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Management of sustainability transitions through planning in shrinking resource city contexts: an evaluation of Yubari City, Japan

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Abstract

This paper evaluates the planning competences required to enact a managed transition to sustainability at the municipal level for cities facing population, economic and employment decline. Drawing on the 'shrinking cities' literature, we argue consolidation of the built environment can become a focal point for sustaining citizen welfare when transitioning cities facing decline, especially those previously reliant on resource industries. We evaluate the former coal-mining town of Yubari, Japan, which is developing a consolidated urban form with the aim of creating a 'sustainable' future city. Findings from interviews and content analysis of Yubari's planning policy indicate, however, that to translate 'shrinking' a city into a managed transition, spatial planning must be accompanied by a wider range of social policy measures

and strong cross-sectoral engagement. We also caution that the unique geographical and political context of Yubari mean its model may not be directly replicable in other contexts.

Keywords

managed transition; shrinking cities; sustainability; urban planning; Yubari.

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1. Introduction

1.1 Shrinking cities and managed transitions

The question of how to manage 'shrinking cities' – cities experiencing reductions in population, employment and/or economic base – has gained significant attention within planning scholarship (e.g. Hollander et al, 2009; Martinez-Fernandez et al, 2012; Pallagst et al, 2017). Such shrinking cities are argued to raise specific challenges for planners and municipal policymakers, including: abundance rather than limitation of greenspace; inadequate income options; disproportionate loss of more advantaged households; underutilised infrastructure; de-densification and abandonment; social fragmentation; and pollution and built environment legacies (Herrmann et al, 2016; Galster, 2017). These issues are particularly acute in cities developed around now-depleted or declining natural resources (e.g. coal mining). Extractive activity leaves physical legacy such as infrastructure or pollution in the built environment which must be managed and/or remediated (Martinez-Fernandez and Wu, 2009). However, resource extraction may also leave cultural, political and psychological legacy such as unwillingness among municipal governments to accept the need to manage decline (Schatz, 2017); reluctance to reflect on environmental implications of extraction due to local economic dependency (Milnes and Haney, 2017); continued and unwarranted focus on developing large-scale infrastructure (He et al, 2017); the need for governors to pick up the aftermath of actions and developments undertaken by private-sector operators (Martinez-Fernandez et al, 2012); and inequality and deprivation exacerbated by uneven distribution of high incomes from extraction-related employment (Reeson et al, 2012).

Planning is a crucial response to challenges raised by shrinking cities, especially the reorientation of development trajectories towards acceptance and management of decline and the adaptation and reduction of infrastructure (Pallagst et al, 2017). Hollander et al (2009: 232) note "planners can play an instrumental role in exploring alternatives to stabilise transitional cities and neighbourhoods, and point the way to a more sustainable future." Weaver et al (2016) define such sustainability in the shrinking cities context as the ability of a city to produce new adaptive capacity and retain the qualities that make it successful in the face of new more diverse disturbances (i.e. becoming more 'resilient' to pressures), adapting and self-organising to maintain its functions into the future. Weaver et al contend that the three bases of ecology, equity and economy remain relevant in a shrinking cities context. Ecologically, reorganisation and consolidation of urban form may address environmental issues in the built environment such as biodiversity and ecosystem services conservation, by providing an opportunity to enhance or implement urban greenspace (Mulligan, 2014; Haase et al, 2014). For equity, the process of 'shrinking' a city may open a window to undertake actions aimed at redressing existing inequalities in municipal-level governance by targeting interventions in previously marginalised areas (Horst et al, 2017), or empowering citizens in the planning and governance of the local environment and hence enhancing social capital (Rocak et al, 2016). Managed shrinkage may also facilitate reflection on what constitutes 'sustainable' economic practice in the aftermath of activity often dominated by one private-sector industry (Newbury and Gibson, 2014) or give space to provide new opportunities and redistribute resources to current citizens (Weaver et al, 2016).

Responding to the challenges raised by a shrinking city hence requires technical, social and policy actions. Yet land use reconfiguration – particularly consolidation of the built environment – is a central pillar of helping distressed and shrinking cities transition to

sustainable urban environments (Mallach, 2011; Burkholder, 2012). A consolidated urban form may maintain quality of life for residents by creating an urban size and form that is manageable to a municipal government working with a reduced resource base. The purpose of this paper is therefore to evaluate the planning competences required at a municipal level in a shrinking resource city context to turn 'decline' into a 'managed transition' towards the kind of sustainable urban form outlined above, with a particular focus on land use and spatial planning.

1.2. Evaluating sustainability in a shrinking cities context

The challenge of transitioning cities to sustainable and/or resilient forms is of course well known. It is therefore not surprising to find numerous frameworks to understand the anatomy of such transitions, a selection of which are summarised in Table 1. This is not intended to be exhaustive, rather is merely to illustrate the breadth of ways in which urban 'sustainability' may be evaluated and the range of areas which may be assessed.

Insert Table 1 near here: Indicative evaluative frameworks, areas of evaluation and aims

Given the specific issues raised in Section 1.1. relating to imagining a 'sustainable' future in a declining resource-based city (Herrmann et al, 2016), it is worthwhile reflecting on what is required to turn consolidation of the built environment into a managed transition to sustainability. Four issues guide our thinking. One is the identification of governance and planning as a key driver of change, both in the shrinking cities literature (Hollander et al, 2009) and also wider urban sustainability thinking (McCormack et al, 2013). Second is the importance of land use not only in a shrinking city context (Mallach, 2011; Burkholder, 2012) but also as vehicle for practically addressing normative issues around social equality, which

can have a strong spatial component (Shih and Mabon, 2017). Third is the significance, in situations of high political sensitivity and limited will, of individuals and small groups in initiating and sustaining change – both for decline-oriented planning in shrinking cities (Schatz et al, 2017) and more generally moving sustainability agendas forwards in the face of socio-economic development pressure (Leck and Roberts, 2015). Fourth and final is the increasingly transdisciplinary nature of sustainability governance, which requires decision-makers to synthesise a breadth of knowledges to respond to complex social and environmental issues (Lang et al, 2012).

This indicates that not only urban planning, but crucially the people who enact it, are key for putting sustainable shrinking cities into practice. We thus focus our analysis on the competences of planners and governors at the municipal level to address sustainability issues in a shrinking cities context. Given the breadth of technical, social and political issues identified so far in this paper, holistic assessment of the different *kinds* of competence required across topics and sectors for sustainability planning of the kind Wiek et al's (2013) five-competence framework facilitates (elaborated in Section 3.3.) seems appropriate. We use the Wiek et al framework not as a 'checklist' of what may make planning sustainable or otherwise, but as a starting point for a discussion on the specific challenges raised in a shrinking/resource city context for sustaining city functions into the future. Nevertheless, the dimensions identified by Wiek et al do draw in those of other frameworks. Anticipatory competence reflects the urban sustainability foresight seen in Wolfram (2016) and the Luederitz et al (2017) dimensions of outcomes and outputs; strategic competence parallels McCormack et al's (2013) interest in governance and planning and innovation and competitiveness; systems thinking competence uses the same language as Tyler and Moench's (2012) focus on systems and Mieg's (2012) interest in ability to identify social and natural resources across scales; and interpersonal

competence relates to Luderitz et al (2017) on processes and Rosemborg (2015) on social dialogue. In light of the prominence of social sustainability in shrinking cities contexts and questions of who ought not to be left behind as a resource city transitions (e.g. Newbury and Gibson, 2014; Rocak et al, 2016; Horst et al, 2017), the explicit consideration in Wiek et al's framework of normative competence is of value.

We assess the significance of these competences in a shrinking resource city context through the case study of Yubari City in Hokkaido, northern Japan. This is former mining city which has made consolidation of the built environment a key part of its goal of "building a sustainable community that values Yubari's history and natural environment" (Yubari City, 2012a: 7). What is significant about Yubari is that its activities come at the most advanced end of Pallagst et al's (2017) schematic of shrinking cities, in that there is acceptance of decline; planning for decline by the municipal government; and according adaptation and reduction of infrastructure. It is also noticeable that Yubari City places significant emphasis on 'sustainable' (持続的) urbanisation in its planning policy. Yubari thus illustrates how (a) an unplanned decline in a city's resource base has clear spatial implications on the urban environment; and (b) urban planning can shape a transition to a form that can maintain a city's functions into the future when considered within a wider range of policy measures.

2. Case study: Yubari City

Yubari City is located in Sorachi Subprefecture in Hokkaido, the northernmost island of Japan (see Figure 1). Its population was recorded in 2017 as 8,376 (Yubari City, 2018), compared to a peak of 116,980 in 1960 (Yubari City, 2011). Depopulation was greatly hastened by the decline of the coal industry that formed Yubari's economic base, the working population

leaving as mining operations were scaled back until the final closure in 1990 (Yubari City, 2012a). Due to ongoing population aging and decline (Culter, 1999), the failure of the municipality to effectively replace coal in the city economy (Irish, 2009), and loss of a tax revenue plus weak governance (Seaton, 2010), Yubari was made a financial restructuring organisation - essentially declaring bankruptcy - by 2007. The city was declared a financial regeneration organisation in 2010, and is expected to continue debt repayment until 2027 (Yubari City, 2017a).

Insert Figure 1 near here: Location of Yubari City in Hokkaido (Adapted from map tiles by Stamen Design, under CC BY 3.0. Data by CartoDB and OpenStreetMap, under ODbL)

Despite the financial situation, Yubari City has had to continue maintaining infrastructure (e.g. city hall, hospitals, schools) spread over a wide area (see Figure 2) and designed for a much larger population (Martinez-Fernandez et al, 2012; Yubari City, 2012a). In Japan, municipalities such as Yubari are responsible for actions relating to citizens' daily living, among them city planning and social welfare, under tax revenues allocated by central government (Nakagawa, 2016) For environmental, climate and sustainability issues, municipalities like Yubari have largely been expected to enact national-level goals, arguably with limited guidance or financial support to do so (Sugiyama and Takeuchi, 2008). However, this does mean municipalities have freedom within this to develop spatial responses to environmental challenges in a manner they deem appropriate to the locale. This has resulted, for example, in cases where municipalities have produced stronger climate change action plans than those of the national level (Schreuers, 2008). Indeed, Yubari City has itself made spatial planning central to its future city vision, with the adoption of the Yubari City Urban Planning Masterplan (YCUPM) in 2012. The YCUPM uses urban planning to address four challenges

facing Yubari: 1) an ageing and declining population; 2) making most efficient use of existing stock and future land resources; 3) consolidating the urban area to create a sustainable community; and 4) building connection and cooperation across the wider area (Yubari City, 2012b). More specifically, Yubari City defines its goal for a 'sustainable' local society as "living happily in peace […] looking after Yubari's cultural heritage and natural environment" (Yubari City, 2012a: 5). The 'sustainability' Yubari is aiming to transition to is thus primarily to an urban form within which citizens' quality of life may continue.

Insert Figure 2 near here: Main planning districts of Yubari City (Adapted from map tiles by Stamen Design, under CC BY 3.0. Data by CartoDB and OpenStreetMap, under ODbL; and from Yubari City (2012b))

It is the third action - consolidating the urban area or physically 'shrinking' the city – that has gathered the most attention in Yubari, both through journalism (e.g. Hendy, 2014; Hagiwara and Mogi, 2016) and also academic evaluation (Martinez-Fernandez et al, 2012; Setoguchi, 2014; Setoguchi et al, 2016). In this paper, however, we seek to go further and take up the challenge of Mallach (2011) to consider the role that land use and spatial planning can play in turning this 'shrinkage' into a managed transition towards a more sustainable future for cities facing complex and conflicting social, economic and environmental sustainability challenges. As Section 1 demonstrates, major demographic change, decline of economic base, and stretched municipal resources are not unique to Yubari and have been widely studied elsewhere. However, systematic critical evaluation of the YCUPM through the lens of sustainability (and the competences required to attain sustainability) may build on existing 'shrinking cities' thinking and more explicitly consider the role of spatial planning in managed

transitions at the urban scale which balance socio-economic issues and environmental imperatives.

3. Method

3.1. Policy analysis

The main documents analysed were the 52-page Yubari City Urban Planning Masterplan Main Document (Yubari City, 2012a), 107-page Supporting Material (Yubari City, 2012b), and 6-page Overview (Yubari City, 2012c). The Main Document lays out the future urban configuration of Yubari and the main policies and actions through which this will be achieved, so aids evaluation of the linkage between urban planning, shrinking cities and a managed transition to sustainability. The Supporting Material provides information on the process through which the YCUPM was developed, including minutes of committee meetings and public consultations as well as demographic data and survey results, and so gives insight into the wider social context in which the policy emerged. The Overview is a graphical summary of the YCUPM for a non-specialist audience, and hence demonstrates how urban planning in Yubari is justified and communicated to citizens on whose support the measures depend. Each document was coded according to the competences described in Section 3.3. This in-depth analysis was supported by review of other relevant documentation produced by Yubari City (e.g. the Third Yubari City Climate Change Action Plan (Yubari City, 2014)), relevant academic papers (e.g. Setoguchi, 2014) and media reporting of planning in Yubari to give broader contextual understanding of the landscape in which Yubari's urban planning takes place.

3.2. Interviews

In-depth interviews were conducted by the lead author with twelve people (see Table 1). As the aim of the interviews was to understand in-depth the specifics of the consolidation process in Yubari and also the social, economic and environmental pressures faced in the Hokkaido region more widely, a small focused sample of participants able to explain issues in depth was considered more valuable than a larger sample with more limited knowledge. Sampling and recruitment was focused on individuals and organisations with central roles in putting Yubari's vision into practice, with respondents identified and approached based on reading of the YCUPM to identify key actors. Yubari City's planning division, academics involved in drafting the YCUPM, and citizens involved in delivering city functions post-restructuring were identified as particularly important, as were regional development and environment policymakers setting the wider context in Hokkaido within which Yubari's actions occur. Samples of comparable size, when combined with systematic policy analysis, have been used elsewhere in urban planning research (e.g. Schatz, 2017; Shih and Mabon, 2017).

Insert Table 2 near here: Summary of interviews

The interviews were semi-structured, using open-ended questions with the aim of allowing interviewees to focus on issues they themselves saw as being most important in Yubari and Hokkaido instead of imposing a rigid interpretative framework from the outset. This also aided the collection of richer data by helping to build rapport with interviewees who were key informants and sources of in-depth contextual information, with interviews ranging from 1 hour to 90 minutes. Each interview nonetheless sought to cover (a) the social and demographic situation in Yubari and Hokkaido more generally; (b) energy and climate issues; (c)

environmental quality and challenges more broadly; and (d) planning for the future in response to social and environmental pressures. The interviewer prepared prompts for each of these topics, then followed up by probing further in response to what the interviewees said. The interviews were then analysed by coding for the competences described in Section 3.3.

3.3. Analytical framework

As outlined in Section 1.2., the key competences in sustainability developed by Wiek et al (2011) were used to provide a semi-systematic analysis of the Yubari consolidation policy and planning process. For the purposes of analysis, 'sustainability' was taken to mean Yubari's own definition of a sustainable future (maintaining quality of life for citizens within the city whilst preserving cultural heritage and natural environments), and also the Weaver et al (2016) definition of ability to adapt and maintain functions into the future across ecology, economy and equity. As such, what was being assessed was the competences of the urban planners in Yubari to articulate and work towards a vision for sustainability in Yubari, and the lessons this may yield for enacting sustainability transitions in other shrinking cities contexts. Accordingly, interviews and main policy documents were coded for statements demonstrating each of the key Wiek et al competences in relation to a 'sustainable' Yubari, as per Table 3.

Insert Table 3 here: Competences for data analysis

To avoid slippage in meaning between data collection and analysis, research progressed as far as possible in the language in which the data was created. Analysis of both the municipal plans and interviews was hence undertaken on the original Japanese data. Indicative extracts demonstrating key themes were then translated into English once the analysis was completed.

Both members of the research team are proficient in Japanese. Translations were however double-checked for accuracy with a native Japanese speaker independent from the research project.

4. Findings

4.1. Anticipatory competence - planning policy

Wiek et al (2011: 207) define anticipatory competence as the ability to "craft rich 'pictures' of the future" and envision future scenarios. As a vehicle for the realisation of the entire future city vision, spatial planning helps to enact this anticipatory competence in Yubari.

This is facilitated by a policy structure that puts urban planning at the core of Yubari's actions for developing a sustainable city. The city's main planning policy is the Yubari City Urban Planning Masterplan (YCUPM). This is directly linked (through the overall city plan) to the financial regeneration plan, which guides Yubari's rehabilitation following the 2010 financial regeneration order. The YCUPM in turn filters into other municipal sectors (e.g. health and social welfare; environment), and informs sub-areas such as social housing and disaster prevention (Yubari City, 2012a). Underneath the overall Yubari urban plan, separate spatial plans are also created for each of the five districts shown in Figure 2.

In short, reconfiguration of the built environment is directly linked to policy decisions around the future of Yubari - especially the dominant issue of rehabilitation and restart. The importance of the spatial to visioning Yubari's future becomes clear if one considers the city

characteristics. When asked to describe the city's current challenges, interviewee responses included:

> *Yubari is like a long thin city with branches. On the branches there are rural areas, the area is different, completely different, even though it's the same city. There was hardly any exchange, so all the areas developed differently. Today it's different, the population has reduced to one tenth. Nanbu and this area, Honcho, were completely different.* (NPO volunteer, female, Yubari City)

> *Here there is still a district where there was coal mining, here there was coal mining, here there was also coal mining* [...] *At the moment there are still some districts left over, there are few people but the district itself remains. So because of that drinking water has to be provided, when snow falls it has to be cleared, these are things that the municipality has to do.* (city planner, male, Yubari City)

Yubari's physical and built environments exacerbate underlying social problems of population ageing and decline. The initial urbanisation pattern due to the location of coal deposits and the subsequent nature of industrial and population decline have left a fragmented and scattered population (Seaton, 2010), stretching municipal resources over a large area and reducing the city's ability to maintain social wellbeing and indeed the functioning of the city overall. It is therefore not surprising that the municipality sees urban planning as the foundation for a

sustainable society, specifically consolidation of the city's population and infrastructure under a 'compact city' philosophy[1].

Consolidation – the basis of the YCUPM – entails creation of a new 'core' in Yubari's Shimizusawa District where housing for both elderly and younger residents is being constructed, and where medical and administrative facilities will eventually be moved from their present locations across the municipality (Yubari City, 2012a). Remarkable in how this future vision is presented is the explicit acknowledgment in the public-facing planning information that some built-up areas will undergo a process of managed decline – and that people will be encouraged to resettle - to create an environment across which the municipality's responsibilities can sustainably be delivered:

> *At the same time as guiding people to move to the city core where everyday living convenience is high, based on the issues and characteristics of the different districts we aim to create a form in each district where people can live peacefully*. (Yubari City, 2012c: 3)

This is supported in the YCUPM by maps showing a 20-year vision, indicated by arrows, to consolidate existing stock and move the other four districts of Honcho-Wakana; Nanbu; Numanosawa; and Momijiyama towards a north-south spine around the Shimizusawa core (Yubari City, 2012c). Built environment configuration is therefore central to anticipatory competence in Yubari, particularly the explicit recognition that geographical and historical

[1] 'Compact city' (コンパクト・シティ) is the term Yubari's planners themselves use to describe consolidation (Yubari City, 2012a). This is distinct from the way 'compact city' is normally used in planning as a means of managing sprawl.

characteristics of Yubari mean some areas require managed decline to attain sustainability for the city overall. In the rest of this section, we assess the processes through which these reorganization plans are developed and enacted.

4.2. Strategic competence - cross-sectoral governance

Strategic competence refers to the ability to collectively design and implement sustainability transitions – that is, *how* transitions happen (Wiek et al, 2011). In this regard, the YCUPM calls for greater external involvement in the compact city process:

> *Until now, urban planning in Yubari has been led largely by the municipality* […] *As the population continues to age and decline, the area's problems become more complicated and the municipality becomes limited in how much it alone can solve problems and progress urban planning. Therefore, to realize the Yubari City Urban Planning Master Plan, citizens, the private sector, NPOs, civil society organisations and the municipality need to move towards a shared vision and direction for future urban planning with responsibilities allocated to each.* (Yubari City, 2012a: 45)

This shift towards cross-sector collaboration is reflected in the makeup of the Masterplan Formulation Committee, which as well as representation across the municipal government (e.g. fire brigade, health and social welfare; water board) has named representatives from farming, tourism, commerce and publicly-recruited citizens among others. The YCUPM justifies cooperative planning through need to integrate different knowledges to tackle complex problems. Bringing a wide range of groups together at the outset of the planning process, when there is opportunity to collaboratively develop planning ideas with fewer constraints, is indeed

argued to create more optimal solutions (van Dijk and Ubels, 2016). However, when asked about the role of developers in delivering the city vision, a city planner was more pragmatic:

> *Without the power of private enterprise, we wouldn't be able to build new housing* [...] *Even though land is cheap, it is expensive to build, several million Yen, and it is a risk as you don't know if people will come. But to encourage developers, the municipality will support part of the cost* […] *This is why we have these private apartments. Young people won't live in an apartment unless it is trendy and well-designed, there are lots of people who don't want to live in the housing the municipality constructs* (city planner, male, Yubari City)

Private sector developers are hence crucial to Yubari's functioning by (a) constructing required housing stock that the municipality itself does not have resources to produce; and (b) having the finance and flexibility to create a built environment in which younger people – vital for Yubari's longer-term prospects – will want to live. Such pragmatism was also expressed by citizens who - whilst proud of their achievements and happy to support the municipality - were under no illusion as to why citizen participation in Yubari was ultimately necessary:

> *Even if the town is no good, we can sit down, meet and think 'why don't we do* [activities such as festivals] *once more?' In this way we can see strength [laughs] Everyone in the town thinks positively and does things like that. The municipality can't do everything, so recovery is by citizens* […] *At the moment the city government doesn't have money to give out. Trying hard like this is the temperament of the Yubari people! [laughs]* (NPO volunteer, male, Yubari City)

The ‘typical’ characteristics of Yubari people are viewed by citizens themselves as advantageous for the future of the city, filling gaps in provision of cultural services the municipality cannot afford. Although proud of these characteristics, interviewees also recognised these traits are somehow necessary to sustain Yubari. Martinez-Fernandez et al (2012) likewise assess Yubari citizen collaboration with the municipality as a self-help strategy to ensure the survival of the community. Indeed, actions listed in the YCUPM as being undertaken by civil society from now into the future include snow clearing, the planting of cherry blossom trees, and the preservation of cultural heritage (Yubari City, 2012a).

Strategic competence in Yubari's urban planning is thus characterised by pragmatic recognition of where the municipality's financial limitations lie, and the importance of external actors - including private developers and citizens - in delivering and sustaining the consolidated city vision. The unique financial situation in Yubari - and (for now at least) the fact that low prices and a declining population mean a lack of opportunities for developer profiteering - mean public-private partnerships and citizen 'resilience', criticised in other sustainability contexts (e.g. Jou et al, 2016; Lockie, 2016), may actually deliver benefit to citizens in Yubari in a way purely municipal-led activity cannot. However, given concerns in the wider literature, caution must be exercised to ensure developer power is kept in check and municipal responsibilities maintained if Yubari City’s aim of living quality for its citizens is sustained into the future.

4.3. Systems thinking competence - social and ecological systems

Systems thinking is defined by Wiek et al (2011: 207) as “ability to collectively analyse complex systems across different domains […] and across different scales” to develop transition processes. In Yubari, municipal technical knowledge is supported on the Masterplan

Formation Committee by the academic (Tsuyoshi Setoguchi of Hokkaido University, and Hirofumi Matsumura of the Hokkaido Northern Regional Building Research Institute) and the private sector (construction consultants Docon) expertise (Yubari City, 2012b). The fact these experts are locally-situated (Setoguchi and Docon in Sapporo, Matsumura in Asahikawa) indicates high-level recognition of systems thinking in the YCUPM, drawing in expertise in social, economic and built environment systems that is nonetheless familiar with the Yubari context.

The extent to which this thinking extends to socio-ecological systems is however less apparent. Individually at least, city planners demonstrate socio-ecological systems thinking - as illustrated by an interviewee when probed first on climate change and then environmental issues more generally:

> *CO_2, you mean? Up until now we haven't really had that concern. There is a lot of nature here, lots of green and trees, so I think we produce oxygen rather than CO_2 [...] There are lots of hilly areas, so there is a risk of landslides during rain [...] Disaster prevention of course needs money, but this area is very wide and there are areas we don't need to worry about protecting. So from the perspective of disaster prevention, we can say to people not to live there, that's why it's a good idea to move everyone to a central area.* (city planner, male, Yubari City)

On one hand, this illustrates awareness among planners - and within the YCUPM itself - that spatial reorganisation can reduce risk from natural hazards. It provides an opportunity to move people away from areas of high exposure, thus allowing reduction in municipal disaster prevention expenditure. However, at the level of policy rather than individuals, socio-

ecological systems within the YCUPM remain framed as 'disaster prevention' and 'nature conservation,' reducing flood/landslide risk and preserving spoil tips (Yubari City, 2012a). Indeed, the only explicit mention of climate change in the YCUPM comes in a footnote:

> *Creating a low-carbon city: urban planning that comprehensively promotes countermeasures for the urban area through encouragement of focused urban development; the use of renewable energy; and preservation of green spaces etc in response to climate change issues* (Yubari City, 2012a: 8)

Few specifics are given as to how this may be attained, referring only to "prioritising public transport use and eco-driving", "thorough recycling and waste sorting", and "participation in environmental education etc" (Yubari City, 2012a: 47). An environmental NGO chief, questioned on the particular challenges of climate change governance in Hokkaido, suggested this reflects wider concerns about municipal planning in the region:

> *There is nothing that is especially difficult because of the fact it is Hokkaido. But what is disappointing is that the people we would like to take action, business owners, municipal leaders, people like that who are in a position to lead, lots of them are not yet aware.* (environmental NGO chief, male, Sapporo)

It may be unfair to be overly critical of the limited attention the YCUPM gives to climate change, given the urgent social issues and severe staffing and resource constraints faced by the municipality. Interviewed planners did state they are currently working to better understand the CO_2 reductions a consolidated urban form facilitates, and acknowledged landslide and snow risks could intensify with climate change. Nonetheless, as per Section 2, whilst perhaps

constrained in terms of technical guidance and financial support, municipalities in Japan do have power to plan climate change responses as they deem appropriate. The significance of addressing ecological dimensions – and increasingly climate issues - to attaining sustainability in shrinking cities is indeed highlighted elsewhere (e.g. Haase et al, 2014). A truly 'managed' transition to sustainability for Yubari may therefore require further development of the socio-ecological systems thinking competences that are already evident, building on disaster prevention and nature conservation thinking to consider climate change more systematically in future YCUPM iterations.

4.4. Interpersonal competence - public engagement

Interpersonal competence - ability to facilitate collaborative problem solving (Wiek et al, 2011) - is especially important in Yubari. Prior to YCUPM development, residents had negative experience with the municipality's top-down attempts at regeneration in Yubari, when attempts to improve the aesthetic quality of the built environment led to the removal of culturally meaningful mining landmarks (Irish, 2009). Community response to the compact city was characterised by a resident, when probed for his view, thus:

> *There are both negative and positive opinions among the population, but to Yubari that kind of plan is something that is needed. When we think about the efficiency of Yubari, then I can see that that kind of plan is necessary. Personally my opinion is neither for nor against.* (NPO volunteer, male, Yubari City)

This reflects extant research (Setoguchi, 2014; Setoguchi et al, 2016) indicating a cautious response thus far to the compact city among the Yubari public. However, that the municipality

was able to garner even qualified citizen support for such far-reaching spatial reforms warrants attention. We draw out three illustrations of interpersonal competence in this regard.

First is early recognition from the Masterplan Formation Committee about the importance of sensitive citizen engagement, as summed up by a comment from a member in minutes from an early committee meeting:

> *It is important that the residents' side raises suggestions about the measures needed to keep living in Yubari. If we propose plans like housing for the elderly from the top-down, residents are not likely to accept them* (Yubari City, 2012b: 99)

In response, citizen input was sought prior to masterplan drafting. A sample of residents were surveyed face-to-face to understand lifestyle issues that planning needed to address. A public consideration meeting of the YCUPM draft was then held, with concomitant consultations in Yubari City's five focus districts. A public comment period was subsequently opened, with comments incorporated into the YCUPM prior to its finalisation (Yubari City, 2012b). Citizens were also represented throughout formal planning discussions by four citizen members on the Masterplan Formation Committee.

Second is the range of options with which citizens were presented during consultation. Hokkaido University researchers produced five 'patterns' based on input received across the public engagement process (Yubari City, 2012b). These scenarios laid out different possible types/levels of consolidation, plus the option to simply maintain the status quo, and were refined through dialogue with residents to develop the final compact city plan (Setoguchi, 2014). Using these scenarios as a stimulus - and including the option to do nothing - may have

helped compact city planning to overcome regular criticisms (e.g. Healey, 1996) of urban planning consultation as a 'done deal' where citizen participation has little to no effect.

Third is the small-scale interpersonal nature of crucial discussions, and the role of trust-building. Local Hokkaido University staff and students worked alongside Yubari City to liaise with citizens and the municipal government, collecting citizen concerns and helping to explain planning decisions. Interviewed academics and planners both emphasised the dialogic nature of this work:

> *[We] did individual interviews on the future shape of Yubari with about 100 residents, and held many symposia where we heard residents' opinions. In the symposia we didn't just listen to residents' opinions, but also showed our opinion on how the ideal compact city should be*. (academic/practitioner, male, Hokkaido)

> *We got citizens together, if they had concerns or complaints we explained directly, and after that we negotiated with people individually. There are houses here, here, here, here [points at map]. One here, one here, one here. We can't sustain looking after each of these individually, could you possibly move here, could you possibly move here?* [...] *We build new houses here, and can then say 'why don't you move to here'?* (city planner, male, Yubari City)

The value of interaction at the individual level in getting buy-in for what has the potential to be a contentious spatial planning decision is notable. Interpersonal contact may defuse conflict, allowing citizen concerns to be addressed through one-to-one dialogue and giving opportunity to explain planning decisions in a less confrontational atmosphere than a large public meeting

(after Escobar, 2013). New housing also gives residents a clear benefit and incentive to support relocation and consolidation politics.

As seen across the shrinking cities literature, the topic of managed decline may be unpopular or contentious. What is interesting about Yubari, though, is that such decisions appear supported by citizens at least partly as a result of planners' interpersonal competences. It is also noteworthy that the municipality has put citizen welfare, as opposed to economic growth, first in its planning policies. This question of in whose interest planning in a transitioning shrinking city is undertaken is our last evaluation point.

4.5. Normative competence - political sensitivity

We lastly assess the relationship between spatial planning and normative competence – the ability to understand and negotiate the more value-laden questions around the future development of complex systems (Wiek et al, 2011). Demonstrating normative competence hence means being able to address, within the planning process, questions about what an *appropriate* future is for Yubari. What is especially challenging for the YCUPM is that there is in Hokkaido a long history of differing opinions on what this appropriate future should be. As narrated by a regional development association representative when asked to characterise regional planning:

> *In Hokkaido, labour unions are usually closely connected to the socialist parties, the liberal parties. They are basically against any policies the more conservative parties have. So from that position, they can't say they support something just because it creates jobs [...] There was lots of coal mining in Hokkaido, right? When coal mining was*

> *happening, it became unionised [...] Because of that, when it came to environmental protection versus development, jobs, employment were of secondary importance* (development organisation representative, male, Sapporo)

Although coal mining has ceased in Yubari, this illustrates how different value positions can be a barrier to getting agreement or support for planning decisions in Hokkaido, even for outcomes potentially beneficial to all. It is thus significant that the YCUPM appears to have sidestepped these politicised debates, as evidenced by the plan being passed by the Yubari City Planning Council in March 2012 and adopted as municipal policy one month later (Yubari City, 2017b). This may be in part due to the effective mechanisms for engaging different viewpoints early on in the process discussed in Sections 4.2. and 4.4. It may, however, also be a product of the rationale and framing behind the plan. The YCUPM is rationalised thus:

> *Under this severe financial situation, the large burden of sustaining the maintenance of infrastructure intended for the larger previous population and supporting the lives of people spread over a large area has begun to affect the lives of citizens.* (Yubari City 2012a: 5)

And a practitioner-academic, when asked to explain the motivations driving the YCUPM forward, responded:

> *Keeping young people living in Yubari is the most important strategy for the city. In the new core which is being planned at the moment, we are planning a nursery care facility for babies and a small library for kids so that it can be easier to raise children* […] *our*

> *urban planning is not solving problems, we are always discussing* hope *for the future of Yubari City* (academic/practitioner, male, Hokkaido)

Urban consolidation is thus framed as the starting point for discussions on a positive future for Yubari, with a particular emphasis on youth. Especially significant here is that shrinkage is *not* framed in terms of decline, but rather in terms of 'restarting' for the future – as evidenced by the *Restart: Challenge More* campaign launched by the municipality in spring 2017, featuring a strong emphasis on young people in the city (Yubari City, 2017c). Clearly material produced by the municipality must be treated with healthy scepticism. Yet there is within this a basic imperative that the benefits of the compact city accrue first and foremost to citizens' daily lives, by allowing better delivery of public services (e.g. transportation, healthcare), support for community relations, providing quality housing stock over a more compact area, and preventing the need for young people to move away. This focus on prioritising quality of life for the most vulnerable fits well with the equity and social dimensions of sustainability for shrinking cities reviewed in Section 1.1.

The YCUPM is positioned as a vital first step towards an appropriate future for Yubari, rather than an end goal. The emphasis on citizen wellbeing and sustaining the city's existence gives a broad-based rationale for planning decisions which a wide range of actors may engage with. This in turn perhaps avoids historical challenges around 'political football' outlined above. As explained by an interviewed planner-academic, physical deterioration of the built environment and tangible decline in living quality due to overstretched resources (e.g. closure of schools, reduced medical services) gave a clear signal of the gravity of issues facing Yubari, galvanising diverse interest groups to work together under the shared understanding that the current urban form was unsustainable. In other words, it may be through the built environment that the effects

of a ‘shrinking’ city on daily living are most clearly, physically and tangibly felt by people from all sectors. Planning and built environment configuration could thus provide common ground and a starting point for cross-sector discussion on (a) what the problems in a specific shrinking city are; (b) what actions need to be taken to resolve them; and (c) what a sustainable urban form ultimately *ought* to look like. In Yubari, urban planning and the configuration of the built environment have in this way acted as a focal point - if not a solution - to bring different normative positions together to work in the common direction of sustaining the future of the city as a whole and providing benefit to residents.

5. Discussion

First is the question of who benefits from managed transition planning. As per Schatz (2017) and He et al (2017), in Yubari urban reorganisation becomes a means of sustaining citizen welfare by allowing better infrastructure provision and investment in the built environment. This illustrates how land use change and reconfiguration of the built environment are important components in sustaining citizen wellbeing in a shrinking city, as they create a form and size over which functions can be delivered into the future. Yet in Yubari, prioritisation of citizen welfare over economic growth is stated *explicitly* across all sectors, and from the highest levels of municipal government. Yubari’s spatial planning strategies are supported with strong social policy. Early in 2017 the municipality announced a new fiscal rehabilitation plan, including free childcare after a family's second child and preparation of nursery facilities (Mainichi Shimbun, 2017). The YCUPM is linked to other municipal policy areas such as social welfare, and was developed with strong citizen consultation and representation (Yubari City, 2012a). Yubari therefore indicates that to sustain citizen wellbeing within managed transitions in

shrinking cities, planned land use change within the city ought to be accompanied by coherent municipal policy and decision-making processes engaging with citizen concerns.

Second is the role of individual competences in allowing Yubari to implement this ‘compact city’ planning. Yubari’s explicit acceptance of decline and moves to manage legacy infrastructure reflect principles championed in the planning literature (Pallagst et al, 2017). However, the motivation of leading figures has been vital in driving this consolidation agenda forwards as a means of responding to wider challenges brought about by the decline of the coal industry, and crucially in framing built environment reorganisation as just one part of the actions being undertaken towards restarting the city. Mayor Naomichi Suzuki acts as a 'champion' for the future sustainability of Yubari. Suzuki - born in 1983 - is active on social media (www.twitter.com/suzukinaomichi), offering a charismatic figurehead for and drawing attention to Yubari's regeneration efforts. As noted in interviews, Suzuki was also heavily personally involved in YCUPM development, attending many meetings in person. Likewise, the skills of practitioner-academics such as Tsuyoshi Setoguchi are significant in both developing the YCUPM and engaging with citizens, as is the support of municipal officials who have taken significant pay reductions and workload increases during restructuring. Competence in ‘innovation’ features regularly in other sustainability evaluation frameworks (e.g. Mieg, 2012; Wolfram, 2016). Yubari indicates that in a shrinking cities context, such ‘innovation’ may work at an individual scale in terms of ‘champions’ who can drive forward agendas and work resourcefully under constrained conditions. Competences developed and held by individuals should hence not be overlooked in understanding what makes an effective managed transition via urban planning.

Third is the somewhat unique context of Yubari. Interviewees commonly acknowledged that the severity of the financial situation in Yubari acted to galvanise different interests in the common direction of looking at the sustainability of the city, and that from this the YCUPM emerged as a viable solution. Whether one could so easily get cross-sectoral buy-in for urban consolidation in locales where the need for action has not yet become so pressing (for instance in contexts where regional and municipal governments still remain focused on growth e.g. Martinez-Fernandez and Wu 2009; Schatz, 2017) is open to question. Yubari also has specific social and geographical characteristics. The physical nature of the city, spread over a long distance due to its development along valleys, makes fragmentation and maintenance challenges more prominent and hence the value of reconfiguration more apparent. Its remoteness and relatively homogenous community also allow for collaborative governance in a way that sidesteps critical takes on 'resilient communities' seen elsewhere. Opportunities for capitalisation from private-sector involvement are limited, and citizen-led actions are explicitly targeted at improving quality of life for other, often more vulnerable, residents.

Fourth and final, Yubari's ability to become 'sustainable' by its own definition of maintaining quality of life for citizens may require further scrutiny, even under a more compact urban form. One of the municipality's main lines of exploration for a future economic base is coal bed methane (CBM), with development driven largely by the municipality itself for local use (Yubari City, 2017d). This illustrates ongoing difficulties around maintaining an economic and employment base on which the 'sustainability' of Yubari may depend. Interviewees were open and honest about the need to prioritise social wellbeing over economic factors in Yubari's planning. However, reflection on what constitutes a 'sustainable' urban economy has been seen in other shrinking cities literature (e.g. Newbury and Gibson, 2014), hence there is scope for future iterations of the YCUPM to more explicitly consider how an economic base may be

fostered to secure Yubari's ability to maintain functions into the future. Given the CO_2 emissions associated with CBM, the extent to which a managed transition away from resource dependence has been achieved could also be further assessed. This, however, is not a unique problem to Yubari and indicates challenge for shrinking cities and managed transition thinking of retaining a longer-term climate and environmental focus in areas where immediate socio-economic sustainability takes precedence.

As such, whilst the YCUPM is a strong example of the delivery of social sustainability in a shrinking city through the prioritisation of social welfare, the specificities of Yubari mean caution ought to be exercised when applying 'lessons learned' elsewhere. Methodologically, this of course reflects Yin (1984) and the limitations of the generalisability of single case studies to wider populations. However, the way in which case studies are reported and used in transdisciplinary contexts like urban research, where academics and practitioners often work in collaboration, has further implications beyond the research sphere. Peck et al (2011) caution against such 'truth spots' - locations held up as an example of international 'best practice' and used to inform planning globally, whilst losing sight of how local context made policies and practices possible in the original location. Yubari attracts increasing international attention, as evidenced by the proliferation of English-language reporting on 'compact city' planning (e.g. Hendy, 2014; Mogi and Hagiawara, 2016). This may be further intensified by both the Mayor's social media presence, and also the professionally-produced video campaign narrating the city 'restart' ten years after bankruptcy (Yubari City, 2017c). Practitioners, planners and scholars hence ought to exercise caution not to use Yubari as a 'truth spot' where lessons for planning a formerly resource-dependent city are applied uncritically elsewhere.

6. Conclusion

Yubari demonstrates that spatial planning may be a focal point through which competing social, economic and environmental pressures around transitioning a shrinking city to a sustainable form can be deliberated. Whilst Yubari's consolidation is somewhat extreme, it illustrates that coordinated changes to built environment configuration may allow social wellbeing to be sustained in the interests of the most vulnerable (in Yubari's case, the elderly) whilst reducing municipal responsibilities to maintain legacy infrastructure at a time when local government funds are likely to become stretched. Although a secondary benefit rather than a primary concern in Yubari, planning to anticipate the form of a city post-transition also opens up the opportunity to reduce exposure to environmental and climate hazards. It is important to remember, however, that Yubari's transition efforts are to an extent post-hoc in that the YCUPM was implemented post-bankruptcy. A truly 'managed' transition may require vision and foresight to initiate the planning process at a much earlier stage.

Yubari also shows that major changes to the built environment are highly emotive, especially when a 'sustainable' future necessitates reconsideration of what constitutes appropriate growth and development. Interpersonal competence in engaging residents early and taking seriously their concerns, presenting a range of possible options (including the possibility to do nothing), and working on a small-scale basis with trusted intermediaries may be necessary to get buy-in for tough or controversial decisions. Likewise, engaging civil society, industry, citizens and other municipal departments at the start of plan formation - as was done with Yubari's Masterplan Formulation Committee - can help alignment of vision and build anticipatory and strategic competence. Yet Yubari also shows this requires high-level acceptance of the need for managed decline from high-level municipal policymakers, coupled with robust systems thinking competence. Further, the involvement of private developers and citizens in delivering

cooperative urban planning is effective in Yubari for very pragmatic reasons related to the city's financial situation. In other contexts, it is vital to ensure pragmatism around enacting urban sustainability transitions does not lead to private developer dominance, and that mechanisms are put in place, drawing on normative competence, to ensure benefits continue to accrue primarily to citizens living in the consolidated urban form.

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Figures and tables

Figure 1: Location of Yubari City in Hokkaido (Adapted from map tiles by Stamen Design, under CC BY 3.0. Data by CartoDB and OpenStreetMap, under ODbL)

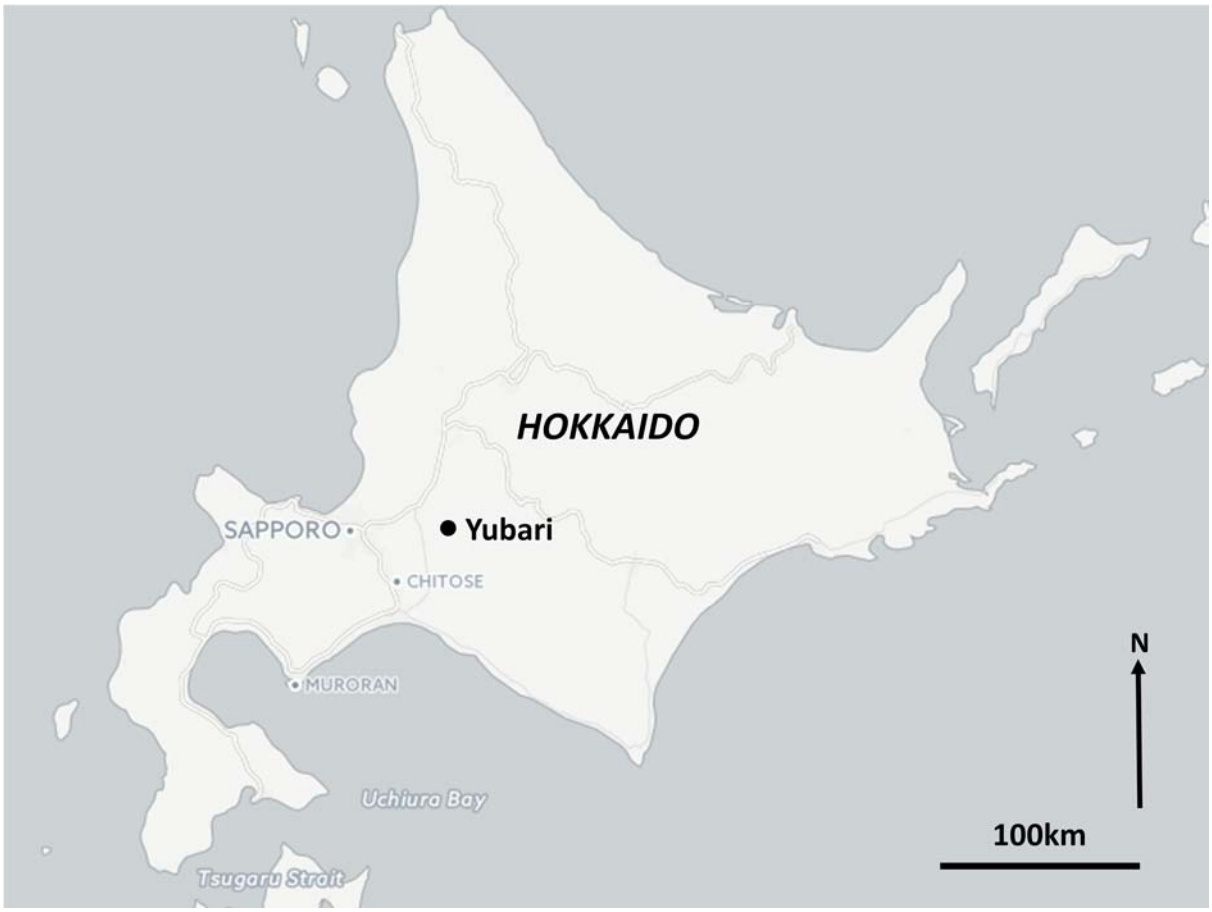

Figure 2: Main planning districts of Yubari City (Adapted from map tiles by Stamen Design, under CC BY 3.0. Data by CartoDB and OpenStreetMap, under ODbL; and from Yubari City (2012b))

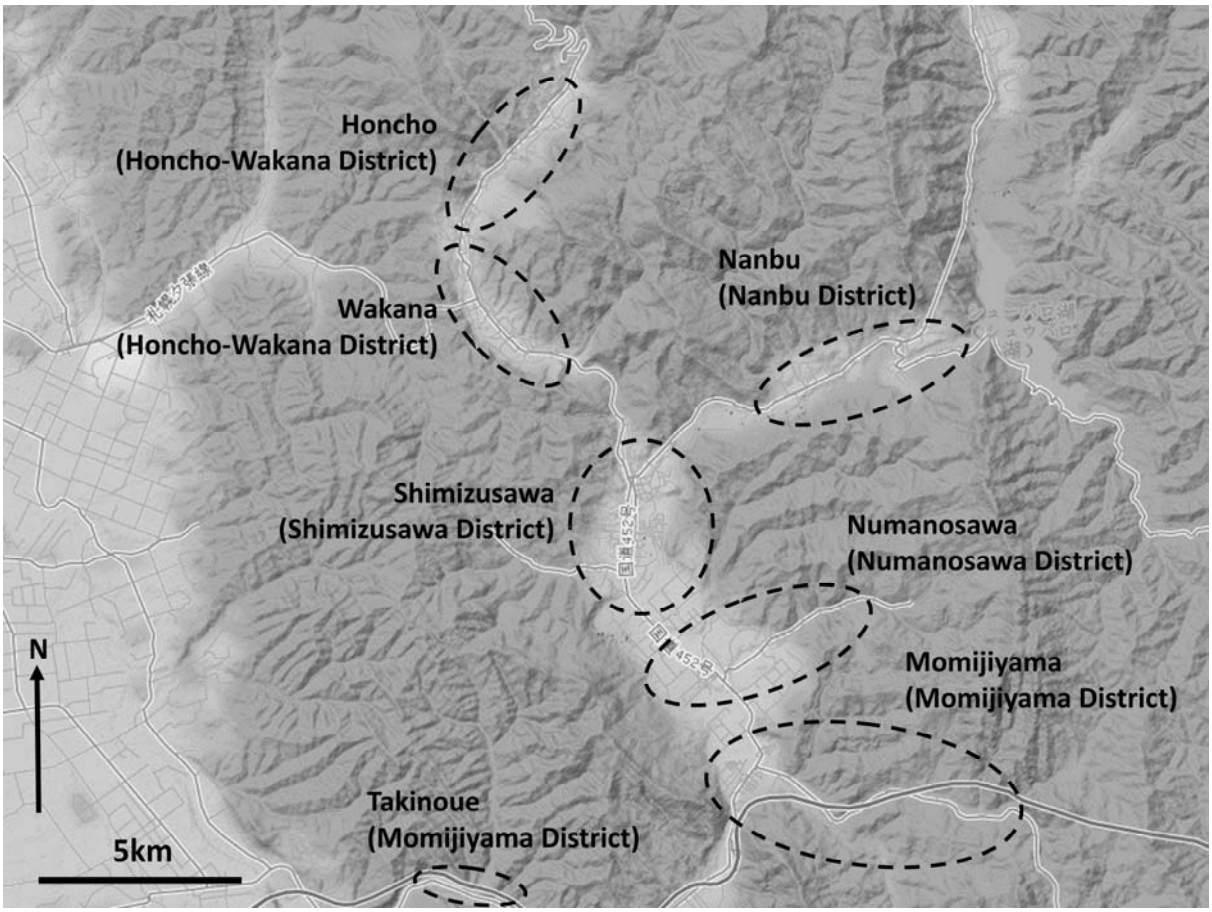

Table 1: Indicative evaluative frameworks, areas of evaluation and aims

Citation	Areas of evaluation	Aim of framework
Luederitz et al (2017)	Inputs; processes; outputs; outcomes.	Evaluative scheme for sustainability transition experiments.
McCormick et al (2013)	Governance and planning; innovation and competitiveness; lifestyle and consumption; resource management and climate mitigation and adaptation; transport and accessibility; buildings; spatial environment and public space.	Facilitating sustainable urban transformation.
Mieg (2012)	Core and growth resources, at micro-, meso- and macro-scales.	Linkage between sustainability and innovation in urban development.
Rosemborg (2015)	Driving investments; social dialogue; skills and training; social protection.	Evaluate sustainability in industrial transformations, with focus on workers.
Tyler and Moench (2012)	Agents; systems; institutions.	Enhancing resilience in the context of urban climate change.
Wiek et al (2013)	Anticipatory; strategic; systems thinking; interpersonal; normative.	Competences for sustainability.
Wolfram (2016)	Inclusive and multiform urban governance; transformative leadership; empowered and autonomous communities of practice; system(s) awareness and memory; urban sustainability foresight; diverse community-based experimentation with disruptive solutions; innovation embedding and coupling; reflexivity and social learning; working across human agency levels; working across political-administrative levels and geographical scales.	Capacity for urban sustainability transitions.

Table 2: Summary of interviews

Institution	Sector	Number of people interviewed	Why sampled
Yubari City Planning Division	Municipal government	1	Municipal government section responsible for drafting and enacting YCUPM.
Yubari citizen-led community group	NGO	3	Citizens responsible for providing municipal services post-restructuring, and also experiencing daily living in Yubari as citizens during YCUPM enactment.
Regional development association	Third sector	1	Significant knowledge of historical regional development in southern Hokkaido, and hence of socio-cultural issues around coal decline.
Regional environmental organisation	NGO	1	NGO focused on actions at citizen and household level in Hokkaido, hence insight into sustainability challenges specific to locale.
Hokkaido Government Economy Division	Regional government	2	Insight into wider regional socio-economic situation around Yubari.
Hokkaido Government Environment Division	Regional government	3	Insight into sustainability context at regional level within which Yubari situated.
Academic from institution involved in YCUPM development (via email)	Academia	1	Key figure in developing YCUPM, and in consulting face-to-face with citizens.

Table 3: Competences for data analysis

Theme	**Main issues**
Anticipatory competence	What is the future vision for Yubari? What is the role of urban planning within this? How does this relate to a managed transition and to sustainability more widely?
Strategic competence	How does the municipality plan to attain their goals? How do planners balance up the different concerns and issues at play? How are the interests of external stakeholders taken into account?
Systems thinking competence	What knowledges are drawn on in developing Yubari's urban plans? Is there capacity to understand social, economic and environmental issues?
Interpersonal competence	To what extent are publics involved in planning for Yubari's future? How do planners rationalise public involvement? How effective are these strategies in engaging vulnerable groups?
Normative competence	What is considered an appropriate future for Yubari? Are particular framings or messages used to connect with political goals? Might the political context even provide opportunities?