (CEC) (1997) The EU compendium of spatial planning systems and policies. Office for Official Publications of the European Communities, Luxembourg
- Committee on Spatial Development (CSD) (1999) European spatial development perspective: towards balanced and sustainable development of the territory of the European Union. European Commission, Brussels
- Dühr S, Colomb C, Nadin V (2010) European spatial planning and territorial cooperation. Routledge, London and New York
- Environment Agency (England) (2021) Long-term investment scenarios 2019, updated 2021. Environment Agency, Bristol. <https://www.gov.uk/government/publications/flood-and-coastal-risk-management-in-england-long-term-investment/long-term-investment-scenarios-ltis-2019>
- Ersoy A, Brand N, van Bueren E (2023) Adapting a systems perspective for cross-sector coordination: approaching flood resilience in Houston and Accra. *Planning Practice and Research*
- ESPON (2013) Territorial impact assessment of policies and EU directives. ESPON, Luxembourg. [https://www.espon.eu/sites/default/files/attachments/TIA\\_Printed\\_version.pdf](https://www.espon.eu/sites/default/files/attachments/TIA_Printed_version.pdf)
- European Commission (1998) Report on community policies and spatial planning: Working document of the commission services. CEC, Brussels
- European Commission (2021a) Territorial agenda 2030: a future for all places. Federal Ministry of the Interior, Building and Community, Germany. [https://ec.europa.eu/regional\\_policy/sources/docgener/brochure/territorial\\_agenda\\_2030\\_en.pdf](https://ec.europa.eu/regional_policy/sources/docgener/brochure/territorial_agenda_2030_en.pdf)
- European Commission (2021b) Forging a climate-resilient Europe: The new EU strategy on adaptation to climate change. Communication from the Commission, Brussels

- European Environment Agency (EEA) (2016) Flood risk in Europe: the long-term outlook. <https://www.eea.europa.eu/highlights/flood-risk-in-europe-2013>. Accessed 15 Dec 2021
- European Environment Agency (EEA) (2019) Copernicus land monitoring service. Thematic hotspot monitoring in coastal zones factsheet. EEA, Copenhagen
- European Environment Agency (EEA) (2021) Global and European sea level rise. EEA, Copenhagen. <https://www.eea.europa.eu/ims/global-and-european-sea-level-rise>
- European Observation Network for Territorial Development and Cohesion (ESPON) (2013) ESPON TANGO: Territorial approaches for new governance. Final report. ESPON
- Greater Bay Area Development Office (2019) Outline development plan for the Guangdong-Hong Kong-Macao greater bay area (Chinese Version and Courtesy Translation into English). GBAD, Hong Kong
- Healey P (2007) Urban complexity and spatial strategies: towards a relational planning for our times. Routledge, London
- Healey P (2010) Making better places: the planning project in the twenty-first century. Palgrave Macmillan, London
- Helm D (2016) Natural capital: valuing the planet. Yale University Press, New Haven
- Marks D (2015) The urban political ecology of the 2011 floods in Bangkok: the creation of uneven vulnerabilities. *Pac Aff* 88(3):623–651
- McGranahan G, Satterthwaite D (2014) Urbanisation concepts and trends. International Institute for Environment and Development Working Paper. IIED, London
- Meng M, Li W, Yan J, Nadin V (2021) Governing climate adaptation planning: integration between water management and spatial planning in the Netherlands. *Urban planning international* (in Chinese)
- Nadin V, Stead D (2008) European spatial planning systems, social models and learning. *Plan Rev* 44(172):35–47. <https://doi.org/10.1080/02513625.2008.10557001>
- Nadin V, Stead D, Dabrowski M, Fernández Maldonado AM (2020) Integrated, adaptive and participatory spatial planning: trends across Europe. *Reg Stud*. <https://doi.org/10.1080/00343404.2020.1817363>
- Nadin V, Fernández Maldonado AM, Zonneveld WAM, Stead D, Dąbrowski M, Piskorek K, Sarkar A, Schmitt P, Smas L, Cotella G, Janin Rivolin U, Solly A, Berisha E, Pede E, Seardo BM, Komornicki T, Goch K, Bednarek-Szczepańska M, Degórska B, Münter A (2018) COMPASS: comparative analysis of territorial governance and spatial planning systems in Europe. ESPON EGTC, Luxembourg
- Nadin V, Piskorek K, Balz VE, Zonneveld W, Muñoz Unceta P, Georgieva N, den Hoed W, Hermansons Z, Daly G (2021) ESPON policy brief: cross-fertilisation of cohesion policy and spatial planning. ESPON EGTC, Luxembourg
- Nadin V (2006) The role and scope of spatial planning: spatial plans in practice: literature review summary. Communities and Local Government, London. <http://www.communities.gov.uk/index.asp?id=1504896>
- Nadin V (2012) International Comparative Planning Methodology: Introduction to the Theme Issue *Planning Practice and Research* 27(1):1–5. <https://doi.org/10.1080/02697459.2012.669928>
- Nicholls RJ, Hanson S, Herweijer C, Patmore N, Hallegatte S, Corfee-Morlot J, Chateau J, Muir-Wood R (2007) Ranking of the world's cities most exposed to coastal flooding today and in the future. OECD, Paris
- North-west Metropolitan Area Spatial Vision Group (NWMA) (2000) A spatial vision for north-west Europe. VROM, The Hague
- Nuissl H, Siedentop S (2021) Urbanisation and land use change. In: Weith T, Barkmann T, Gaasch N, Rogga S, Strauss C, Zscheischler J (eds) Sustainable land management in a European context: human-environment interactions, vol 8. Springer. [https://doi.org/10.1007/978-3-030-50841-8\\_5](https://doi.org/10.1007/978-3-030-50841-8_5)
- Peters BG (2018) The challenge of policy coordination. *Policy Des Pract* 1(1):1–11. <https://doi.org/10.1080/25741292.2018.1437946>
- Rauws WS, Cook M, Van Dijk T (2014) How to make development plans suitable for volatile contexts. *Plan Pract Res* 29(2):133–151. <https://doi.org/10.1080/02697459.2013.872902>

- Robert J, Stumm T, De Vet JM, Reincke GJ, Hollanders M, Figueiredo MA (2001) Spatial impacts of community policies and the costs of non-coordination: study carried out at the request of the directorate-general 'regional policy' European commission. European Commission, Brussels. [https://ec.europa.eu/regional\\_policy/sources/docgener/studies/pdf/spatial\\_en.pdf](https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/spatial_en.pdf)
- Schmitt P, Van Well L (2016) Territorial governance across Europe: pathways, practices and prospects. Routledge, Abingdon
- Schmitt P, Wiechmann T (2018) Unpacking spatial planning as the governance of place. *Disp* 54(4):21–33
- Seto KC, Dhakal S, Bigio A, Blanco H, Delgado GC, Dewar D, McMahon J (2014) Human settlements, infrastructure and spatial planning: in mitigation of climate change. Contribution of working group III to the fifth assessment report of the intergovernmental panel on climate change. Cambridge University Press
- Skrimizea E, Haniotou H, Parra C (2019) On the 'complexity turn' in planning: an adaptive rationale to navigate spaces and times of uncertainty. *Plan Theor* 18(1):122–142. <https://doi.org/10.1177/1473095218780515>
- Spatial Foresight (2020) The Territorial Analysis of the NWE Cooperation Area, Thematic Analysis. Interreg North-west Managing Authority, Lille, France
- Stead D, Nadin V (2008) Spatial planning: key instrument for development and effective governance. United Nations Economic Commission for Europe (with Dominic Stead), Geneva. [http://www.unece.org/hlm/prgm/urbanenvperf/Publications/spatial\\_planning.pdf](http://www.unece.org/hlm/prgm/urbanenvperf/Publications/spatial_planning.pdf)
- World Meteorological Society (WMO) (2019) Greenhouse gas bulletin. <https://public.wmo.int/en/media/press-release/greenhouse-gas-concentrations-atmosphere-reach-yet-another-high>
- Zandvoort M, Van der Vlist MJ, Klijn F, Van den Brink A (2018) Navigating amid uncertainty in spatial planning. *Plan Theor* 17(1):96–116. <https://doi.org/10.1177/1473095216684530>

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