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Re-thinking the indices of multiple deprivation (for England):

A REVIEW AND EXPLORATION OF ALTERNATIVE/COMPLEMENTARY AREA-BASED INDICATOR SYSTEMS

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Disclaimer

The views in this report are those of the writing team. They are not necessarily shared by Power to Change staff. Any mistakes are the responsibility of the research team alone.

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Executive Summary

Power to Change was established by the Big Lottery as an organisation whose mission is to fund community businesses and through such investment make an impact on the most disadvantaged places in England. Through setting its mission to target the most disadvantaged places, the Big Lottery specified that the means of spatially targeting these areas was to be the English Index of Multiple Deprivation (IMD). The English IMD indicator has been designed to help focus government spending and is generally considered to be an example of good practice as a 'second generation' area-based indicator of multiple deprivation. However, it is not perfect and non-governmental bodies (such as Power to Change) should think carefully about how they use it.

The Bristol Centre for Economics and Finance (BCEF) of the University of the West of England (UWE) were commissioned by Power to Change to review what insights on disadvantage that the current English IMD offers us, secondly how these insights fit with the mission of Power to Change and thirdly of 'good practice' in relation to filling in the gaps between the insights of the existing IMD and the mission of Power to Change.

The English IMD needs to be thought of not as a single measure of disadvantage but as an indicator system that identifies disadvantaged places across multiple dimensions. This review suggests that the use of the top-line IMD indicator may not be appropriate for Power to Change's mission but the flexible use of the English IMD indicator system tailored to Power to Change's mission is appropriate for the organisation. Currently Power to Change appears to mainly focus on the top-line IMD indicator and thus is not using the IMD indicator system in a way that squeezes the most useful insights out of it.

We recommend:

1. *That Power to Change use the English IMD system to identify a form of multiple deprivation that best fits the hypothesis of change of the organisation from the existing components of the IMD (i.e. construct a Power to Change version of the IMD from existing components of the IMD). This flexible use of the IMD system will assist spatial targeting in the Liverpool city-region and the County of Suffolk. These are places in which Power to Change is currently working.*
2. *That Power to Change ensure that all people involved in the evaluation of community business applications to Power to Change are briefed as to the strengths and weaknesses of the top-line IMD and the rationale for the Power to Change versions of the IMD.*
3. *Further research is required on spatial targeting in relation to:*
    a. *better understanding the support context and local economic context for community businesses (at local authority area level); and,*
    b. *developing a 'community vulnerability to environmental issues' indicator to better understand the interaction of environmental disadvantage (and environmental quality) and community business impact.*

Finally, we would recommend that Power to Change thinks about building an evaluative framework for understanding the impact of community businesses that does not depend upon the IMD indicator system. Given the stated objectives of Power to Change (to support and facilitate community businesses as a sector of the economy), the strategy of collaborative enquiry with community businesses would be a fruitful way of moving forward. Working with community businesses there is a need to better understand the dynamics and impacts of the community business sectors (already one of the strategic objectives of Power to Change).

1.0: Introduction

In February 2018, the Bristol Centre for Economics and Finance (BCEF) at the University of the West of England (UWE) was asked to review the value of using the English Index of Multiple Deprivation (IMD) for the work of Power to Change. The English IMD is an indicator system that has been used by many governmental and non-governmental bodies to target 'disadvantaged areas' across England over the past 20 years. This report documents the findings from this small project.

The report is structured in the following way:

- We set out how we worked out some answers to the research brief
- We outline what the English IMD is and how it is calculated
- We review the roles that Power to Change want a multi-dimensional area-based IMD to play
- We identify some aspects of area-based disadvantage that the current English IMD does not measure well, as well as outlining the possibilities for including the 'missing' elements
- We make recommendations for strengthening the process of area targeting for Power to Change

2.0: Method underpinning this report

The BCEF research team were asked to consider the following research questions:

- How does the current synthetic IMD compare to 'good practice' elsewhere across Europe (both in relation to the substantive content but also in relation to how it is derived) for measuring social disadvantage (and changes in social disadvantage)?
- How useful is the English IMD for Power to Change in relation to the core business/activities of Power to Change (for which the IMD is deployed)?
- What new, additional or amended indicators might be developed to meet those needs, and how feasible is it to build alternative synthetic indicators?

The BCEF research team sought answers to these questions in the following ways:

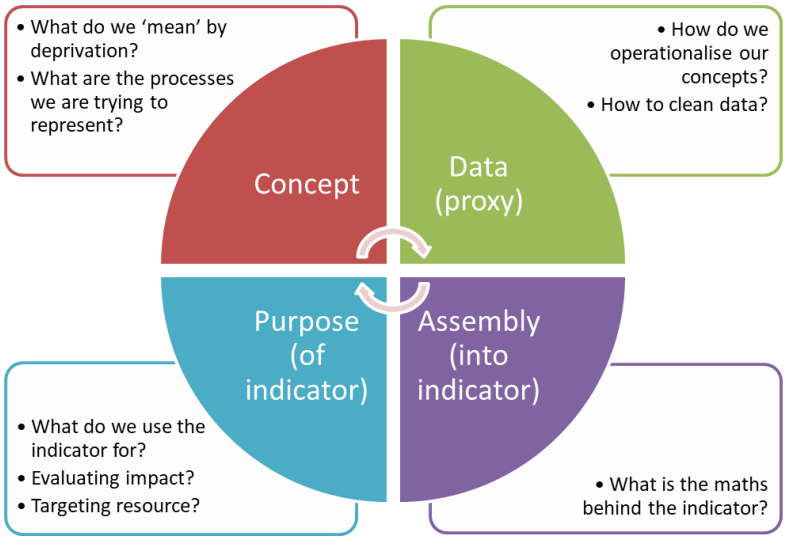
- We reviewed consultation documents and reviews related specifically to the English IMD.
- We did a desk-based review of both the academic literature and 'reviews' of indicator use related to measuring area-based disadvantage to identify examples of 'good practice'.
- We ran two workshops with key participants from Power to Change (in April and May 2018) to explore firstly expectations and disappointments with using area-based indicators of disadvantage (in current Power to Change work) and secondly how the English IMD currently matches those expectations.
- Where feasible we constructed some alternative scenarios for using existing area-related data-sets/components of the English IMD to identify disadvantaged areas for the work of Power to Change.

3.0: What is the English IMD indicator system?

There is no single way of measuring something as complicated as disadvantage. Some measures of disadvantage are more appropriate/useful for any given context than others – but none are perfect. It is also worth remembering that indicators are not designed to be perfect indicators of the concept they are designed to represent as but as 'good enough' tools to help do a (specific) job (see also Land (2001) on understanding social indicators as a 'model' of reality).

Figure 1 attempts to outline how we might understand not only the headline issue (in this case multi-dimensional area-based disadvantage) but also understanding the organisational/policy context in which that indicator is used. Figure 1 thus emphasises the data that are used to calculate an indicator (the proxy-variables) and the means of combining the variables together to come to a headline figure (the assembly process) but it also requires us to think about the specific job to which an indicator is applied (the purpose) and the concept being modelled. Thus Figure 1 outlines the kind of questions to be asked when considering each of the four stages.

Figure 1: understanding the making of an indicator



Thus, to review what the current English IMD does (and how fit for purpose it is) we need to consider:

- What was it built for (what is the purpose)?
- What is the underlying concept it was built to measure?
- What is it calculated from (and how it is calculated – proxies and mathematical assembly)?

3.1: What does the English IMD measure?

The current English IMD system is the fifth iteration of the index and was released in 2015. The first version emerged from a need to spatially target government spending at 'neighbourhood-like' sized areas through the Neighbourhood Renewal Strategy and all its attendant 'joining-up', 'bending mainstream spending' and desired distributional concerns (no one should be disadvantaged by where they live). The broad design in terms of what themes are included and how the indicators are calculated have remained similar over its five iterations but the indicator set is not strictly

comparable from one set to another because the detailed list of variables used to construct it have changed over each iteration. So, it is a set of indicators that were calculated to enable central government to target specific funding programmes to the most disadvantaged areas in response to a particular idea of area-based disadvantage. It is not a set of indicators that were designed to evaluate the impact of those policies and programmes.

Table 1 indicates the structure of the indicator system. Starting from variables, there are 37 variables that have been selected because they are both available and can be constructed for the whole of England at the spatial scale of the lower tier super output area (LSOA; average population of 1,500 residents). These variables are then combined to create domain and sub-domain scores that are ranked. The ranking on each sub-domain is adjusted mathematically (using a probability curve) to emphasise disadvantaged scores. To create the overall indicator score (the IMD) the dimensional scores are combined using the weighting. Where there are sub-domains the sub-domain scores are generated first before creating a domain score from the sub-domain scores. Weighting varies the importance placed on the different dimensions, so that in this case income deprivation is judged to be 2.5 times more important than the barriers to housing and services in the overall assessment of area-based disadvantage.

Table 1: The English IMD 2015 – a system of indicators

Main domain	Weight	Description of domain/sub-domain	No of variables
Income deprivation	22.5%	Welfare administration data	6
Employment deprivation	22.5%	Claimant data on unemployment and worklessness	5
Health deprivation and disability	13.5%	Mortality, morbidity, mental health and incidence of 'disability'	4
Human capital deprivation	13.5%	School-related attainment by children and young people	5
		Working age qualifications	2
Crime	9.3%	Recorded crimes relating to violence/property theft	4
Barriers to housing and services	9.3%	Geographical barriers – distances to services	4
		Wider barriers – housing affordability	3
Living Environment	9.3%	Indoors living environment – housing quality	2
		Outdoors living environment – traffic-related	2
7 domains		10 sub-domains	37

So, the IMD is generated from a system of indicators but the overall score is dependent on the weightings that are used. There is no scientific and absolute method of determining what the weighting scores should be. They have been subject to scrutiny. Dibben et al. (2007) carried out sensitivity analysis on the weightings and found that although swapping the weight on the employment and health domain might be justified, it made little difference to the overall ranking of areas. Smith et al. (2015, p24) claim that 89% of IMD users are broadly satisfied with the ranking system and the associated weights. However, this is not to say that the IMD overall indicator is the most appropriate one to use in all contexts.

The underlying assumption of an area-based indicator is that if a particular phenomenon (for example worklessness) is measured in an area at the same time as a second phenomenon (for

example high levels of reported crime), then the phenomena are in some way related – this is an ecological association. This is not a direct measure of whether workless households also experience high levels of crime as you might get from a household survey which asks householders both about their employment status and their experience of crime. The assumption of things that happen in the same place relate to each other is sometimes described as an 'ecological fallacy'.

As outlined by Fairburn et al. (2016, p758), the advantages of area-based indicators of disadvantage include:

- They are useful in communicating issues of area-based disadvantage to a wider public;
- They are useful for spatial targeting of resources.

The downside to area-based indicators is:

- They rely on the assumption that all the area-based measures (across the different dimensions) are experienced by the same people (who live in the area) just because they 'happen' in the same place (the ecological fallacy); for example, an area could have 50% low income and 50% significant health problems but there is no way of telling if 50% have low income and health problems, or whether the two groups are completely separate;
- The weighting of the components is difficult (i.e. how you combine the different elements) and subject to judgement;
- Indices that combine many different variables (37 in the case of the English IMD system) may sometimes hide specific phenomenon of disadvantage (that might only be evidenced in a single component variable). So, it can be sometimes difficult to identify the specific underlying cause of the disadvantage.

3.2: IMD systems from other places

Noble et al. (2006) outline the basic principles behind the English IMD indicator system. Within the United Kingdom, all the constituent nations have their own version of IMD (as well as countries such as Denmark, New Zealand and Canada – see Meijer et al. 2013, Exeter et al. 2017 or Schuurman et al. 2007 respectively). All are area-based indicator systems offering insight on multiple dimensions with the idea of identifying disadvantaged places (or areas). These second-generation indicator sets mainly build on the work that went into the construction of the first version of the English IMD (see Pasetto et al. 2010 for review of first-generation disadvantage indicators across Europe). There are variations in the specific variables (the proxy variables) that are used to construct the different national indices that are determined by data availability and reliability in each national context. Equally these other experiences also use slightly different methods of weighting and combining their dimensions (differences in 'assembly' stage) so that these sets of indicators are not directly comparable beyond their national contexts and over time.

Focussing on the indicator systems that have emerged within the nations of the United Kingdom, Table 2 outlines the dimensions included within the national indicator systems and the weightings selected within the indicator systems for England, Scotland and Wales. The principal differences are in the weightings given to 'access to service's as a form of disadvantage. Scotland and Wales, both nations with a higher proportion of rural areas, place a greater weight on accessibility to services (around twice the weight) than is applied in England. In the UK nations, the proxy data used within the dimensions also varies (we will discuss this in Section 5). Thus, the development of these indicators systems implies the application of similar processes of data assembly and of similar forms

of defining a concept of area-based disadvantage but they have not used the same proxy data. Many of the policy areas implicated by the indicators are devolved responsibilities (e.g. education, health and regeneration) and so following the logic of 'purpose' from Figure 1, there is no reason why they need to be the same across the four nations. The indicator sets are not directly comparable across the four nations because of the policy contexts in which they operate (see Payne and Abel 2012 for suggestions on how to combine them to understand disadvantage across the UK as a whole).

Table 2: Comparison of weightings across IMD systems in Great Britain.

English IMD 2015			Welsh IMD 2014		Scottish IMD 2016	
Main domain	Weight	Sub-domain	Domain	Weight	Domain	Weight
Income deprivation	22.5%	Income	Income	23.5%	Income	28%
Employment deprivation	22.5%	Employment	Employment	23.5%	Employment	28%
Health deprivation and disability	13.5%	Health	Health	14%	Health	14%
Human capital deprivation	13.5%	Children and young people	Education	14%	Education	14%
		Working age qualifications				
Crime	9.3%	Recorded crimes	Crime	5%	Crime	9%
Barriers to housing and services	9.3%	Access to services	Access to services	10%	Access to services	9%
		Housing affordability	Housing	5%	Housing	2%
Living Environment	9.3%	Housing quality				
		Outdoors living environment – traffic-related	Physical environment	5%	Not included	0%
7 domains		10 sub-domains	8 domains		7 domains	

3.3: Measuring the IMD at a higher-level geography

The English IMD is constructed at the level of the lower level super output area (LSOA). LSOAs on average have a population of about 1,500 residents which is larger than the average rural parish. The scores can be calculated at areas that are made up from LSOAs (e.g. local authority areas or labour market areas). This is done in a number of ways:

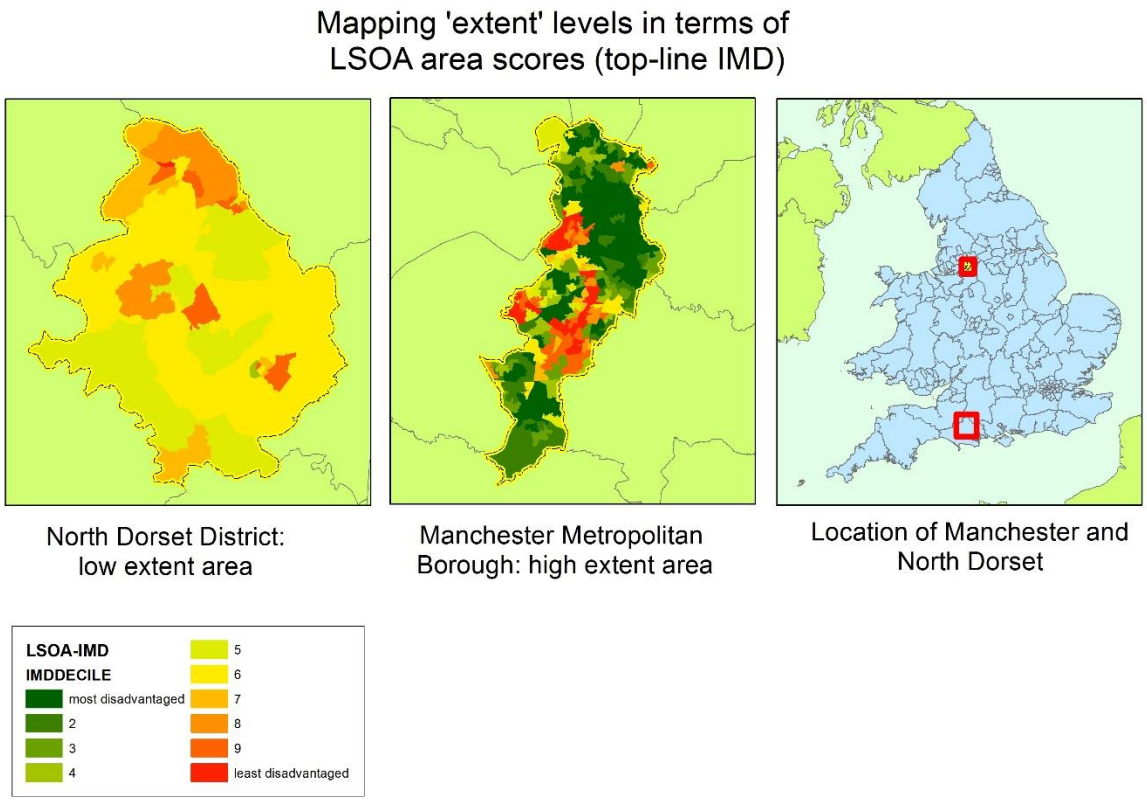
- the average (mean) rank of indicator score for all LSOAs in the higher-level area;
- the average (mean) score of indicator score for all LSOAs in higher-level area;
- the proportion of LSOAs in the higher-level area that are in the most 10% disadvantaged (of all LSOAs in England).

In addition to these three obvious methods of recording an average level of disadvantage within the higher-level geography, there are two additional methods of ranking higher-level areas in terms of their disadvantage. These additional measures are defined as:

- the extent of disadvantage in a higher-level area is the proportion of the area population that lives in the 30% most disadvantaged LSOAs in England (using a weighting on the level of disadvantage); and,
- the local concentration of disadvantage in a higher-level area is the population weighted average rank of the areas incorporating the 10% most disadvantaged LSOA-based population in the higher-level area (ranking within the higher-level area only).

To give a better idea of what 'extent' of disadvantage look like, Figure 2 maps both extent of disadvantage for a local authority area with a low measure of extent in relation to the general headline IMD indicator (North Dorset) and the local authority of Manchester that records a high level of 'extent of disadvantage'. Figure 2 demonstrates that 'high extent' is also associated with high levels of disadvantage (on average). In general, there is a high level of correlation between rankings on the five different ranking systems as illustrated in Table 3 where the correlation indices for all the five measures of higher-level disadvantage area compared. Correlation is measured as a score of 0 (no correlation) to +/-1 (perfect positive or negative correlation) so it can be seen from Table 3 that these five wider-area measures of disadvantage are each telling a very similar story.

Figure 2: Geographies of disadvantage and advantage – extent of disadvantage[1]



[1] Contains public sector information licensed under the Open Government Licence v3.0.

Table 3: Indices of Correlation between the five measures of 'higher-level geography' disadvantage

	IMD - Rank of average rank	*IMD - Rank of average score*	*IMD - Rank of national concentration*	*IMD - Rank of extent*	*IMD - Rank of local concentration*
IMD - Rank of average rank	1.000				
IMD - Rank of average score	0.990	1.000			
IMD - Rank of national concentration	0.814	0.871	1.000		
IMD - Rank of extent	0.924	0.959	0.910	1.000	
IMD - Rank of local concentration	0.879	0.930	0.925	0.966	1.000

3.4: Key ideas that underpin the English IMD as a measure of area-based disadvantage

In relation to the English IMD indicator system:

- The English IMD measures the level to which an area is disadvantaged. It attempts to identify areas where the combined conditions in relation to household income, labour market conditions, educational attainment, health of the population, levels of crime, accessibility and housing stock conditions are so bad that they are likely to disadvantage individual households or people. It is not a measure of how disadvantaged individuals/individual households are.
- Whereas the basic geographic unit of measurement? in the English IMD is the LSOA (average population 1,500 residents), you can combine these to measure disadvantage in larger areas (such as local authority areas or travel to work areas). At these 'higher' levels there a number of ways of measuring 'disadvantage' that not only take into consideration an 'average' of disadvantage score but also the 'concentration' or 'extent' of disadvantage across the wider area.
- The 'overall IMD' number/ranking involves combining data across the seven dimensions into a single headline figure. It is not always obvious for example how you add an unemployment rate (for an area) to a number that measures life expectancy. This is achieved by using 'weightings' and creating ranking systems (for each variable). On the whole, the way in which the English IMD does this makes sense (see Dibben et al. 2007) and in a way that others have copied (see Fairburn et al. 2016). Remember it might be more useful to look at the individual dimensions and not the overall headline figure (it is an indicator system and not a single measure) depending on what you are interested in (we return to this in Section 6 below).
- To construct an IMD that covers the whole of England down to areas containing 1500 residents (a lower super output area or LSOA) some practical decisions needed to be made about the data that was used. These choices inevitably restrict what the IMD actually measures but should not totally devalue the indicator – it is a useful number, but it is only offering partial insight into places. The English IMD will not measure everything you might think as being 'important' – it is a good measure of area-based disadvantage in England, but it is not designed as an indicator for community business environment (for example).

4.0: How does Power to Change currently use the IMD indicator system?

In setting up Power to Change as an organisation to fund community businesses, the Big Lottery Fund defined the mission of Power to Change in terms of the English IMD. The key performance indicators of Power to Change include "[investing] 58% funds (£ value) [..] in the 30% most deprived communities" where the 30% of the most deprived communities are defined in terms of the IMD. The performance indicator does not define what constitutes a "community" (neighbourhood or local authority area). A second performance indicator directs Power to Change to invest in "priority areas" but does not define how those "priority areas" are to be selected. The need to target specific disadvantaged areas is embedded in the work of Power to Change and 'good practice' in the English public sector would be to use the IMD indicator system as a means of achieving that.

The aim of this Section is to explore how closely the concept of disadvantage embedded in the IMD aligns itself to the stated aims and objectives of Power to Change. This Section is informed by the two workshops the research team ran with Power to Change in May and June 2018 but also through a reading of key Power to Change documents (such as the Power to Change Strategic Plan – see Power to Change 2015).

4.1: Investing in community businesses to make places better

Following the idea embedded in Figure 1 that an indicator is a statistical instrument that is designed for a specific purpose, in order to understand how fit for purpose the IMD indicator system is for Power to Change's work, we need to understand how Power to Change see the relationship between community businesses and area-based disadvantage. Power to Change has a series of working hypotheses at business-level and at the level of place (Power to Change undated) as to the likely impact of community businesses on places as well as a 'theory of change' (Power to Change 2015) that sets out what is meant by the longer terms outcomes of investing in community businesses. The general logic here is to identify what constitutes a 'better place' assuming that places without the characteristics of 'better places' are disadvantaged. We can then review whether these characteristics of a 'better place' are currently included within the English IMD indicator system.

The research team has engaged in a process of re-interpreting Power to Change's working hypotheses and initial theory of change (from the Strategic Plan 2016-18). Figure 3 is the outcome of that re-interpretation. We have tried to simplify a theory of change in so far as it touches on the direct investment in community businesses (rather than the objectives focussing on better understanding how community businesses work). Power to Change aims to invest in community businesses (in sectors such as [social] housing, [local] energy, social care, community pubs and community post offices). These businesses are likely to generate jobs and income in the local economy. Some of the businesses will provide services (of general economic interest) for the local economy (part of the residential economy) and they may generate a wider sense of community well-being as well as training local people in articulating their democratic voice in their locality. This series of boxes might be thought of as plausible outcomes flowing from investing in community businesses.

In Figure 3 the 'area-based' longer term outcomes are set out in the yellow boxes. These boxes emerge for the most part from the Power to Change theory of change published in 2015. Thus, better places are ones with better employment opportunities for residents who enjoy better health and better personal well-being. They are places with the local services that are accessible and that

are of a quality that residents want. By inference places that do not enjoy these characteristics are 'disadvantaged'. It is logical then to expect any indicator used to target resources for Power to Change to be able to identify places on the basis of these characteristics.

Figure 3: Re-interpretation of Power to Change's theory of change, in relation to investing in community businesses by the research team

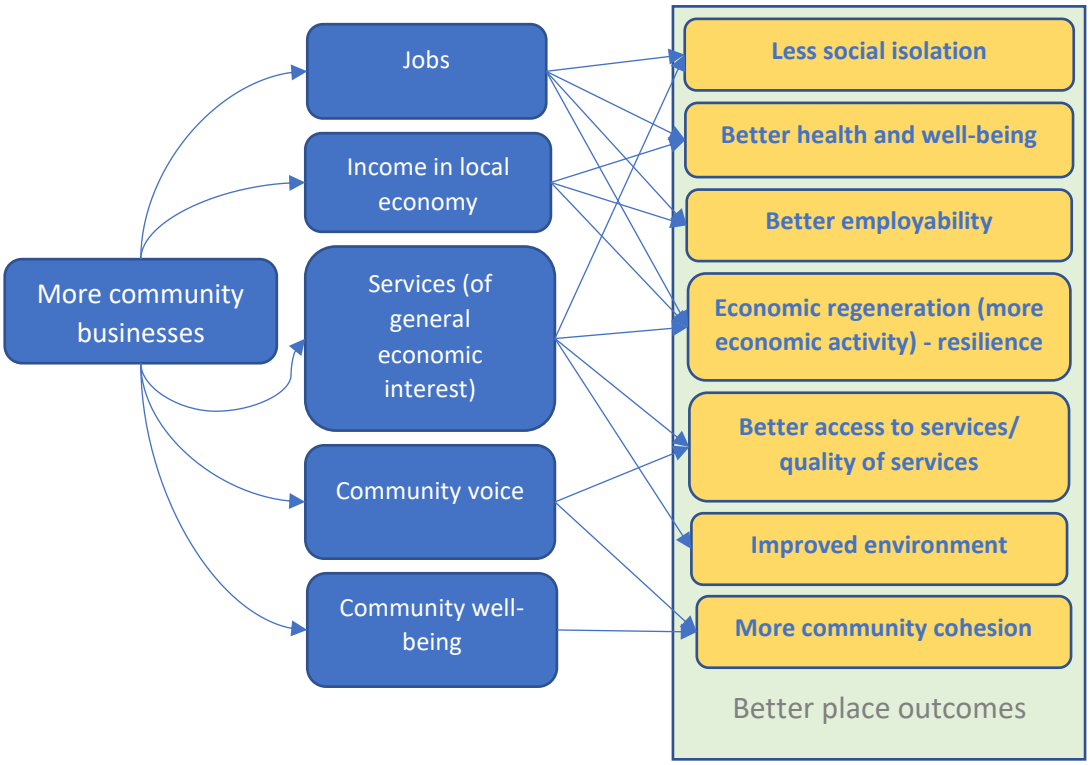


Table 4 tries to link the desired outcomes of community business investment (as re-interpreted in Figure 3) to the dimensions contained within the English IMD indicator system. Of the seven 'better place' outcomes targeted by Power to Change in Figure 3, only three are captured by dimensions within the overall IMD indicator: health, employability (if we interpret 'employability' as measured by qualifications and language proficiency) and access to services. Two of Power to Change's intended outcomes (social isolation and community cohesion) are not captured at all in the current IMD. Improved environmental quality is partially captured (as measuring air quality) and it is difficult to interpret the desire for economic regeneration in terms of how the IMD is currently set up.

Table 4: Fit between Power to Change outcome measures (as interpreted by research team) and the English IMD

Outcome measure (targeted by Power to Change) – see Figure 3			Indicative concept(s) to measure	Incorporate in English IMD
1	Personal and social well-being	Less social isolation	E.g. number of single person households, loneliness	Not included as a variable, not included as a domain
2		Better health and wellbeing	As a general measure of physical and mental health	Included as a domain (health and disability)
3		More community cohesion	Trust and belonging, social capital, social well-being	Not included
4	Economic conditions (in general and residential economy)	Better employability	Measured as a quality of labour supply – quality of qualifications/human capital	Included as a domain (education, skills and training) – measures % adults with no qualifications and proficiency in English language
5		Economic regeneration	Measured as a measure of economic conditions – labour market supply, productivity, start up	Labour market conditions included in terms of unemployment. Other aspects not included
6		Better access to services	General access to post office, primary school, food shop, GP surgery	Included as a sub-domain
7	Improved environmental quality		Might include amount of green space, might include measure of environmental justice	Only air quality measured

4.2: Identifying gaps in the IMD

Within the workshop sessions we posed the question firstly of how Power to Change staff used the IMD and secondly whether their use of the IMD matched their real-world experiences of area-based disadvantage.

Overall there is a clear belief that the IMD indicators need to be used albeit this is combined with a sense that the indicator does not quite 'fit' what Power to Change are trying to do:

> *"Power to Change had a specific KPI to target at least 60% of our funding into 30% most deprived areas – we use IMD as [a] measure [of disadvantage] but it doesn't fit our purposes"*

Table 5 summarises the discussions within the workshop dividing the issues up into the four dimensions of indicator construction (also see Figure 1): purpose of indicator, concept represented by the indicator, proxy variables used to calculate indicator, and the method by which the proxy variables are combined into the indicator.

Table 5: Relating Power to Change practice with the strengths and weaknesses of the IMD indicator system

Indicator issue categories	Issues raised in Power to Change workshops	Comments on the fit between current IMD data and the requirements of Power to Change
Desired purpose	Spatial Targeting of resources	Area-based IMD is useful (see Section 3) for identifying (structurally) disadvantaged areas
	Application to specific 'thematic' interests such as housing, access to services, community energy	The IMD is a measure of generalised disadvantage – the headline figure is not designed to capture specific forms of disadvantage (such as fuel poverty)
	Evaluating impact of funding	Area-based IMD is not designed for evaluating impact of investment (over timescales needed)
Concept in practice	Multi-dimensional view of disadvantage needed	IMD does cover many dimensions that are important to Power to Change – but they might not relate clearly enough with Power to Change priorities (see Figure 4)
	Access to services in rural areas is an important feature of Power to Change's work	Rural disadvantage is represented through access to services (see Section 5)
Variables that flow from concept	It is the absence of coverage relating to social well-being, personal well-being and conditions for community businesses to flourish that is problematic with existing IMD	Areas such as access to services and environmental quality are included but might not be the specific aspects that are important to Power to Change
Assembly	Need to target bespoke geographies (relating to specific businesses) and flexibility	It is possible to represent IMD data at different scales/for bespoke areas

As with any instrument, it is important that the instrument (in this case the IMD indicator system) is used for purposes that are plausibly related to its construction. We would argue that the issues arising from Table 5 centre on three categories of use: instances where the full value of the IMD are not being recognised; instances where the IMD is being used inappropriately; and instances where the IMD does not cover the things that are important to Power to Change. Thus, some of the issues raised by Power to Change staff (for example using the IMD as an indicator to evaluate impact) are problematic because this is a use for which the IMD was not intended. Equally it is clear that the full functionality of the IMD indicator system is not being used to maximise the benefits of using a data-set that is constructed for general use. Extending this further, the objectives of Power to Change either go beyond the issues that the IMD currently measures (personal and social well-being) or go beyond the ways in which an existing dimension is currently measured as a proxy variable (access to services or measuring environmental quality) in the IMD indicator system.

Based on the workshop discussions, we identified two themes for further development through this project:

- Firstly, it is important to better understand how the English IMD can be used rigorously but creatively; and
- Secondly, it is also clear that the English IMD does not cover all the themes that Power to Change consider important to their work of facilitating community businesses and to the issues on which Power to Change expect their grantee community businesses to impact. In particular the missing dimensions relate to: forms of disadvantage that flow from local economic development conditions, forms of disadvantage that flow from access to services, forms of disadvantage that result from social connectedness or community well-being within places (for example feelings of being isolated/lonely).

We will explore these issues further through Section 5 (filling in the missing dimensions) and Section 6 (using the full power of the IMD indicator system).

5.0: Measuring the missing dimensions

Section 4 establishes that there are aspects of disadvantage of interest to Power to Change that are either not included at all such as social well-being or that are only partially covered (access to services). Power to Change not only wants to think about generalised forms of multi-dimensional disadvantage but it also wants to focus on thematic work relating to housing, access to services, community energy or delivering social care. This Section will explore the degree to which the gaps in the current IMD indicator system can be filled with reference to: rural disadvantage; disadvantage related to personal and social well-being, measuring local economic conditions; measuring access to services; and measuring environmental quality.

Under each of these headings we need to consider:

- How might the (missing) issue be measured/conceptualised?
- What are examples of 'good practice' in including these missing dimensions?
- What is the availability of potential proxy measures?

5.1: Measuring deprivation in rural areas

> *"[One] challenge [for Power to Change is] to identify/articulate rural specific disadvantage" Workshop 1*

In the workshop sessions it was clear that participants had a strong interest in 'rural' forms of disadvantage – this interest has been further cemented by the selection of the rural County of Suffolk as one of the key locality foci for Power to Change. It has certainly been a long-standing critique of area-based indicators that they poorly represent rural deprivation (see Martin et al. 2000 reviewing first generation indicator systems). However, this is not always the case. Bertin et al. (2014) compared the merits of four different area-based indicator measures (mainly related to health outcomes and the determinant of health outcomes) that were applied to urban and rural areas of Brittany (in France). They suggest that health-outcome indicators were variable in their ability to pick out pockets of rural as well as urban deprivation.

Fecht et al. (2017) compared the performance of a first generation (census-based) indicator (Carstairs indicator) and the English IMD to identify disadvantaged areas by separating rural and urban areas and re-standardising indicators across both urban and rural areas separately. They found re-standardising across rural areas alone was better able to identify the heterogeneity of disadvantage in rural areas. Thus, it is possible to use the same data proxies (for urban and rural areas) but to vary the method of assembly to stress urban or rural spatial uneven-ness in disadvantage outcomes.

The principal critique of Martin et al. (2000) towards first generation indicators for rural disadvantage stressed the absence of any measurement of spatial distribution in the census-based indicators they tested. The English IMD system included a dimension measuring access to services that was intended to capture a particular rural experience of disadvantage -as a dimension it has been included since 2000. We return to the issue of measuring accessibility to services in Section 5.4.

Some authors argue rural local economies work differently from urban ones. For example, Monks et al. (2000) argue that rural labour markets are characterised by hidden underemployment whereby workers are forced to take up less skilled employment and for shorter hours than they might prefer

due to the lack of choice in rural areas. The specific issue of capturing hidden employment was reviewed back in 2015. At that time, it was concluded that "despite wide ranging data exploration, it has not been possible to identify any suitable data sources" (CLG 2014). So, although hidden employment may be a specific feature of rural disadvantage, there is no means of consistently measuring it at a neighbourhood level across England as a whole.

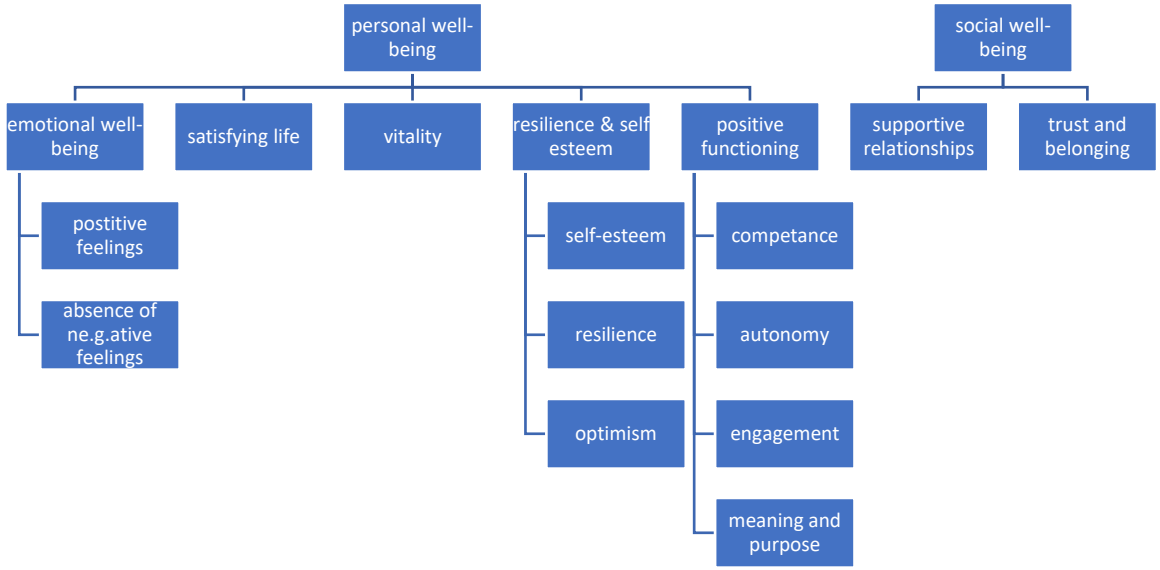
The English IMD does include a measure of access to services that might be considered to be valuable 'good practice' in capturing rural disadvantage although we shall return to the problem of measuring access to services below. On the issue of how important access to services is within the bundle of dimensions is a more problematic issue that we return to in Section 6. Whereas rural issues of hidden employment are not systematically included due to the absence of robust data.

5.2: Incorporating measures of well-being

> *"[The existing IMD] doesn't include some [measure] of community /support available from community members" Workshop 1*

It is clear from the Power to Change list of intended outcomes (as a result of investing in community businesses) that a set of issues that might be described as 'well-being outcomes' are important to the organisation. The New Economics Foundation sets out a framework for understanding the notion of 'well-being' in Figure 4.

Figure 4: A framework for defining personal and social well-being



Source: Michaelson et al. 2012

As can be seen, well-being under this framework is divided into 'personal' and 'social' well-being whereby personal well-being relates to individual level emotional and psychological attitudes and conditions whilst social well-being relates to the ways in which individuals are connected to their wider social networks. Comparing the headings in Figure 3 with Figure 4 (intended outcomes of Power to Change's work), there is clearly overlap in relation to social isolation (either as personal or

social well-being), community cohesion (as social well-being) and improved mental health outcomes (as personal well-being). Table 4 shows these concepts as absent from the existing English IMD indicator system.

The problems of measuring the concepts in Figure 4 are long-standing (see Knox 1978). Within the UK, the practice for measuring social well-being has focused on survey-based methods whereby data about the same respondents can be linked across the different contexts. This is a different approach to the construction of an area-based indicator such as the English IMD where relationships between dimensions are based on group means. Bodies such as the Social Life Institute have taken survey-based data on social surveys; as there are insufficiently large sample sizes to simply look at survey results area by area, they have generated survey-based data for small areas using statistical models (see Bacon and Woodcraft 2016). The Social Life Institute describes this data as 'predictive' but the key idea is that it is not based on empirical measurement in all small areas but based on generalising from a series of survey data-sets. For example, Social Life creates an indicator for 171,000 output areas based on two surveys of which one had a sample of 35,000 households whilst a second variable at output area level is generated from a survey of 5,000 respondents. These statistical methods involve a degree of informed speculation and at very small scales are likely to be associated with large margins of error.

In addition to the statistical technique of modelling survey data onto areas, where the survey sample size is big enough, estimates of well-being can also be directly estimated. For example, the Office for National Statistics (ONS) has inserted four questions relating to personal well-being in the Annual Population Survey. These questions relate to life satisfaction, feeling worthwhile, happiness and anxiety. Based on 85,000 responses the ONS produce (upper tier) local authority area estimates based on actual responses; but even at this sample size, estimates at local authority level are only reliable at unitary and upper tier (county-level) local authority level. Although this dataset is clearly problematic for targeting at specific communities in specific neighbourhood-sized localities, it does give some indication of generalised personal well-being at the level of local authority areas.

So, there are data sources to estimate personal and social well-being at sub-national levels but these are not always robust and reliable at the level of the LSOA (neighbourhood size). In the absence of these direct measures of social and personal well-being the temptation is often to adopt a proxy measure – however indirect proxy measures are not always valid. For example, one might assume that one could measure social isolation in relation to the number of single-person households. In a study of social isolation amongst older people Cornwell and Waite (2009) explored a variety of proxy measures for social isolation including household structure through survey research. They found that living in a single person household was not a reliable proxy for measuring social isolation since social isolation relates to the social networks of people rather than the type of household they live in. Thus, in assessing the notion of social well-being it is important not to use reductive or simplistic proxy measures (re-iterating the points made by Knox 1978, 40 years ago).

5.3: Capturing local economic conditions

> *"IMD[-related indicators] measure deprivation but they don't measure the assets and opportunities in an area" Workshop 1*

The aim of Power to Change is to impact on the local economy of the localities in which they invest in community businesses. Using indicators to identify either areas of opportunity for community business or areas in which the supporting framework for community businesses is absent is a very different indicator purpose than identifying areas where multi-dimensional disadvantage exists for residents in terms of indicator purpose. There is a problematic tension here between identifying the best opportunities for community businesses to flourish as opposed to identifying disadvantaged areas for which (it is hoped) community businesses may have the greatest (social) impact. Given the initial design for the English IMD, it is not surprising that the IMD indicator system is better positioned to identify areas of greatest existing social need but is poorly designed to identify community business opportunity/constraint.

In terms of its theory of change (re-interpreted in Figure 3) Power to Change is not explicit as to the local economic impacts it is aiming to facilitate. On one hand there is a clear desire to improve access to a range of services in places and this will be considered under access to services in Section 5.4 (and has also been discussed under 'rural deprivation' in Section 5.1). There is a clear understanding that better quality services in places may have additional benefits such as improved health and well-being and improved labour market opportunities (in the range of jobs available and in training opportunities).

The workshop discussion on identifying this as an area-based issue touched on many aspects of local economic development and the relationship between community businesses and the local economy. The Power to Change concept for a better place is based on there being 'economic regeneration' but there is little notion of what that might mean. There was a clear notion of community businesses changing economic flows in localities as envisaged by the 'leaky bucket' metaphor of local economic development (see Ward and Lewis 2002) whereby community businesses might retain a greater level of spending within a locality rather than this income 'leaking' out to other places. The issue then becomes one of identifying places that are either better or worse at retaining money within the immediate local economy. This also opens up questions as to what the most appropriate spatial scale to think about economic leakiness is – it is not clear that neighbourhood is the most appropriate level to think about this. It might be argued that neighbourhood is not the most appropriate geography because businesses (even community ones) might be dependent on labour, assets and markets that extend far beyond the neighbourhood.

In the English IMD system 'supply side' labour market conditions are captured in terms of the skills and qualifications of the working age population, and in terms of the educational attainment of local children. It is less clear how the 'demand side' conditions (or the conditions that facilitate/constrain the emergence of community businesses) are captured.

Wong (1996 cited in Wong 2002) carried out a comprehensive review of US, British and other European literature in the mid-1990s to establish 11 dimensions of local economic development pertinent to local authority areas in England. These 11 dimensions are set out and defined in Table 6. Table 6 also considers whether any aspect of the LED dimension is already covered within the English IMD indicator system.

Table 6: Local Economic Development (LED) factor after Wong (2002)

LED factor	Definition of LED factor (after Wong 2002, p1836)	Variables used	Covered by English IMD system
Locational factors	Relates to attributes external to an area – it relates to accessibility to wider markets and production factors	Access by air/road to key locations	No
Physical factors	Availability of sites and premises	Availability of premises	No
Infrastructural factors	Relating to accessibility to transport and communication networks	Car-related commuting measures	No
Human resources	Labour market (supply side) conditions	Unemployment and qualifications	Yes, under Education and Employment
Capital and finance	Access to capital for investment	Access to venture capitalists	No
Knowledge and technology	The presence of 'frontier' or 'high-tech'/innovative sectors	Location quotients of high tech industry and universities	No
Industrial structure	The mix of industrial sectors present – mix of export and residential economy	Concentration of business service sector businesses	No
Quality of life	Desirability of the place to live – amenity value	House price, council tax rate, educational attainment	Some aspects covered under environmental quality
Business culture	Levels of entrepreneurship, start-up and survival rates of businesses, capacity of existing businesses to innovate	Start up and death rate of businesses	No
Community identity and image	Community cohesion	Balance of in and out commuting flows	No – considered under 'social well-being'
Institutional capacity	The coherence of local policy frameworks and the networks that elaborate policies	No proxy measure identified	No

It is perhaps not surprising that very little of this set of indicators is captured within the English IMD since the IMD was designed to capture the spatially uneven outcomes of economic development and was not designed to capture whether areas had the appropriate conditions for local businesses to flourish. If Power to Change wanted to capture an indicator set that focussed on local economic conditions (over and above the presence of local community services), it would imply the need to commission a project to work on this since local economic conditions are neither captured by the existing IMD indicator system nor is there an existing alternative set of indicators capturing Wong's 11 dimensions for local economic development. These indicators would either need to be developed at local authority level in order to 'fit' with the policy environment (of business support services) or it would need to fit with functional economic spaces such as travel to work areas (or small town economic zones in rural areas).

5.4: Service deserts and the residential (local) economy

> *"[the current IMD contains] no measure of local authority services/impact of austerity which is fairly key to community businesses". Workshop 1*

The availability of services within an area has been already specifically mentioned as a 'rural' dimension of disadvantage (although this is not to imply it is an exclusively rural dimension) in Section 5.1. The presence or absence of services in an area is also part of the local economic context for investing in community businesses (see Section 5.3 on local economic context) in that it is both an opportunity (the need for a local shop) for community businesses but it can also be a constraint (the absence of business support services).

Currently the English IMD does have a dimension that relates to a basket of services of general economic interest for residents: this is measured in terms of road distance to post offices, food shops, primary care practices (GPs) and primary schools. In the English IMD system these distances are measured as road distances and there is no differentiation in relation to different types of transport. In contrast, in the Scottish IMD, distances by public transport are also taken into consideration. Accessibility to services is generally important in rural areas (following on from Section 5.1) but not always. For example, Higgs and Langford (2013) investigated access to post offices in Wales for elderly customers and found little difference between urban and rural areas although there were problematic issues of access to different types of service. Comber et al. (2012) looked at perceptions of dissatisfaction to access to libraries and post offices in Leicestershire and found although there was a general relationship between distance and dissatisfaction, in the case of post offices the rate of increase in dissatisfaction varied considerably for different social fractions and in different parts of the county. So physical accessibility is not just an issue that is of concern to people living in rural areas.

Measuring the sufficiency of the service offer in a locality is more complicated than just the time it takes to travel to the nearest point of service. For example, Shaw (2006) investigated the issue of access to food shops in a study of 'food deserts' in the UK. Shaw identified different types of 'food deserts' that related to three concepts of accessibility: ability (anything that might prevent access even if you have the resources), assets (anything that would prevent you from buying food that you can get to and that you would like to eat) and attitude (anything that would stop you eating food that you can get to and can afford to buy). Thus, the presence of a food desert did not just emerge because of the time to travel to a food shop (ability dimension) but it was also mediated by the quality of that food shop (relative to what consumers might buy) as well as the preferences of the consumer. This notion of measuring accessibility and service quality relative to expectations is extremely difficult and goes beyond how access to services is currently conceptualised within the English IMD system.

Finally, we can consider whether accessibility (in any of its definitions) is being related to the most appropriate bundle of services. Currently the English IMD includes road distances to post offices, food shops, primary care practices (GPs) and primary schools as we have noted above. On the whole there is a strong correlation between distances to these four types of services, but the question arises as to whether this is the most appropriate bundle of services to be included. This is an issue that has been subject to review. Table 7 summarises the findings of the review team in 2014 when they considered adding three new types of service to the IMD system: access to childcare services, access to broadband (allowing for the dematerialisation of some services); and fuel poverty as a measure of access to services relating to the 'asset'-based dimension of accessibility for energy services.

Table 7: Issues explored in last review of English IMD system relating to access to services (from CLG 2014)

Issue explored in 2014	Why might be important?	Why not included (CLG 2014)
Access to childcare under geographic barriers	Access to childcare services important as a constraint on entering labour market	Robust data not currently available without significant extra work
Access to digital services	Broadband access seen as constraint on rural economy	Broadband speed per se is not a generalised measure of deprivation and "not conditions just experienced by a small number of people or areas"
Households in fuel poverty under environmental quality	Certainly, an issue of asset-based service access when a household is unable "to have adequate energy services for 10 per cent of income" (after Boardman 2010)	"the methodology used [to generate current data] does not produce robust estimates at very low-level geographies" (CLG 2014, p44)

Thus, in terms of measuring accessibility, the most likely way forward would be to include accessibility by public transport as well as looking at shortest road distance and assuming car transport. Asset-based accessibility might be incorporated combining geographic barriers dimension with the income dimension of the current IMD. We will explore ways of using the full functionality of the current IMD going beyond the top-line indicator value in Section 6.

5.5: Capturing environmental quality

Power to Change includes environmental improvements as an outcome of investing in community businesses although there is not a clear definition of what is meant by environmental improvement. Environmental quality is currently measured within the English IMD as a combination of air quality and of road traffic accidents. Including a more comprehensive measure of environmental quality has been constrained both by a clear definition of what environmental disadvantage might mean and by the lack of data that is available and meaningful at neighbourhood level.

Fairburn et al. (2016) outline how the environmental dimension has been incorporated in the UK nations' indices over the past 20 years but this remains limited. Currently the Welsh index is the most advanced including variables for air quality, proximity to 'emissions sites' and risk of flooding. Risk of flooding was rejected as a possible variable to be included in the English IMD in 2014 because data for England (measured by the Environment Agency) only measured the risk of flooding rather than the incidence of flooding in a given area (CLG 2014). It is difficult to understand the logic of the Project Group given that risk of flooding is a characteristic of environmental location currently (living in a high-risk area comes with higher insurance premiums for example) but also given the likelihood of climate change, it is useful to plan future investments to be at a lower risk of flooding in the future.

There is research on measuring environmental quality in terms of environmental risk to the people that live in an area. This work is covered by researchers working on the theme of the adaptive capacity of communities (to environmental risk) (see Engle 2011) or on community vulnerability to environmental risk (see Cutter et al. 2008). These latter assessments do relate to broader measures

of social and economic advantage that attempt to measure the social cohesiveness of communities (see Section 5.2) as well as measuring environmental risk. It is however difficult to establish appropriate proxy measures based on existing secondary data sources to create such indicators that often rely on primary data collection (for example through surveys) in limited case study areas.

The relationship between community businesses and a better quality environment is complicated in the absence of clear consensus of either what a good quality environment is or what constitutes a sustainable outcome. In Power to Change's hypotheses of community business impact (Power to Change undated), sustainability is interpreted in economic terms alone (the capacity of a business to survive and flourish) rather than in environmental terms (do community businesses facilitate low carbon lifestyles or higher levels of biodiversity for example). It is certainly plausible that by building social cohesion and social well-being place-based communities become more resilient to external shocks – be that environmental, social or economic. Although currently we lack a basic model of how social and economic indicators would combine with environmental indicators to generate a measure of vulnerability (see King and MacGregor, 2000). As we have seen in Section 5.2, there is very little available data at neighbourhood level to make sense of community resilience in the face of environmental hazards.

5.6: Extending and complementing the English IMD indicator system

This Section of the report set out to explore how the existing IMD indicator systems might be extended in relation to five issues:

- Measuring rural-specific disadvantage;
- Measuring social and personal well-being;
- Measuring local economic conditions (constraints and opportunities);
- Measuring access to services; and
- Measuring environmental quality (and community resilience to environmental hazard).

Table 8 summarises our findings in relation to these dimensions that Power to Change participants had found to be inadequately covered in workshop 1. Of the five 'gaps', the issue of rural disadvantage is the issue that is probably best covered in the existing IMD system. There is little evidence of a need to find new data for rural disadvantage although there is a clear case of using the full flexibility of the existing IMD system to represent and identify rural disadvantage.

Access to services is a dimension that has good coverage within the existing IMD system. Whereas the existing IMD does adopt a highly simplified measure of access to services, there is scope for refining the measure of accessibility to public transport and to a broader range of services. However as it currently stands the most significant area of improvement is to build a specific indicator bundle that raises the importance of access to services (and we pursue this in Section 6). Equally the addition of a flood risk variable could be combined with income ranking to explore environmental vulnerability building on the existing IMD data set.

Filling the gap identified in relation to local economic conditions is problematic because of identifying an appropriate geographic scale. There would be much scope to develop a set of indicators at local authority level that would explore the local economic conditions for community businesses. This would draw on data on the local economic structure of the wider area and could be supplemented through a survey of local authority support services for community businesses (and business in general). For the most part, the English IMD indicator system does not address place-

based disadvantages that flow from either the state of the local residential economy or from the state of social infrastructure. Equally the IMD indicator system has not been conceptualised with the specific relationship between community entrepreneurship and 'making better places' in mind. Thus, the English IMD system is inappropriate as a stand-alone means of identifying places that are either vulnerable to cuts in social infrastructure, services of economic interest or private sector parts of the residential economy.

Table 8: Dealing with differences between the IMD indicator system and disadvantage relating to the work of Power to Change.

Form of area-based disadvantage	How is disadvantage defined/ conceptualised?	Examples of 'good practice' for inclusion in an area-based measure	Does IMD plausibly represent form of disadvantage?
Rural disadvantage	Requires some measure of distance and connectivity.	See access to services below	The geographic barriers dimension is a plausible dimension relating to rural disadvantage
Personal and social well-being	Experiencing social isolation, wrong type (or absence) of community cohesion	Some synthetic measures derived from survey data (Social Life)– measure more reliable at local authority level	Not incorporated in IMD as it currently stands due to lack of robust neighbourhood-level data
Local economic conditions	Poor access to input factors for starting a business/ running a business	Wong (2002) indicators but applied to local authority areas – invalid at LSOA level	Need to develop a specific set of indicators at higher-level geographies (e.g. local authority area-level).
Access to services	Being unable to access basic services (SGEI) and social infrastructure	Scottish IMD includes access to services by public transport – no examples of including 'quality of services' Fuel poverty indicators developed but not used in sector	Includes access to a range of SGEIs but does not deal with economic accessibility or service quality issues – can be developed within existing IMD system
Environmental quality (and vulnerability)	Can be conceptualised as 'access to good quality environment' (distributive dimension). Or measured as environmental vulnerability	Welsh IMD includes flood risk and pollution sites	Some distributive dimension with air quality but no measure of quality/quantity of environmental capital (that might relate to community ownership). No means of generating an environmental vulnerability indicator to date

The most difficult to fill gaps in the current IMD system relates to personal and social well-being. Despite the United Kingdom statistical agencies being leaders on the measurement of personal and social well-being at a national level, there is no robust data available at neighbourhood level to combine with the IMD indicator system. Where there is neighbourhood level data, it is not directly measured (it is 'modelled') and so is problematic for the spatial targeting of resources.

6.0: Measurement solutions for identifying area-based disadvantage

We have reviewed how the English IMD is constructed as well as identifying areas that might be better conceptualised using the existing indicator system and where the IMD indicator system is missing concepts that are important to Power to Change. In this Section we want to:

- explore specific proposals for Power to Change to use the full flexibility of the IMD indicator system;
- consider how the existing IMD indicator system might be extended using additional data; and finally,
- outline a research agenda for better understanding the place-based benefits/opportunities of investing in community businesses.

As well as measuring the merits for these solutions to face up to the measurement challenges in relation to understanding disadvantage as it relates to the business of Power to Change, we also want to evaluate the options relative to three operational issues:

- How would it help add insight to the context for community business for Power to Change?
- How easy would the solution be for community leaders to use (for example in their funding application process)?
- How would the options assist either spatial targeting or programme evaluation?

6.1: Using the full flexibility of the existing IMD system

The English IMD indicator system has been conceptualised to be flexible. The IMD was designed to capture a generalised sense of area-based disadvantage (see Section 3). However, it has always been possible to re-construct an index that is better suited to a specific context (see Appendix F - Smith et al. 2015) through using a bespoke selection of the existing dimensions included within the indicator system. The aim of this Section is to demonstrate the practical significance of adopting a bespoke indicator constructed from a selection of IMD dimensions.

Section 4 sets out how Power to Change is particularly interested in rural areas and Table 5 matches the stated intended outcomes of Power to Change's work against the dimensions of the English IMD. From the review of Power to Change's priorities it has been clear that both rural forms of disadvantage and access to services (as an opportunity for community businesses) are important to the work of Power to Change. As an illustrative example, Table 9 outlines how two potential bespoke indicators might be constructed to better reflect the intended outcomes for Power to Change. The first column identifies the dimensions that most relate to a measure of asset-based accessibility (combining physical accessibility and a measure of ability to buy a service/access to a service – see Section 5.4 for discussion). The second column builds an indicator based on the analysis in Table 4 taking the dimensions of Power to Change's 'better place' that are captured within the existing IMD system. Given the stated importance of rural disadvantage we have also selected the weighting on access to services that is used within both the Welsh and Scottish IMD systems (i.e. a weighting of 10 rather than 4.5 on geographic barriers – see Section 5.1 for more detail). However not all dimensions of the IMD indicator system are used to calculate these variant indicators. Where a dimension of the existing IMD system is to be excluded it is marked as not applicable (n/a).

Table 9: Revised index calculation relating to Power to Change special variant indicators

Description of domain/sub-domain	Asset-based accessibility to services	Power to Change 'better places' indicator
Income deprivation	22.5	N/A
Employment deprivation	N/A	N/A
Health deprivation and disability	N/A	13.5
Education (qualifications and attainment)	N/A	13.5
Crime	N/A	N/A
Geographical barriers – distances to services	10	10
Wider barriers – housing affordability	N/A	N/A
Indoors living environment – housing quality	N/A	N/A
Outdoors living environment – traffic-related	N/A	N/A
Total of weights	32.5	37

Figures 5 to 8 map the indicators set out in Table 9. The figures focus on two areas of interest to Power to Change: the Greater Liverpool city-region and Suffolk county council area. Figures 5 and 7 map the patterns of disadvantage in the Greater Liverpool city-region whilst Figures 6 and 8 both focus on Suffolk. Each figure includes three maps: the first map shows the pattern of disadvantage in relation the overall English IMD index; the second map shows the pattern of disadvantage in relation to one of the new accessibility indicators set out in Table 6 and the third map sets out the spatial implications of adopting the accessibility-related indicator. In this third map, the criteria for 'disadvantage' is for an area being included within the 30% most disadvantaged LSOAs in England. Areas in red are those that would be considered in the 30% most disadvantaged with both the original IMD as well as the accessibility indicator. For our purposes, areas marked in orange are of particular interest because these are areas that are indicated as disadvantaged under the accessibility-related indicator but not under the general IMD indicator.

In the case for Greater Liverpool city-region the spatial impact of using the accessibility indicators to target disadvantaged areas is relatively minor. The most disadvantaged areas under the general IMD indicator are similar to those indicated as disadvantaged under the accessibility-related indicators. However, for Suffolk there is a significant change in the framing of disadvantage once the importance of accessibility is enhanced. Much of the county is coloured orange as the disadvantage rankings relating to accessibility are very important for rural areas.

Figure 5: Mapping an indicator of asset-based accessibility disadvantage in the Liverpool city-region[2]

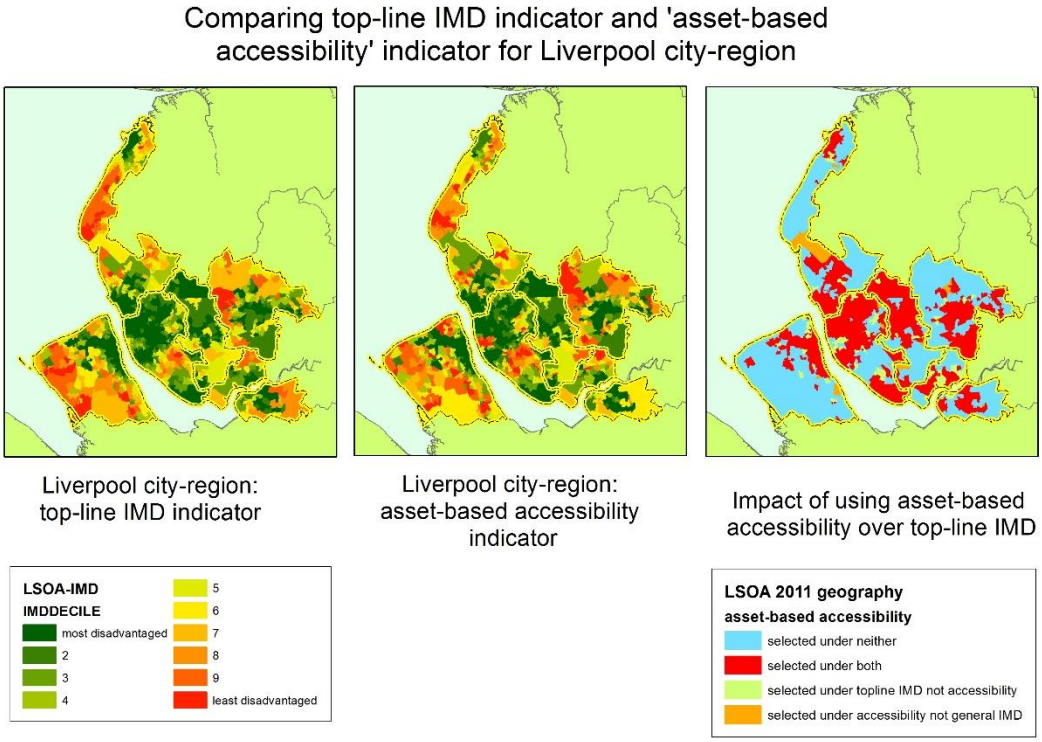
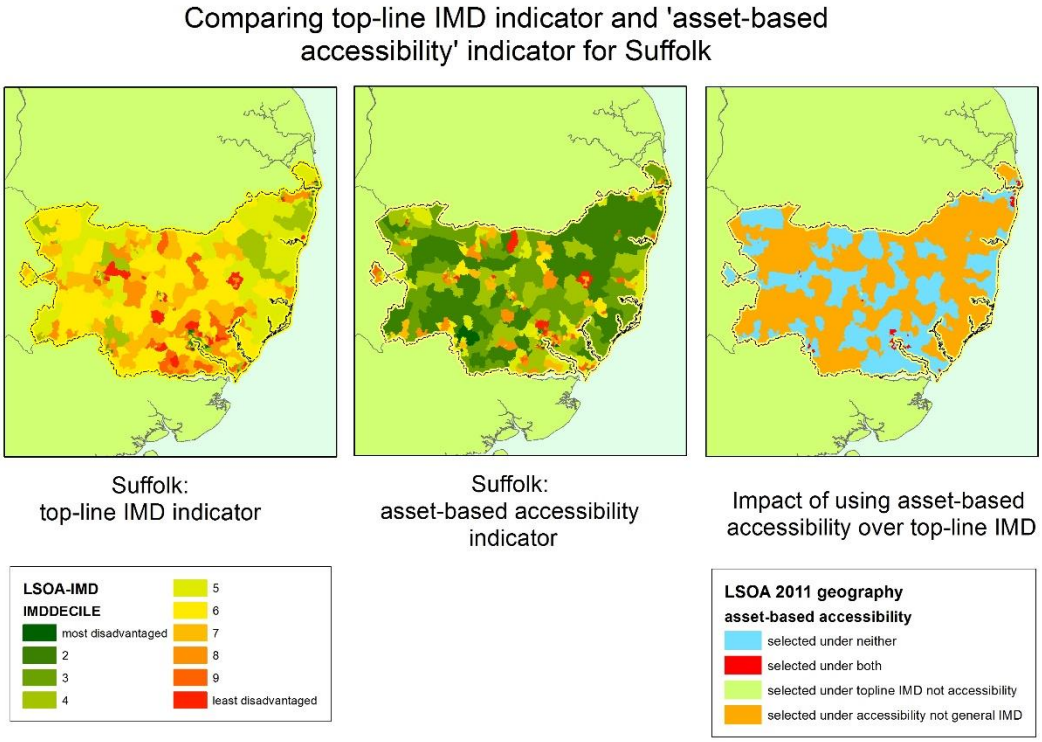


Figure 6: Mapping an indicator of asset-based accessibility disadvantage in Suffolk [2]



[2] Contains public sector information licensed under the Open Government Licence v3.0.

Figure 7: Mapping the Power to Change 'better places' indicator: Liverpool city-region[3]

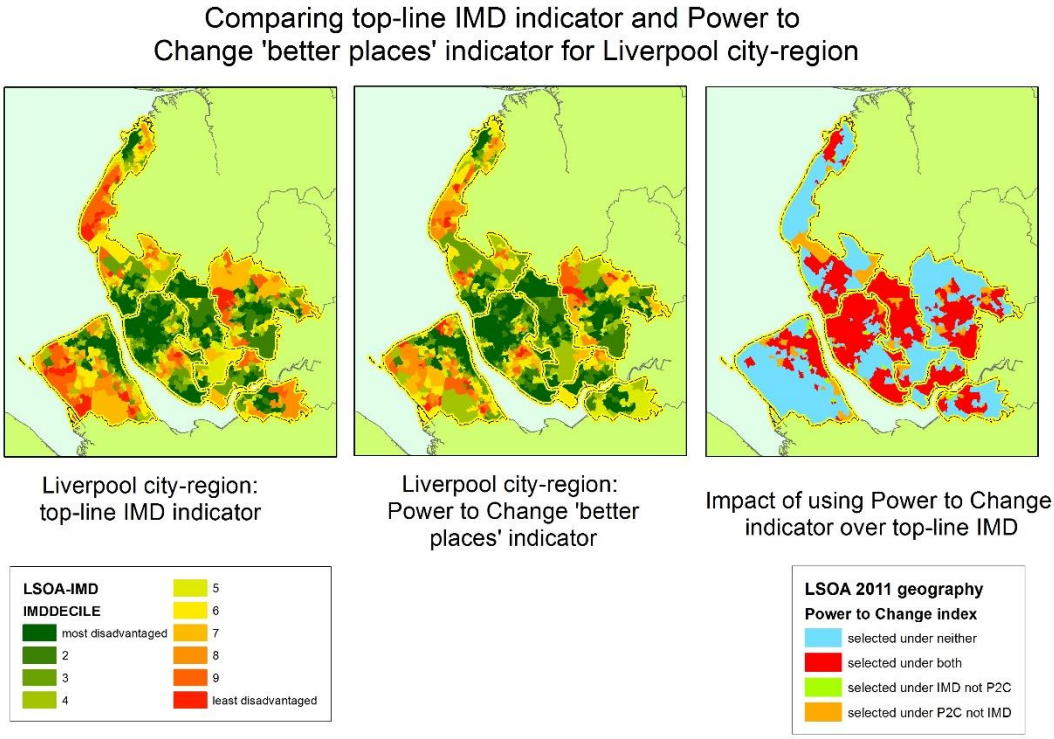
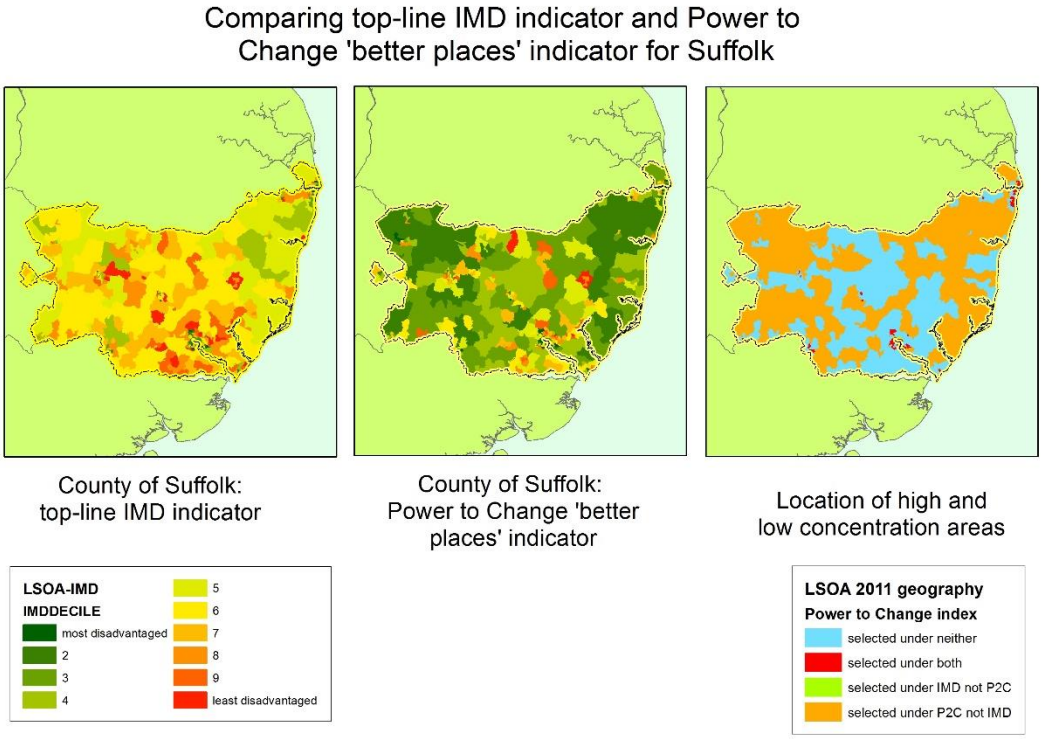


Figure 8: Mapping the Power to Change 'better places' indicator: Suffolk [3]



[3] Contains public sector information licensed under the Open Government Licence v3.0.

Table 10: Impact of changing indicator in terms of population for selected areas

	Asset-based accessibility indicator ('000s)			Power to Change 'better places' indicator ('000s)		
Total population residing in areas:	Suffolk	Liverpool city-region	Rest of England	Suffolk	Liverpool city-region	Rest of England
not selected under either IMD or accessibility indicator	423.6	665.6	32,688.2	403.4	611.7	32,267.6
selected under both IMD and accessibility indicators	86.3	670.7	11,923.0	102.5	731.6	11,144.2
selected under general IMD not accessibility	26.1	100.9	3,395.7	9.9	40.0	4,174.5
selected under accessibility but not general IMD	132.2	16.0	3,305.7	152.5	70.0	3,726.4
Totals	668.3	1,453.2	51,312.6	668.3	1,453.2	51,312.6

Table 10 considers the impact of using these bespoke indicators to target disadvantage in comparison to the top-line IMD indicators in terms of population numbers; it shows the target areas of Suffolk, Liverpool city-region and the rest of England.

Looking at the figures for England, the change in indicator does re-distribute the proportion of population that is included as living in a disadvantaged area in both cases. In the case of the asset-based indicator 3.3 million people in England who would be considered as disadvantaged under the general IMD would not be considered disadvantaged under the accessibility indicator without changing the material quality of life of those residents. An additional 3.3 million residents would be considered to be living in a disadvantaged area under the asset-based accessibility indicator that would not be living in an area disadvantaged under the general IMD.

However, in the case of Suffolk, it can be argued that increasing the importance of accessibility (either in combination with income or in combination with education and health) brings in an additional 100,000 people into the category of living in a 'disadvantaged' area. In the case of Liverpool city-region, even though there appears to be little spatial effect of the change of indicator, some 80,000 fewer residents would be deemed to be living in a disadvantaged area if the criterion combined asset-based accessibility and 30,000 more if using the Power to Change 'better places' indicator combining health, education and accessibility.

In conclusion it is worth Power to Change considering the use of an accessibility-specific version of the IMD that would have the effect of both bringing in a larger population as living in a disadvantaged area as well as better reflecting the dimensions of disadvantage on which Power to Change are trying to have an impact.

6.2: Extending access to data to cover complementary issues on disadvantage

As well as working with the current IMD dimensions to make the indicator system work better for a specific set of outcomes, it is also possible to think about how to extend data coverage. It is clear from Section 5, that the domains of well-being, business environment, access to services and environmental quality are not currently included in the existing English IMD indicator system in any great depth (at lower-level geographies such as neighbourhoods) due to the absence of robust data.

However, there is a wider range of secondary data available for project promoters to use that might cover census characteristics (for example). Such services might be categorised as one of two types: services that emphasise user-friendliness and a non-technical user group; and services that assume basic analytical skills (such as statistical skills) in advance of using the service. If the aim (consistent with Power to Change's general mission) is to make resources available for community leaders, then it is important to outline the key characteristics of such as services as:

- It needs to make secondary data easily accessible to community leader users (good labelling and explanations) via a web-based service (for accessibility);
- It needs to allow community leader users to map the data (and ideally compare different areas and different levels of area);
- It needs to allow users to present data usefully;
- It needs to allow users to compile their own data-sets and include them in their analysis;
- It needs to support user's engagement with the service/data.

The issue of secondary data in the late 2010s is not one of absence. There is a lot of data that is made available for free via the Office for National Statistics (https://www.ons.gov.uk/) or via government constructed search sites for data (see https://www.gov.uk/government/organisations/office-for-national-statistics). The problem becomes one of finding the right data of an appropriate quality (and provenance) for people whose primary job is not to keep track of data availability. Thus, there is the need for intermediary organisations and services that can do some of the sorting and quality assurance work before end users (such as community leaders) consume and use the data. An example of such an intermediary service is the Local Insight data and mapping service (see https://local.communityinsight.org/). The contents of the Local Insight data base (checked June 2018) are outlined in Table 10. For an annual fee, community groups can access and map just under 900 variables. These variables include all the dimensions of the English IMD. The Local Insight data resource would allow leaders to map the variables of choice (and create bespoke geographic areas of interest – for example market areas for their business proposal). It allows leaders to create their own data-sets and upload them into the database. Other services may be available but local insight is used for illustrative purposes.

Table 10 is based on a simple thematic coding of the variables (some variables could be classified under more than one heading). Under the theme of accessibility, the Local Insight data-base does include data on travel times to key services, broadband speeds and accessibility to financial services (from 2010) as well as estimates for energy consumption (that might be used in building a case on accessibility to energy services). The data base covers some of the issues relating to business environment in terms of business start-ups and funding via the Big Lottery fund. Under well-being there is the data (at local authority level) relating to personal well-being. The data-set al.so includes the three synthetic (predictive) variables relating to community cohesion at neighbourhood level

that have been derived from some relatively small-scale survey data - but this would need to be used carefully, as indicated above in Section 5.1.

Table 11: Variable themes available within Local Insight data system

Variable theme (author derived)	Number of variables (in database) by variable type		Totals
	Directly measured variable	Derived variables	Totals
related to accessibility	42	7	49
related to business environment	61	3	64
related to crime	15	2	17
related to demography	225	27	252
related to employment	81	4	85
related to environmental issues	3	9	12
health-related	136	9	145
housing related	88	19	107
about qualifications and skills	41	9	50
Income	53	9	62
multi-dimensional poverty measure	1	19	20
well-being	26	3	29
Total	772	120	892

6.3: Further research to understand relationship between community business investment and place-based disadvantage

Building bespoke indicators within the existing IMD indicator system or extending insight by combining with additional data (available for example through Local Insight) would deal with some of the problematic issues raised by Power to Change participants in this study.

Reflecting on this review the most significant research gaps relate to:

- Identifying the conditions that support community businesses to flourish (building on the work of Wong 2002)
- Measuring vulnerability of communities to current and future environmental hazards (building on the work of Cutter et al. 2008 or King and MacGregor 2000)

In addition, we would recommend that Power to Change need to develop their evaluative framework. To build such a framework it will be important to understand the theories in action of community business leaders in how they relate to (and create impact in) different place-based and networked communities (for example building on the work of van Ham et al. 2017). Scoping a research agenda on this much broader issue was beyond the brief of this project albeit that evaluating the impact of community business investment using the IMD indicator system or the complements recommended in this report would be beyond the reasonable capacity of the data we have discussed.

6.4: Summary of recommendations

Table 11 summarises the three areas of recommendations against operational criteria for Power to Change. These recommendations are neither mutually exclusive nor mutually dependent. But the options outlined in Table 11 relate to:

- Using the full flexibility of the English IMD indicator system;
- Extending the coverage of the English IMD indicator system in portfolio applications by using additional secondary data-sets (mediated via a data service);
- Doing additional research to extend the English IMD through the addition of dimensions.

Table 11 also considers how each of these options might score against operational considerations relating to:

- Extending value from the existing IMD indicator system
- Costs of implementation
- Capacity to map disadvantage
- Ease of use/access by community leaders

Table 11: (Non-mutually exclusive) research options for Power to Change in relation to area-based measurement

Operational consideration	Option 1 Re-working the IMD indicator system	Option 2 Buying access to locality data-service	Option 3 Funding further research
Understanding a general notion of deprivation	Helps focus the IMD onto the priorities of Power to Change	Permits community leaders to represent disadvantage that matters to them	Extends our understanding in the relationship between community business and deprivation
Complementing existing IMD system	Does not extend the IMD system	Good for extending to specific measures identified by community leaders	Potentially adds missing dimensions (that matter to Power to Change)
Costs associated with option	Very low cost – we have constructed some alternatives already	These services come with a subscription charge	Variable – depending on the scope of research
Good for spatial targeting or evaluating impact	Spatial targeting	Spatial targeting – the service needs to come with mapping functions (including bespoke mapping)	Evaluating impact
Capacity to deal with different geographies	Yes	Yes (also including IMD) – also possible to construct new areas of interest	Capacity to understand impacts of differing (intersecting) geographies
Potential ease of use by community leaders	Would need software skills	Service would need to support non-specialist users and have a user-friendly interface	Could be constructed as a collaborative enquiry with community businesses

The option to use the full flexibility of the IMD indicator system is the most cost-effective option. This report provides examples of how this might be done (see Section 6.1) as well as the implications of using only the dimensions of the IMD that directly relate to the priorities of Power to Change. Using a bespoke IMD indicator that gives greater emphasis to access to services is especially significant for rural areas (such as Suffolk). It acknowledges the existing value and good practice of the IMD but uses this resource in a targeted way that also acknowledges the mission of Power to Change.

Extending the range of secondary data resources through which community leaders can justify their proposals might be important if Power to Change wanted to help co-create maps of disadvantage with community leaders. It would acknowledge that the English IMD indicator system is part of a portfolio of identifying area-based disadvantage but it would allow community leaders to explore supplementary ways of representing this disadvantage. To make this a possibility for a range of community leaders, there are advantages in using online data-bases that would permit community leaders to map and represent area-based data. The key criteria for such as service should be use-ability and the service would need to play the role of cleaning up and packaging the data for use by community leaders. These services generally come with a subscription charge. This would be most useful where community leaders would want to extend the range of service-based disadvantage (such as broadband accessibility or access by public transport) or to extend the range of demographic characteristics to be included.

In Section 5 we identified two particular areas of disadvantage for which data is available but for which there is a need to synthesise indicator dimensions: these related to local economic conditions and to environmental resilience. Including these aspects goes beyond simply adding an additional variable. The third column of Table 11 relates the likely implications of doing more data-work in relation to these dimensions. In particular we would suggest that these areas are most fruitful for not only targeting areas for community business investment but also exploring the relationship between community businesses and their wider context. A better understanding of the local economic precursors for community business success and support would assist the broader mission of Power to Change. Equally more research on the role of community businesses in building environmental resilience and reducing environmental vulnerability would demonstrate the wider value of investment in the sector. This would extend the Power to Change hypothesis that community businesses build economic and social resilience within the communities in which they are located.

7.0: Recommendations for evaluating area-based disadvantage that relates to supporting community businesses

The English IMD indicator system is an example of good practice for what it does but it is not perfect: an over-reliance on the top-line IMD indicator is problematic especially when working in a specialist field such as investing in community businesses. Power to Change are not currently maximising the value of the IMD indicator system in relation to the specific objectives of the organisation. We strongly recommend that Power to Change engage in an organisation-wide discussion on making better use of a good and useful resource. This needs to extend beyond staff members to all people involved in evaluating funding bids. This report includes examples of how the IMD indicator system can be justifiably tweaked to more closely align with the stated objectives of the organisation's work with community businesses. The examples we developed (and can provide data for) relate to asset-based accessibility and a Power to Change 'better places' indicator.

Constructing area-profiles for flexible geographies and for a range of themes using publicly available data and flexible boundary setting can be achieved in partnership with community leaders through the use of existing web-based data resources. Based on an annual subscription a web-based mapping and data visualisation tools can help community leaders define the problems and opportunities they are setting out to resolve. This is potentially an important step in engaging community businesses in evaluating the impact of what they are doing. We recommend that a trial subscription is taken out with Local Insight to test whether community leaders are prepared to engage with it.

In terms of developing further work to better target investment in community businesses, we recommend two priority areas:

- Measuring the conditions for community businesses – including the support available via local authority and LEP-funded business service units building on the work of Wong 2002.
- Explore the construction of an environmental vulnerability indicator that incorporates flood risk building on the work of King and MacGregor (2000).

These are areas that are not currently incorporated within the existing IMD indicator system but would be important for better targeting efforts either to build a supportive environment for community businesses or for building a plausible theory of change whereby investing in community businesses has an impact on issues related to environmental quality.

There is much we do not understand about the interactions between community businesses and the multiple communities of place and practice in which they are situated. This more detailed understanding clearly extends beyond the need to identify geographic areas in which to invest in community businesses to the need to evaluate the impact of community businesses and to better understand the dynamic of this diverse sector. Evaluating the impact of investment in community businesses stretches beyond the reasonable and plausible value of IMD and IMD-related indicator systems. In order to build an evaluative set of indicators we would recommend Power to Change to focus on a qualitative and collaborative research with community businesses to establish how they impact different communities of place and practice building on the work of van Ham et al. (2017).

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